“HELL WITH THE LID TAKEN OFF:”
A CULTURAL HISTORY OF AIR POLLUTION – PITTSBURGH

A Dissertation

Submitted to the Graduate School
of the University of Notre Dame
in Partial Fulfillment of the Requirements
for the Degree of

Doctor of Philosophy

by

Angela Gugliotta, B.S., M.A., M.A.

Christopher Hamlin, Director

Graduate Program in History
Notre Dame, Indiana
December 2004
“HELL WITH THE LID TAKEN OFF:”
A CULTURAL HISTORY OF AIR POLLUTION – PITTSBURGH

Abstract

by

Angela Gugliotta

Pittsburgh has been known for coal smoke since its founding. Yet no comprehensive study exists of the meaning of smoke to the city. Urban pollution is usually discussed in terms of problem and solution. Such narratives seldom do justice to the mixed losses and benefits inherent in historical outcomes or to the ambiguous motives and capacities of historical actors. This dissertation asks when, for whom, and why smoke became a problem in Pittsburgh. More broadly, it examines the rich variety of roles smoke played in urban history.

Pittsburgh began as a frontier settlement. The smoky spectacle described in travelers’ accounts advertised its abundant coal and industrial promise. Valued for economic potential rather than civic culture, Pittsburgh’s future seemed precarious. Environmental sacrifice shored up its uncertain prospects.

Nuisance judgements and local newspapers characterized opposition to smoke as a threat to economic necessity – arising from luxurious and vicious tastes of coddled and
Angela Gugliotta

feminized elites. By the 1880s technological changes, especially the introduction of natural
gas, broke connections between particular production processes and economic success. For
skilled workers of Pittsburgh’s National Labor Tribune, and their employers, values like
cleanliness, previously regarded as antithetical to industry, became supportive of it. Natural
gas made better steel, iron and glass than bituminous coal. Changes in class structure and
social geography encouraged elites to reject provincialism and frontier exceptionalism.

From the 1890s on, interest in economic diversification justified smoke abatement
through values formerly seen as threats to economic welfare: leisure, consumption, and
domesticity, embodied in real estate and retail commerce. The Mellon Institute Smoke
Investigation and its successor studies (1911-1941) exhibit the interplay of such interests
with changing environmental, scientific and reform orientations. Despite such sustained
efforts, environmental attitudes fluctuated as depression and defense industry booms
reshaped civic hopes and fears.

Architects of Pittsburgh’s mid-twentieth century “Renaissance” would construct the
previous 150 years as an environmental Dark Age. Yet, Pittsburghers had no more
passively accepted smoke than they had unanimously resisted it. Throughout the period,
smoke had been put to varied political uses, serving diverse and shifting constituencies,
shaping and shaped by Pittsburgh’s social and cultural history.
DEDICATION

For Roswitha, Teresa, and Lucia
CONTENTS

ACKNOWLEDGMENTS ................................................................. vii

INTRODUCTION ................................................................. 1
Notes ................................................................. 13

CHAPTER 1: SMOKE ON THE URBAN FRONTIER ......................... 17
1.1 Advantages ................................................................. 19
1.2 Smoke and Health on the Frontier .................................. 31
1.3 Instability and Industrial Growth .................................... 37
1.4 Dissonance ................................................................. 50
1.5 Frontier Ideology .......................................................... 67
Notes ................................................................. 72

CHAPTER 2: SMOKE’S REPUBLIC TO “NEW PITTSBURG,” 1868-1892 81
2.1 “Smoke;” That Single Word ........................................... 81
2.2 City of Smoke ............................................................... 84
2.3 Jarring Transformations: Rivers to Railroads, Commerce to Industry, Iron to Steel ........................................... 90
2.4 Pittsburgh as Craftsmen’s Empire: Labor Struggles and Republican Ideals ................................................................. 94
2.5 New Technology and Republican Ideology ....................... 96
2.6 Demise of the Walking City: Fragmentation of the Urban Republic ......................................................... 99
2.7 Smoke in James Parton’s Frontier Republic ...................... 102
2.8 Technological Change and Transformed Meanings of Smoke .... 121
2.9 Skilled Labor On the Natural Gas Supply: A Defense of Republican Entitlements ......................................................... 132
2.10 The Wells Run Dry ....................................................... 140
2.11 Natural Gas Deconstructs the Mythology: an Odd Anti-Smoke Consensus ......................................................... 143
2.12 Experiments with and Rejection of Manufactured Gas ........ 151
### CHAPTER 3: SMOKE ABATEMENT ACTIVISM AND PROGRESSIVE REFORM, 1892-1911

3.1 Residential Segregation, Cultural Fragmentation and Municipal Housekeeping .................................................. 179
3.2 Municipal Housekeepers: The Ladies’ Heath Protective Association – Motives and Identity ........................................... 183
3.3 The LHPA’s Anti-Smoke Campaign and the Engineers’ Society of Western Pennsylvania ............................................. 190
3.4 Smoke, Health, Luxury and Necessity .................................................................................................................. 199
3.5 Newspaper Representation of the Meeting: “Strongly Smoke” ................................................................................ 206
3.6 Opposition to Smoke Abatement: In Like a Lion and Out Like a Lamb ................................................................. 210
3.7 Legislative Action on Smoke ..................................................................................................................................... 217
3.8 Enforcement of the 1892 Ordinance ..................................................................................................................... 230
3.9 Andrew Carnegie and William Metcalf: Coal, Smoke and Pittsburgh’s Future ......................................................... 240
3.10 The Chamber of Commerce Committee on Smoke Abatement ............................................................................. 247
3.11 Early Claims of Progress and Consensus: The Joke that Wasn’t Funny Anymore ..................................................... 252
3.12 Overturning of the 1895 Ordinance .................................................................................................................... 263
3.13 The Struggle for Oakland: Nuisance Suits Against the Junction Railroad and Jones and Laughlin ......................... 266
3.14 Progressive Reform in Pittsburgh and The Crusade of the Pittsburgh Sun .......................................................................................................................... 282
3.15 Comfort and Cleanliness As Legitimate Values in the Sun’s Crusade .............................................................. 285
3.16 Framing a New Ordinance: Pittsburgh’s Mills and Its Exceptional Smoke Problem ............................................. 290
3.17 Drafting the 1906 Smoke Ordinance .................................................................................................................... 297
3.18 Railroads and the Resurrection of Old Ordinances ................................................................................................. 299
3.19 Slow Progress on the Tilbury Bill .......................................................................................................................... 301
3.20 Enforcement of the 1906 Ordinance ....................................................................................................................... 313
3.21 The Pittsburgh Survey ........................................................................................................................................... 317
3.22 Conclusion .......................................................................................................................................................... 327
Notes ........................................................................................................................................................................ 330
CHAPTER 4: SMOKE, INDUSTRIAL RESEARCH, AND VISIONS FOR PITTSBURGH, 1911-1922 ................................................................. 362
  4.1 Counter-Surveys ................................................................. 365
  4.2 The Mellons, Industrial Research, Reform Research and Smoke . . . 368
  4.3 Mellon Industrial Research: Gold From Lead? ........................... 374
  4.4 Psychological Effects ......................................................... 386
  4.5 Economic Cost ................................................................. 389
  4.6 Meteorological Aspects ..................................................... 395
  4.7 Effects of Smoke on Building Materials ................................ 397
  4.8 Effects on Vegetation ........................................................ 402
  4.9 Final Bulletins of Initial MISI Work: Health Effects and Emissions Survey ................................................................. 404
     4.9.1 Health Effects ............................................................ 404
     4.9.2 Emissions Survey and Directives for Action ....................... 415
  4.10 Fruits of Reform Research: Publicity, The Smoke and Dust Abatement League, New Smoke Laws and a New Smoke Inspector ................. 423
  4.11 “War Smoke is not to Envelop Pittsburgh” .............................. 451
  4.12 Interpretations: Insurgency to Efficiency? Environmentalism to Conservationism? ......................................................... 454
  4.13 Conclusion ................................................................. 457
Notes ..................................................................................... 460

CHAPTER 5: DARK AGE TO RENAISSANCE? ................................. 476
  5A The 1920s ................................................................. 480
     5A.1 Owls and Windowboxes ................................................. 481
     5A.2 Overalls or Artist’s Smock? ............................................. 486
     5A.3 “What Kind of a Pittsburgh Is Detroit?” ............................. 488
     5A.4 “Child of Necessity and Nature” ..................................... 490
     5A.5 Smoke Abatement and the Future of Coal ......................... 494
     5A.6 Smoke Abatement After the Great War: Herbert Meller as City Official and Pollution Scientist ............................................. 500
     5A.7 The 1923-24 Sootfall Study: Ambiguous Results ............... 504
     5A.8 Claims of Comparative Success ...................................... 509
     5A.9 The 1929-30 Sootfall Study: Even More Ambiguities .......... 514
  5B The Great Depression ........................................................ 516
     5B.1 Pittsburgh in Depression: Smoke, Steel and Squalor in the National Press ................................................................. 517
     5B.2 The Mellon Machine and the CIO ..................................... 522
     5B.3 The Dignity of Labor and The Drama of Steel – More National Impressions ................................................................. 525
     5B.4 Pittsburgh Writers in Depression: “Our Forefathers Were Pioneers, So Are We” .............................................................. 527
     5B.5 “Industrial Maturity” ...................................................... 536
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5B.6</td>
<td>Pittsburgh in Local and National Narratives in the New Deal</td>
<td>540</td>
</tr>
<tr>
<td>5B.7</td>
<td>The Neotechnic and the Paleotechnic at Mellon Institute</td>
<td>546</td>
</tr>
<tr>
<td>5B.8</td>
<td>“Making a new compass”: Mellon Institute and the Future of Smoke and Coal</td>
<td>550</td>
</tr>
<tr>
<td>5B.9</td>
<td>Hygienically Pure Air</td>
<td>553</td>
</tr>
<tr>
<td>5B.10</td>
<td>“Anthracite’s Epochal Chance”</td>
<td>557</td>
</tr>
<tr>
<td>5B.11</td>
<td>The Air Hygiene Foundation</td>
<td>560</td>
</tr>
<tr>
<td>5B.12</td>
<td>Final Frustrations</td>
<td>563</td>
</tr>
<tr>
<td>5B.13</td>
<td>Reliance on a Weak Argument and a Scaled Down Solution</td>
<td>567</td>
</tr>
<tr>
<td>5C</td>
<td>World War II and After</td>
<td>570</td>
</tr>
<tr>
<td>5C.1</td>
<td>“A haze of new smoke”</td>
<td>571</td>
</tr>
<tr>
<td>5C.2</td>
<td>“Mistake neither a war for a boom, nor the coming peace for a depression”</td>
<td>574</td>
</tr>
<tr>
<td>5C.3</td>
<td>John Wayne as “Pittsburgh”</td>
<td>579</td>
</tr>
<tr>
<td>5C.4</td>
<td>“Pittsburgh’s New Powers”</td>
<td>581</td>
</tr>
<tr>
<td>5C.5</td>
<td>The Shift to “Laborless Fuels”</td>
<td>593</td>
</tr>
<tr>
<td>5C.6</td>
<td>“Pittsburgh comes out of the smog”</td>
<td>598</td>
</tr>
<tr>
<td>5C.7</td>
<td>“Workshop of the Titans” and Alchemist’s Laboratory</td>
<td>604</td>
</tr>
<tr>
<td>5C.8</td>
<td>“Live where you work, work where you live”</td>
<td>606</td>
</tr>
<tr>
<td>5C.9</td>
<td>Assessing the Success of the Renaissance</td>
<td>610</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
<td>614</td>
</tr>
</tbody>
</table>

CONCLUSION ........................................................................................................... 636
Notes ......................................................................................................................... 642

BIBLIOGRAPHY .......................................................................................................... 643
ACKNOWLEDGMENTS

This dissertation was a long time in the making. At first small children and later breast cancer have made its research and writing even more of struggle than they otherwise would have been. Only extraordinary support, from my family, my advisor, my committee and department, and from colleagues in the wider world of urban environmental history made its completion possible.

My work on this topic was first welcomed and supported by David Stradling, who sent me a copy of his recently completed dissertation, and especially, by Joel Tarr. I am sure that the dissertations and first books thanking Joel must number in the hundreds by now. When I became interested in the topic of smoke in Pittsburgh, I sent Joel an email. From that day forward Joel encouraged me to take up work on what, from his several important articles, had become “his” topic. When I went to Pittsburgh to do research in a subsequent summer, Joel shared with me his twenty-five years of collected materials on the topic. Both Joel Tarr and Harold Platt have been extraordinarily generous with their time and attention to my work. I met Harold when I gave my first conference paper, at the American Association for Environmental History in March 1996. Since that time he has always been eager to discuss both my work and larger issues in the field. He has offered much perceptive advice and has created opportunities for me to present my work.
No graduate student could be more fortunate than to have such scholars as supportive senior colleagues and as friends.

My approach to this topic and much of my way of thinking about the world have been shaped by conversations with my dissertation director, Christopher Hamlin. I was not geographically mobile when I entered graduate school, but I am convinced that I would not have found a sharper or deeper thinker, with a basic intellectual orientation more compatible with my own, in any other place. I also am grateful to Chris for helping to bear the burdens imposed by the circumstances under which I have done this work. I thank him for his insight, for his patience, for his hard work and dedication, and for his staunch refusal to let me give up.

The other members of my committee, Walter Nugent, Tom Schlereth, and Gail Bederman, each brought distinctive perspectives to the work. Walter Nugent, in his courses on the West and in my first course covering environmental history, convinced me of the cultural importance of the idea of the frontier and of the West in American life. Tom Schlereth, fellow Pittsburgher, broadened my conception of the kinds of evidence one can use to understand culture, and I hope to follow his example in this regard more closely in the future development of this work. Gail Bederman, from the time I took my first course in women’s history from her, has encouraged me to think about my work with reference to challenges raised by recent cultural history. In addition Gail has been an unfailing personal ally and supporter and has demonstrated concern for my welfare beyond what any student could hope for from a teacher.

If my experience is any guide, graduate students in the History Department at the University of Notre Dame are treated with uncommon humaneness. Beyond this, I know
that the department as a whole has extended to me unaccountable kindnesses. I will always be grateful that my graduate education and the beginning of my professional career had such a department as their setting. I would particularly like to thank Remie Constable, Director of Graduate Studies, for shepherding me through the last few years of dissertation work.

My family has sacrificed significantly in order for me to complete this dissertation, and I hope that they will now enjoy some benefit from its completion. My daughters, Lucia, Teresa and Roswitha were 6, 4 and 2 years old when I began this work. They have put up with my grumpiness and inattention, with numerous periodic dissertation crises, and with Halloween costumes unmade and cruddy dinners for as long as they can remember. This dissertation is dedicated to them. Rosie, the youngest, who probably sacrificed most, gets first billing. I want also to thank those who helped Michael and me to care for them and to feed them during my time in graduate school, especially Deborah Patterson in Decio Commons (who fed them at their home away from home), Terry Kozik and the staff of the Notre Dame and Saint Mary’s Early Childhood Development Centers and our babysitters, especially Lissette Gutierrez, Ruth Thompson, Claudette DeBruin, Julie Schuetz, Michelle Barrett, Lynn Quenan, and Meredith Potempa.

My parents-in-law Elmar and Martha Kremer always encouraged my work even when the end seemed nowhere in sight and the difficulties daunting. My mother, Gloria Gugliotta, always showed interest and expressed her pride in my work – once driving seventy miles on one day’s notice so she could attend a book-signing of a collection in which an essay of mine appeared. As an expression of her pride and interest, she has
provided for me a large library of books and videos on the history of Pittsburgh, coal and steel. Many of these gifts have proven invaluable in my research. Much more than this, though, I could not even have contemplated this work without her lifelong encouragement of my intellectual curiosity and ambition. I would be nothing of what I am without her.

To my husband Michael I owe the deepest debt of gratitude for all he has been for me and given to me in the fifteen years of our marriage, during most of which I have been in graduate school. In the first demanding years of his own academic career, while we could pay for only minimal daycare, Michael split childcare responsibilities with me. His faculty office was full of toys and diapers for a decade and often was shared by the five of us for a good part of each day. He has made similar sacrifices, taking time to care for me, to accompany me to doctors’ appointments and to contend with health insurance companies, in more recent days. If Michael had not made these sacrifices, I would not have had the opportunity to do my own intellectual work, to teach and to publish. Michael has also served as a mentor in my work as a scholar. There is nothing like having a professional model next to you at the dining room computer.

In the final weeks of my work on my dissertation, Michael took over the technical details of the preparation of the manuscript. He became my editor, copy-editor and typist. He worked alongside me (and sometimes even after I was asleep), for twelve to sixteen hours a day to fix typos and margins, put footnotes in the right form and to set up a bibliography. Everything good about the formal state of this manuscript is due to his work.
As much as my own work, this dissertation is the fruit of the many efforts I have described, and I am sure, of many other gifts I have forgotten. I am and will always remain grateful.
INTRODUCTION

This dissertation is a cultural history of the city of Pittsburgh told through changing attitudes toward air pollution. Environmental history is often written as a history of injury to nature accompanied by evaluation of human efforts to perpetuate or put an end to such injury. This is not the story of smoke in Pittsburgh that I intend to tell. Instead, I examine the multiple meanings accorded to smoke by Pittsburghers and by external observers throughout the city’s history. Attitudes toward smoke tell us a great deal about civic self-image. Changes in environmental attitudes reflect important changes in local culture and its relationship to national trends. Mary Douglas has argued that making decisions about what to call dirty or dangerous is a chief way that a culture defines itself. For Douglas, without something to count as pollution, which she defines as “matter out of place” – a culture has no way to draw its boundaries – and therefore ceases to be a culture. This question – of how historical actors used Pittsburgh’s smoke to define the culture of a place – is at the center of the story I will tell.

The conceptual roots of this project, like those of much new work in environmental history lie in the writings of William Cronon and Richard White. Cronon’s Nature’s Metropolis tells the story of a city’s relationship to its hinterland by tracing the history of the processing of parts of Western nature into urban and national
commodities. In his chapter on meat, particularly, he examines how the “logic of
capitalism” alienates humans from the traditional confines of space and time.¹

Cronon’s story, at once, “brings nature back in” to history and looks deeply into
the cultural reshaping of the meanings of the most basic of natural parameters. He does
so by selecting specific parts of nature through which to tell the environmental history of
a city. Elsewhere, in his controversial essay, “The Trouble with Wilderness or Getting
Back to the Wrong Nature,” Cronon urges environmentalists and environmental
historians to turn their attention to the nature inside settings, objects and phenomena we
identify as essentially artificial or, at least, as non-natural according to stringent criteria
of ecological purity. Similarly Richard White in Organic Machine illuminates the history
of the highly artificial Columbia River system by tracing the energy flows important both
in the physical operation of the river and in the history of human conflict on and around
it. White argues that the Columbia can never be made into a wholly mechanical system,
that the irreducibly organic determines even how it will play a role in human history.

Following both Cronon and White, I have undertaken to tell the history of a
particular city by concentrating on a particular pollution phenomenon. Like Cronon, I
examine how ideologies, forms of capitalism, republicanism, Calvinism, Progressivism,
frontier ideologies, New Dealism, among others, have shaped a city by inscribing their
meanings, different meanings in different periods, on a particular material phenomenon –
air pollution or smoke. As Cronon and White urge, the focus here is not on pristine
nature, but on nature inside the machine of an industrial city. White also urges attention
to the human relationship with nature through labor rather than leisure, and pollution
phenomena, as I hope my story will illustrate, can be a key nexus of this relationship. As
much as fire, water, forests, ice, deserts and buffalo, various forms of pollution deserve their own histories.

While environmental history provides much of the conceptual frame for this work, questions arising from other, over-lapping, historical disciplines motivated my initial interest in the project. My initial interests in graduate school were in the history of science, technology and medicine. Early on I became convinced that questions in these disciplines were best addressed within the broader contexts of social and cultural history. The case of air pollution in Pittsburgh presented an opportunity to integrate history of science, medicine and technology with American social and cultural history in a number of ways.

While our own environmental problems may seem obvious sources of political conflict, environmental problems of the past, especially those we have “solved” often seem apolitical, purely scientific and technological – universal, non-local. Yet there is no real reason why the present should be assumed to be so unlike the past. At least, one might ask questions about the relationship between local environmental problems and the science and technology that purport to deal with them. The case of smoke in Pittsburgh offers much material for the study of the construction of scientific knowledge about the environment in a local context. In 1911 Richard B. Mellon endowed a scientific investigation of smoke in Pittsburgh, “The Mellon Institute Smoke Investigation,” which continued through 1914 and was followed by Mellon Institute for Industrial Research “Air Pollution Fellowships” and “Pneumonia Studies” into the 1940s. These studies have left behind both extensive published results and rich archival material. Through study of the Mellon Institute sources I have explored the local construction of scientific
knowledge and the relationship of local and universal scientific contexts. I have also explored the way in which the highly visible Mellon-funded studies shaped and expressed not only the meaning of smoke and air pollution in Pittsburgh in the first half of the twentieth century, but also the image and trajectory of the city itself.

Other questions arise with respect to the Mellon Institute studies that have helped to establish themes for the project as a whole. They concern the definition of smoke and air pollution, and the justifications for seeing these phenomena as problematic. Researchers at Mellon Institute sought to measure the degree and distribution of smoke in the city, but they faced successively more ambiguous results from the various methods they chose. In the end they sought to correlate measurements arrived at by different techniques, but in the process found themselves operationally defining smoke and constructing a new category of problem: air pollution. Researchers also hoped to use science to provide a solid justification for ameliorating smoke and air pollution by definitely establishing them as dangers to human health. Mellon Institute researchers were persistently frustrated in this effort, as the social context of corporate financing of research in the midst of the Great Depression created and exacerbated both practical and conceptual difficulties.

So – this story of smoke in Pittsburgh concerns the relationship of the local and the universal in the scientific construction of environmental problems. It is also, and more fundamentally, about the history of a city that for century and a half, took a pollution phenomenon as its emblem. Pittsburgh was “the Smoky City” by 1800 and persisted in that designation, under growing protest, through the “Pittsburgh
Renaissance” of the 1950s. The social and cultural history of the city of Pittsburgh tells us a great deal about smoke, and smoke can tell us a great deal about that history.

This work would not have been possible without foundational work in urban environmental history by Joel Tarr, much of which focused on the history of air pollution, particularly in Pittsburgh. In particular, his studies of coke oven pollution, efforts to control railroad smoke, and Pittsburgh’s Renaissance smoke control campaigns, provided essential information, illuminating analyses, and a model for emulation.²

Several recent books have focused on the history of coal smoke and coal. David Stradling’s Smokestacks and Progressives: Environmentalists, Engineers and Air Quality in America, 1881-1951 (1999) and Stephen Mosley’s The Chimney of the World: A History of Smoke Pollution in Victorian and Edwardian Manchester (2001), as well as several chapters of Harold Platt’s forthcoming Shock Cities: The Environmental Transformation and Reform of Manchester and Chicago (2005) have set the most immediate context for this dissertation.³ Two books about coal that have garnered significant attention, Rolf Peter Sieferle’s The Subterranean Forest: Energy Systems and the Industrial Revolution (published in German in 1982 and translated into English in 2001) and Barbara Freese’s Coal: a Human History (2003) testify to growing interest in the place of coal and the way of life it helped to create, in our history.⁴ (Freese’s book has even been published in audio-book format.) In addition Devra Lee Davis’s When Smoke Ran Like Water: Tales of Environmental Deception and the Battle Against Pollution (2002), in which she argues historically for greater attention to air pollution as a health threat, has stirred controversy.⁵
The dissertation begins by examining the role of bituminous coal and smoke in Pittsburgh’s very early history. Pittsburghers’ environmental attitudes, and through them, the city’s environment itself, were shaped by frontier ideology and by tensions generated by following out urban ambitions in that context. Some elements of actors’ ideology I examine have echoes in Frederick Jackson Turner and or are discussed by Henry Nash Smith in Virgin Land: The American West as Symbol and Myth. The specific formulation I take to be relevant to Pittsburgh is my own. Richard Wade in his 1959 Urban Frontier described rivalry among frontier cities for economic survival. I trace this process in Pittsburgh and examine the place of smoke and coal in it. Resource richness proximate to the shifting frontier would provide an unstable base for civic identity. Frontier standards militated against the enforcement of traditional urban protections against pollution. Further, smoke, as evidence of abundant coal, grounded predictions of a great industrial destiny for the city.

In the 1830s and 1840s manufacturing intensified and with it smoke levels rose. Pittsburgh’s smoke would come to be associated with urban sins: greed, intemperance, lack of charity. Yet it also symbolized, evinced and enforced virtues of frugality and industry. Smoke was strongly associated with republican ideology in Pittsburgh. Complaints about smoke were seen to threaten sustenance and express a vicious love of luxury, yet attempts at environmental regulation on the city’s ordinance books from 1816 through the 1860s belie smoke’s universal acceptance.

Chapter Two examines changing attitudes toward smoke in the context of related technological and cultural transformations of Pittsburgh in the second half of the nineteenth century. Following Richard White, it focuses on the knowledge of nature
(embodied in coal and smoke) held by workers in Pittsburgh’s iron and steel industries.

In the second half of the nineteenth century, Pittsburgh experienced a number of jarring local transformations. Railroads superseded rivers, steel overtook iron, and petroleum and natural gas temporarily stood alongside coal as Pittsburgh’s chief mineral advantages. Equally jarring social and cultural changes would accompany these technological and industrial ones. These would include the reorganization of the social geography of the city and realignments among categories of work and leisure, health and comfort, consumption and production, and virtue and vice. The use of natural gas between 1884 and 1892 allowed Pittsburghers to see how much their material lives had been shaped by smoke. It broke down the necessary connection between smoke and industry. It also fueled the expansion of aesthetic, domestic, and consumption interests in Pittsburgh just as elite leisure culture in the city expanded and grew less parochial, and as downtown real estate and retail boomed. These factors weakened Pittsburghers’ interests in claiming exemption from widely held civic ideals based on frontier exceptionalism. Samuel Hays in Beauty, Health and Permanence (1987) associates conservationism with “production values” – values important for manufacturing – and environmentalism with “consumption values” – beauty, health, posterity – which became important in the United States only after World War II. Yet in Pittsburgh’s natural gas period, interest in what Hays would want to call consumption values increased. At the same time, the distinction between consumption and production values was blurred because of natural gas’s universally recognized good effects on product quality, working conditions, and on the external environment. Both elites and workers (as is evident in the
pages of Pittsburgh’s National Labor Tribune from these years) linked quality of product, quality of working conditions and quality of the external environment.

Chapter Three explores the reaction of various constituencies to the return of bituminous coal at the end of the natural gas period. Debate over fuels and combustion technologies was integral to intensified debate over civic identity in these years and was linked with emerging fears about the city’s industrial prospects. Reasons for Pittsburgh’s unstable identity are multiple and they reflect an interaction between changing local conditions and national cultural trends. The rise of large batch steel and the 1892 Homestead Strike marked the end of David Montgomery’s “Craftsman’s Empire”12 in Pittsburgh. Strengthened middle class and elite cultures connected Pittsburgh to a number of nationwide phenomena: municipal housekeeping, crusading journalism, the social survey movement and the rising power of retail merchants. In each of these movements smoke took a different position relative to Pittsburgh’s many other urban problems.

Both the experience of the natural gas period, and the middle class response to changing social geography, prepared the way for new environmental attitudes in late nineteenth century Pittsburgh. In particular, middle-class women’s activism initially equated health protection with general cleanliness, in the city as in the home.13 Extensions of the public valorization of domestic life and the reinterpretation of domestic amenities as human necessities are evident in the urban social survey movement, of which the landmark Pittsburgh Survey is a paradigmatic expression.14

As Pittsburgh culture lost its provincialism, Pittsburghers began to feel as though they had been duped into accepting pollution that would not have been tolerated in other cities. They complained about the domination of the local economy by heavy industry,
in which Pittsburghers had previously taken such pride. Rather than representing virtuous industry and frugality, Pittsburgh smoke, by the end of the nineteenth century, was a threat to domestic comfort, luxury goods and real estate interests, now seen as legitimate economic concerns.

Reacting to the indictments of the Pittsburgh Survey local elites inaugurated multiple counter-surveys, which sought to diagnose Pittsburgh’s failings according to their own standards. In 1911 the Mellon family, bankers already invested in oil and aluminum, rather than iron and steel, founded an institute of industrial research at the University of Pittsburgh. With it they funded a reform-directed yet putatively scientific survey of smoke: the Mellon Institute Smoke Investigation (MISI). The investigation published ten bulletins between 1911 and 1922 covering a wide variety of smoke-related concerns: a survey of the sources of smoke, and of combustion and abatement equipment, as well as bulletins covering the effects of smoke on architecture, weather, vegetation, human health, psychology and the economic life of the city. Yet, many of MISI’s studies yielded ambiguous results, especially with respect to measurement of progress in smoke abatement and the relationship of smoke to human health.

Chapter Four places the Mellon Institute Smoke Investigation into the context set by the cultural changes that accompanied the rise and fall of natural gas — and, more particularly, into the context set by the Pittsburgh Survey. Central to the Mellon investigation, and the aspect in which it had the greatest connection to Pittsburgh’s changing civic consciousness, were its economic studies. These studies attempted to calculate the cost of smoke to the city by surveying merchants and housewives about lost merchandise and excess work caused by Pittsburgh’s soot burden. They emphasized both
domestic comfort and consumption as goods to be preserved rather than as vices or expressions of frivolity. In this way MISI’s outlook accorded well with the cultural changes the city had undergone in the preceding forty years.

Historians who have examined Pittsburgh’s smoke abatement movement have concentrated on the period, covered in this chapter, between 1890 and World War I. Dale Grinder’s 1973 dissertation and related articles recount how “insurgent” women activists of the 1890s, who sought to punish rather than educate polluters, were superseded by efficiency-minded engineers who stressed education and technological solutions in the second decade of the twentieth century. David Stradling, in his comprehensive 1999 book on smoke abatement in the United States, concurs with Grinder’s view of the centrality of engineers and efficiency concerns to the nationwide anti-smoke movement in the teens. For Stradling aesthetic and health concerns were superceded by economic ones, which he identifies primarily with fuel cost savings. Writing against Hays, Stradling laments the passing of a truly “environmentalist” rationale for smoke abatement. Stradling, like Grinder, links the decline of women’s activism with the decline of non-economic values as motivations for smoke abatement. I argue, instead, that changing attitudes toward smoke in Pittsburgh between the 1860s and the 1910s represent a thoroughgoing redefinition of the category of the economic and its relation to environmental goods. This reorientation reflected a basic realignment of the categories of luxury and necessity and new understandings, both local and national, of the human good.

Building on such views of what was objectionable about smoke, MISI workers, throughout the teens, carried on a campaign of public education and support of the efforts
of the office of smoke inspector. In these years Pittsburgh newspapers, and, on at least one occasion, even the New York Times, declared that Pittsburgh was no longer America’s smokiest city. Such claims were based in part on the ambiguous results produced by MISI investigations and in part on technological and geographical changes affecting Pittsburgh’s industries, which were largely independent of any desire for smoke abatement.\textsuperscript{17}

Chapter Five examines the period leading up to Pittsburgh’s widely celebrated civic “Renaissance” in the 1940s and 1950s, to which a new and, by most accounts, successful smoke control effort was central. The period prior to this, roughly 1918-1941, has been characterized in hindsight as a smoky Dark Age. Yet this period was far from static. It was a time of transformation – change accomplished, change expected and change endured. Smoke and coal were central to the changes claimed, hoped for and feared. In the 1920s Pittsburgers and national writers gloried in the city’s new civic and artistic accomplishments – new achievements that could finally bring the city up to universal standards of urban civilization. Similarly, Pittsburgh newspapers boasted of, and national observers praised, the city’s progress in smoke control. At the same time ambiguous results of scientific work on smoke at the Mellon Institute made clear that such progress was difficult to measure. They promoted a new focus on air pollution, of all types and from all sources, thus minimizing the importance of Pittsburgh’s emblematic, local, bituminous coal smoke problem. Despite these pressures toward seeing Pittsburgh as connected with a universal civilization through art and science, national and local writers and artists celebrated Pittsburgh’s special relationship to local nature through technology and work.\textsuperscript{18} This theme became particularly prominent as a
means to predict Pittsburgh’s ability to withstand threats to its industrial survival raised by declining bituminous coal production and the movement of new investment in the steel industry to the South and West.

Pittsburgh fit pivotally into several important national narratives of the 1930s. Pittsburgh was taken as a harbinger of the nation’s future industrial decline – further advanced, along a dangerous trajectory of “industrial maturity,” than the nation as a whole. Mellon investments, scientific research into the future of bituminous coal and the design of the new Mellon Institute building (dedicated in 1937) set Pittsburgh into a narrative of civilizational change from paleotechnic to neotechnic (as characterized by Patrick Geddes and Lewis Mumford.) Pittsburgh’s new Democratic politics and CIO unionization fit the city into New Deal narratives of rising industrial democracy. All three themes were drawn together in a happy coincidence in the Universal Studios production “Pittsburgh” (1942), starring John Wayne and Marlene Dietrich.

The new Mellon-backed smoke control movement of the Renaissance attempted to create such a happy coincidence in real life. The Pittsburgh Renaissance would focus centrally on remaking the relationship of the city to bituminous coal. The science of smoke abatement at Mellon Institute concentrated ever more on phenomena not unique to Pittsburgh or restricted to bituminous coal. Concomitantly, it was more and more strongly shaped by industrial interests, and provided a less strong basis for pollution regulation in Pittsburgh. The new smoke ordinance would discard much of the earlier Mellon Institute research program. Plans for coal gasification, low temperature coking, gasoline production from coal and processed fuel for smoke abatement were to create jobs for miners and bring Pittsburgh into the neotechnic realm which already absorbed
many Mellon investments. Pursuit of neotechnics, in Mellon hands, was to transform rather than destroy Pittsburgh’s special relationship to local nature and local labor.

Control of visible smoke for the Central Business District largely succeeded, but both the processed coal industry and a general air pollution control program based on human health and extending to the mill towns failed. Similarly, no new industry rose to ensure steady employment for coal miners. Smoke abatement came to pass as coal was replaced in homes by “laborless” natural gas piped from the southwest. Pittsburgh’s relationship to local nature and local labor mattered less and less, as is evident in the final decline of Pittsburgh steel in the 1970s and 1980s. Nonetheless Pittsburgh smoke control, limited and ambiguous success though it was, was a powerful symbol of dramatic, if unsustainable, post-war urban rebirth.21

What follows is a chronicle of the long history of smoke in Pittsburgh. It is intended as a cultural history of one city and one pollution phenomenon that will help us to understand broader relationships between work, technology and nature, as well as between local communities and larger cultural trends.

Notes


17. Tarr, “Searching for a Sink.” Joel Tarr has chronicled the shift from beehive to by-product coking during this period. This change improved air quality but significantly damaged water quality by shifting emissions from one sink to the other.

18. This celebration of industry in Pittsburgh in the national press intensified in the Depression years. Beleaguered Pittsburgh was continually portrayed as mighty and of great endurance. This phenomenon is analogous to the celebration men’s strenuous work in New Deal public art. At just the time when men in particular were unemployed or underemployed, they were show strong, able and eager to work. Barbara Melosh, *Engendering Culture: Manhood and Womanhood in New Deal Public Art and Theater* (Washington: Smithsonian Institution Press, 1991.)


20. *Pittsburgh* (Universal Pictures Co.: 1942) written by Kenneth Gamet and Tom Reed, based on an original story by George Owen and Tom Reed.

CHAPTER 1

SMOKE ON THE URBAN FRONTIER

When you enter Pittsburgh via highways 79 and 279 from the south, you pass through the Fort Pitt Tunnel that bores through Mount Washington, now home to elegant restaurants and scenic overlooks. On the south side of Mount Washington, to all appearances, you are in the country – the density of suburban settlement hidden by the hills and trees. When you emerge from the mountain, you suddenly face a striking city – corporate skyscrapers gleaming, in the wake of the steel industry’s decline – a city surrounded by green hills and framed by wide rivers.

Near the time of Pittsburgh’s founding as a European settlement, from the 1760s on, Mount Washington, then Coal Hill, was on fire. Mount Washington was in those days, before its evisceration through mining, virtually made of coal. The fire, begun by 1763, burned for decades. In summer 1766 Reverend Charles Beatty, charged by his Synod to evaluate religious needs on the frontier, preached in Pittsburgh. He described the underground fire, using images with which he was, no doubt, professionally quite familiar.

A fire being made [on the hill] by the workmen not far from the place where they dug the coal, and left burning when they went away, by the small dust communicated itself to the body of the coals and set it on fire, and has now been burning almost a twelve month entirely under ground, for the space of twenty
yards or more along the face of the hill or rock, the way the vein of coal extends, the smoke ascending up through the chinks of the rocks, The earth in some places is so warm, that we could hardly bear to stand upon it; as one place where the smoke came up we opened a hole in the earth till it was so hot as to burn paper thrown into it; the steam that came out was so strong of sulphur that we could scarce bare it. We found pieces of matter there, some of which appeared to be sulphur, others nitre, and some a mixture of both...²

Neville Craig and subsequent Pittsburgh historians were skeptical about the fire’s extent and duration,³ but the Pittsburgh City Directory for 1826 claimed that the fire still burned then:

In that part of the hill above the Pittsburgh Glass-works...there has been fire burning for many years, and the smoke may be seen daily curling from out the fissures of the rocks. The fire is in the midst of the great strata of coal that here stretches along the hill.... Frequent attempts have been made to suppress the burning, by stopping up the mouth of the mine and neighboring crevices...but in vain it still rages, and is daily extending, and may some day produce serious consequences.⁴

Coal was burned in the English fort constructed at the Forks of the Ohio in the 1750s⁵ and vapors from the Coal Hill fire hung over the garrison town. European settlement at Pittsburgh was joined, from the very beginning, with the smoke of bituminous coal.

Pittsburgh and its smoke were born together. Unlike London, Pittsburgh was not a Great City that environmental pollution later sullied. The building of the city and the shaping of environmental practices and attitudes in it were intertwined. How was Pittsburgh established as the Iron City, the Smoky City in the midst of the trans-Appalachian wilderness? What kind of a place was Pittsburgh built as? Most importantly, Pittsburgh was new, a place whose existence had to be argued for. Arguments supporting settlement pointed to its linked strategic and geographical “advantages.”

In this chapter I will describe the geographic and political conditions surrounding Pittsburgh’s founding. I will examine the role of smoke and coal in the justification of
Pittsburgh’s existence as a frontier city and in predictions for its exceptional future industrial development.

1.1 Advantages

Pittsburgh’s original identity depended on strategic advantages, on its relation to political geography. It began as a fort served by a village, on the border of two empires, capital of a region of conflict between the empires and between the British Americans and the Indians. What made Pittsburgh suitable as a human settlement was the confluence of two large rivers to form a third – notable to Europeans for the military advantage a fort at such a confluence would confer. Although people of the six nation Iroquois Confederacy lived throughout Western Pennsylvania and Ohio – a number of groups coming to the region after having been pushed out of eastern Pennsylvania by white settlement – the Forks of the Ohio did not mark a settlement of particular importance for Native Americans. The land was low, swampy, heavily forested and prone to flooding. The attraction of the “command of the two rivers,” to be noted by George Washington, was a military one, valuable chiefly in light of long-range artillery technology. In the eighteenth century the confluence of the Allegheny and Monongehela sat at the boundary between English and French possessions in the New World, at the westernmost point of English settlement, and at the edge of the fur-trade region of the continent. Pittsburgh owed its beginnings to its strategic location on the frontier.

In 1748 a group of Virginians interested in increasing Virginia’s share of the fur trade, and calling themselves the Ohio Land Company, received a grant of 500,000 acres of land west of the Allegheny Mountains, between the Monongahela and Kanawha
rivers. The next year French military captain Celeron de Bienville came down the Allegheny from the St. Lawrence to bury lead plates and put up tin plaques to re-claim the Ohio Valley for France. The English soon mobilized to protect their interests in the region. During the 1750s French and British battled over the Forks of the Ohio – a location key to the military and economic aims of each. The young George Washington (also an Ohio Land Company member) described the military advantages of the future site of Pittsburgh in a report to his superiors in 1753. Both the French and the Virginians wanted to build a fort at the forks. Although the English were first to accomplish the task, they were soon overtaken by larger French and Indian forces who built Fort Duquesne on the spot and deforested the flood plain that would become Pittsburgh’s “Golden Triangle.” The French, however, maintained control of the forks for only a few years. In 1758, after recurrent frustration and defeat, the British headed toward Fort Duquesne to attack with a stronger force than ever before. The French set fire to the fort and abandoned it to them. The British built a large and impressive fort at the Point which they named Fort Pitt. Settlement grew with the fort, a trading post and garrison town growing up almost immediately. Fort Pitt and Pittsburgh were nearly synonymous from the beginning. In 1760 the first recorded population of Pittsburgh stood at 464 persons.

The Forks of the Ohio sat at the easternmost boundary of the Mississippi watershed and just West of the Appalachian mountains. In the eighteenth and early nineteenth centuries, when overland transportation was difficult and railroads, canals and turnpikes had yet to be built, water transportation was very important. The settlement’s position at the head of what would become the great water highway to the West and
South gave it a pivotal role, first in the Indian trade and then as a provisioner for troops in Indian wars.

In 1788 Pittsburgh was made the county seat for the new Allegheny County, which until 1800 included all land northwest of the Allegheny River, and in 1794 it was incorporated as a borough, its 1200 residents all living on the flat land between the rivers and bounded by the hills to the east. By the 1790s Pittsburgh was no longer merely a trading post in Indian country. The exposure of young soldiers to the richness of southwestern Pennsylvania when they came to put down the Whiskey Rebellion in 1794, and Mad Anthony Wayne’s defeat of Indian resistance in at the Battle of Fallen Timbers in the same year, stimulated migration to the area and through it into the Ohio and Mississippi valleys. Pittsburgh quickly became a center of trade and travel, a place that many passed through. Its role in the Indian trade was soon eclipsed by its identity as a center of craft production for Western settlers.

Strategic and geographical advantages combined to make a market in the West for goods sold and produced in Pittsburgh. The Ohio River, as conduit for immigrants going West, created a market for goods to be sold, and later made, in Pittsburgh. The Ohio would also facilitate Eastern trade links with the West and South. The mountain barrier made overland trade from the East difficult. The expense of goods carried over the mountains from Baltimore and Philadelphia provided incentive to local manufactures. Heavy iron and fragile glass, items that would figure prominently in Pittsburgh’s early industrial history, were particularly hard to move over the Alleghenies in the years before turnpikes.
The region was celebrated as one of prodigious beauty and abundance. The rhetoric of the prodigiousness of the New World and of the frontier provided the ideological framework for Pittsburgh’s siting and building. The New World, the Pittsburgh region, and the resources contained therein, were seen both as remarkably or impressively great and, judging by Old World standards, as abnormally and unnaturally so. Pittsburgh’s site, isolated from population advance by the Alleghenies and the Blue Ridge, replicated, in miniature, the trans-oceanic isolation of the coast. The trans-Appalachian frontier formed a new New World. The new frontier, like the New World itself, was described as unsullied, undepleted, virginal, beautiful, picturesque, robust, healthy, and bountiful. Early descriptions of the Forks celebrated these qualities as related aspects of the city site’s “advantageous situation.”

Early accounts, French and British, agreed on the striking beauty of the landscape of southwestern Pennsylvania and the Ohio Valley. The French were moved to name the Ohio (including the Allegheny, north of the forks) the “Belle Rivière.” When Virginians made the first English expedition over the Blue Ridge in 1716, they called the forested landscape they saw looking down from the summit “a solemn and sublime temple of nature.” Johann David Schopf, a surgeon to German mercenaries who fought on the English side in the Revolutionary War, and traveled around the new country in 1783 to investigate its natural history, noted the lushness of the vegetation near Pittsburgh: “native plants had a luxuriant, rich look, and grew much stronger and larger than is their habit elsewhere. In a newly planted and unfertilized garden there stood stalks of common sunflowers which measured not less than twenty feet in height and six inches in diameter and were almost like wood.” Remarks on the natural beauty of the site are common. In
1802 François André Michaux, son of a famous French botanist, was sent by the French Minister of the Interior to the United States to study the forests and agriculture of the new country. Michaux traveled through the Allegheny Mountains and down the Ohio and remarked on the view to be had from the hills overlooking Pittsburgh: “From this spot may be enjoyed a most agreeable prospect, produced by the view of these three rivers, the banks of which are embellished with forests...” Thomas Ashe, who traveled the United States in 1806 investigating the western rivers, praised Pittsburgh for its potential commercial advantages as well as for the “charming view” of the rivers and its “peculiarly grand and striking” “natural situation.”

The region was not only beautiful but eminently desirable to Europeans for its furs, timber, and fertile soils as well as for its strategic location. The natural bounty of western Pennsylvania and the Ohio Valley figured prominently in discussions of the advantages of Pittsburgh’s site. But most conspicuous was the abundance of coal. Pittsburgh’s coal is part of the extensive Pittsburgh Seam. This coal underlies much of the Appalachian Plateau of which western Pennsylvania, eastern Ohio and northern West Virginia and Maryland are part. Old World visitors marveled at coal veins so close to the surface and within such easy transportation of population centers. European wonder at the bounty of the New World was conditioned by European scarcities, especially of timber and easily accessible coal. Both factors would shape Pittsburgh’s growth as a center of industry. Yet resource use in the New World was also determined by the interaction of European valuations with more local abundances and scarcities, labor shortages in particular. Abundance of fuel and scarcity of labor made the situation of
Pittsburgh’s coal seem especially prodigious. In 1783, Johann Schopf described the situation in Pittsburgh:

The...coal bed in the heart of the hill is the more remarkable because coal must usually be dug down for....The strange situation of this horizontal layer of coal is most convenient for the inhabitants. The loosened coal is merely thrown into a trench dug in the steep face of the hill, in which it rolls down to the river bank and is caught in the boats waiting there for it.... The coal is the property of the landowner, who for the small price of one penny a bushel, lets every one help himself at his own pleasure. In the future settlement of this region the great coal supply will be of particular advantage in the general development of the country because economy in the use of timber will be less necessary; it will facilitate the use of other minerals here, and even be a considerable article of export.\textsuperscript{24}

The Pittsburgh region would not have to be deforested for fuel as most of Europe and much of coastal America had been, a savings of both labor and timber itself. Timber would remain abundant for building homes and factories, making tools, machine parts and boats and for exporting down-river. Coal was easier to dig in the Pittsburgh area than in any place European and Eastern travelers had previously encountered. British visitor Francis Bailey, writing in 1796, noted the seam’s nearness to the surface: coal “abounds all over the western country, and lies so near the surface of the ground that the waggon (sic) often cut into it on the roads.”\textsuperscript{25} According to French visitor Victor Collot, (1795-6), because the coal was so inexpensive and of such high quality, “although the inhabitants live in the midst of forests they prefer it to their best wood.”\textsuperscript{26} F. A. Michaux echoed other travelers:

...[coal] is so common and so easily procured that several of the inhabitants burn it for cheapness. This does not arise from a deficiency of wood; the whole country is covered with it: but labour is so very dear, that there is not a landholder at Pittsburg who would not sell a cord of wood for half the price which coals would cost, if the purchaser would go a mile to fell the trees, and bring them home.\textsuperscript{27}
Coal was cheap because it was abundant, near the surface, and deposited above the city, so that it could easily be moved from where it was mined to where it would be used. In Europe coal had generally been used only when wood was scarce. Yet, in America, and especially in the West, where labor was scarce and natural resources abundant, the substance of the earth substituted for human labor.

The abundance of the region’s coal supply was not simply an exaggeration of early travelers. The prominent British geologist, Charles Lyell, who visited Pittsburgh in 1842 as part of his American tour, described the region’s navigational, agricultural and geological advantages. He was particularly impressed with the abundance and accessibility of its coal.

I was truly astonished now that I had entered the hydrological basin of the Ohio, at beholding the richness of the seams of coal, which appear every where on the flanks of the hills, and at the bottom of the valleys, and which are accessible in a degree I never witnessed elsewhere. The time has not yet arrived, the soil being still densely covered with the primeval forest, and manufacturing industry in its infancy, when the full value of this inexhaustible supply of cheap fuel can be appreciated; but the resources which it will one day afford to a region capable, by its agricultural produce alone, of supporting a large population are truly magnificent. In order to estimate the natural advantages of such a region, we must reflect how three great navigable rivers, such as the Monongehela, Allegheny and the Ohio intersect it and lay open on their banks the level seams of coal. I found at Brownsville a bed ten feet thick of good bituminous coal, commonly called the Pittsburgh seam breaking out in the river cliffs near the water’s edge....Horizontal galleries may be driven every where at very slight expense and so worked as to drain themselves while the cars laden with coal and attached to each other glide down...on a rail way. So as to deliver their burden into barges moored on the rivers’ bank. The same seam is seen at a distance on the right bank and may be followed the whole way to Pittsburgh fifty miles distant as it is nearly horizontal while the river descends it crops out at a continually increasing but never at an inconvenient height above the Monongahela. ... below which again are other seams... another layer of workable coal ....Almost every proprietor can open a coal pit on his own land and the stratification being very regular they may calculate with precision the depth at which the coal may be won....
The large deposits of coal, close to an important river transportation network spoke of great industrial potential for Pittsburgh even before 1800. Coal was also accounted an important advantage in Pittsburgh because the region contained other mineral resources useful for iron and glass making: sand, limestone and iron ore.

The composition of Pittsburgh coal, not just its plenitude, accessibility and cheapness, increased the likelihood of smoky combustion. Coal is made up of fixed carbon, ash, moisture and volatile matter, in varying proportions. Carbon and volatile matter combine with oxygen when coal burns. Carbon is relatively easy to burn completely, but volatile matter is not, unless high temperature and good draft are carefully maintained. The more volatile matter contained in a type of coal, the more difficult its complete combustion will be to secure. Pittsburgh coal is smoky because it has a high percentage of volatile matter, varying from 41.4% to 80.9%.²⁹

Pittsburgh’s geography and its easy access to huge deposits of high volatile bituminous coal would combine with particular historical circumstances to make Pittsburgh a great producer of both manufactured goods and smoke. By 1792 the town employed “36 mechanics” including 5 blacksmiths, and several manufacturers had already begun coal-based operations. Pittsburgh was a center of glass production from the 1790s due both to the difficulties of transporting glass from the East over the Appalachians and the local accessibility of coal for fuel. Its first glass factory, established in 1797,³⁰ was the first glass works in the United States to burn coal. By 1806 Pittsburgh was a manufacturing town and the same Thomas Ashe who was impressed with its natural beauty described it as such. The town at the beautiful forks “abound[ed] with
mechanics, who cultivate most of the different manufactures” including glass, nails, hats and tobacco, as well as ship-building.  

Nearly all writers from this point on spoke both of natural beauty and of commercial and industrial importance. Christian Schultz writing in 1807 said, “Pittsburgh is most charmingly situated.... the natural advantages which this place possesses are so great, that it may justly be considered as the metropolis of the western country.” Fortesque Cuming’s 1807 Western tourbook, published by Pittsburgh gazetteer and migrant guide Zadok Cramer praised Pittsburgh’s geographic “situation” as “unrivaled with respect to water communication.” Pittsburgh was not only a manufacturing town by this time, but a manufacturing town for the West.

Increased manufacturing for the West magnified the importance of Pittsburgh’s coal and intensified the smokiness of its air. Increased immigration brought more and more visitors from wood-burning regions to the headwaters of the Ohio who observed and commented on Pittsburgh and its smoke– both domestic and industrial. The city’s environment was sharply different from the rest of the United States where wood consumption would exceed coal consumption into the 1890s. By contrast, coal served as Pittsburgh’s primary fuel from the very beginning. Smoke was evidence of Pittsburgh’s industry. Both the level of development and the industriousness of the population were read from the smokiness of the air and taken to predict Pittsburgh’s future development. Smoke was also evidence, however, of the prodigiousness of the new country both in mineral abundance and in the strange environment created by it. Smoke transformed the picturesque in Pittsburgh from wonder at the virginal lushness of the Belle Rivière to awestruck admiration for spectacles of industry. Travelers searched for the picturesque in
the West and they found it in Pittsburgh, either by focusing on the spectacular natural setting and ignoring industry (in the manner of the Hudson River painters for the industrializing Hudson Valley) or by celebrating the industrial sublime.

Early observations of smoke were often embedded in typical New World rhetoric about the beauty and bounty of the landscape. In 1786, H. H. Brackenridge, a Pittsburgh lawyer, newspaper columnist and nationally known novelist, described Pittsburgh’s location as “delightfully romantic,” characterized by “lofty hills and endless woods.”

He suggested the Forks as a suitable setting for the frolic of Greek river gods, nymphs and satyrs, but also celebrated its abundant coal. Four years earlier, John Bernard had described Pittsburgh as follows: “On approaching Pittsburgh we were struck with a peculiarity nowhere else to be observed in the States: a cloud of smoke hung over it in an exceedingly clear sky, recalling to me many choking recollections of London.”

In 1807 the same Christian Schultz who had extolled the city’s “natural advantages” said: “The first entry into Pittsburgh is not equally agreeable to every person, as the sulphurous vapour arising from the burning of coal is immediately perceptible; a few days residence will, however, in a great measure accustom you to this inconvenience.”

Writing more the thirty years later, Lyell took Pittsburgh’s smoke as a commonplace:

It is a most flourishing town and we counted twenty-two large Steam Boats anchored off the wharfs. From the summit of the hill four hundred and sixty feet high on the left bank of the Monongahela we had a fine view of Pittsburgh partially concealed by the smoke of its numerous factories.

Pittsburgh publisher Zadok Cramer produced a guide for immigrants called The Navigator, first printed in 1801. Cramer died in 1813, but his guidebook continued to be printed posthumously. The Navigator brings together the perspectives of resident and
traveler on Pittsburgh and describes the city in the context of the development of the Ohio Valley. Cramer, highlights several themes in early discussion of the city: natural beauty, resource abundance, a virtuous and sober population and ubiquitous smoke. The guidebook advertised itself as “containing directions for navigating the Ohio and Mississippi Rivers with an ample account of these much admired waters from the head of the former to the mouth of the latter and a concise description of their towns, villages, harbors, settlements &c....” Directions for navigating the Ohio River begin at its source. Cramer described Pittsburgh as:

a place of note and celebrity not only in America, but even in Europe. The traveler, however, on entering it for the first time, meets with some disappointment. The town enveloped in thick clouds of smoke, which even affect respiration; the appearance of the houses is dark and gloomy, from the general use of coal, particularly in the numerous manufactories, which send into the air immense columns of smoke, There are few elegant buildings compared to other towns of the same size, and the streets are narrow and unpleasant....But the topography makes amends for all these disadvantages. All concur in the beauty of its position....

He speaks of the “romantic hills” which confine the plain on which the city is built and says that the “hills to the east of the town gradually attain an amphitheatrical elevation....affording many pleasant positions for country seats.” He describes the “high and beautiful plain” over the Allegheny and the view from Coal Hill.

The prospect from the top of the Coal hill is extremely beautiful and romantic. The distant view presents forest-clad hills, sloping into narrow vales; the beautiful Allegheny with its clear and limpid waters, bright and shining, and holding a rapid course compared with that of the Monongahela which, the contrary, seems with its turbid waters to advance lazy and slow, as if to yield involuntary submission.....Just above this place the river on the Pittsburgh side washes a steep hill, studded with romantic rocks and leaves on the other a handsome plain, where a town named Birmingham has been laid out.....In looking down from Coal hill into Pittsburgh, one is reminded of Shakespear’s description of the view from Dover cliff; and seems a giant compared to the busy Lilliputians below...
Cramer claimed that Pittsburgh, since the defeat of local Indians in 1794, “...has increased with greater rapidity, not even excepting Lexington and Cincinnati, than any inland town in America.” He goes on to give enumerations of manufactures and of the trade of the city, as well as the ethnic heterogeneity and the cultural attractions. He characterized it as a place where “luxury, pomp and parade are scarcely seen, noting that “there are perhaps not more than one or two carriages in the place.”

Cramer, like other writers, discussed Pittsburgh’s plentiful coal as a natural wonder: “This place has long been celebrated for its coal banks: and both as to quantity and quality, it is not exceeded by any part of America, or perhaps the world.” Cramer’s description of bountiful outcroppings overlaying a similarly abundant substratum, such as would have ordinarily been mined in Europe, makes clear the prodigious nature of this New World abundance: “It is supposed, and perhaps with good reason, that the main or principal stratum lies considerably deeper, as in the English collieries; but the quantity so near the surface of the earth will, for a long period of time, render it unnecessary to look for it at a greater depth.”

For Cramer, coal was an antidote to poverty:

Fuel, that indispensable necessary of life, is so cheap here the poorest rarely suffer from the want of it. We do not witness near Pittsburgh that pitiable spectacle, the feeble infancy and decrepit age of the unfortunate poor, suffering in a cold winter day for a little fire to warm their meagre and chilly blood; we do not see them shivering over a few lighted splinters or pieces of bark gleaned from the highways, or torn form the fences in the skirts of the town.

Like Cramer, travel writer Fortesque Cuming took smoke as evidence of natural bounty, industrial promise and a kind of economic democracy:
Another cause of the unprepossessing appearance of Pittsburgh, proceeds from the effect of one of the most useful conveniences and necessaries of life, which it enjoys in a pre-eminent degree; namely, fuel, consisting of as fine coal as any in the world, in such plenty, so easily wrought, and so near the town, that it is delivered in wagons drawn by four houses at the doors of the inhabitants, at the rate of five cents per bushel.

A load of forty bushels which costs only two dollars, will keep two fires in a house a month, and in consequence, there are few houses, even amongst the poorest inhabitants, where at least two fires are not used – one for cooking, and another for the family to sit at. This great consumption of a coal abounding in sulphur, and its smoke condensing into a vast quantity of lampblack, gives the outside of the houses a dirty and disagreeable appearance -- even more so than in the most populous towns of Great Britain, where a proportionably great quantity of coal is used; which must be caused, by a difference of quality, which appears in the grate to be in favour of the coal of this country.42

Cuming passed seamlessly from coal’s economic beneficence to its environmental malevolence, evident from its high sulphur content. In this he continued the practice of observers who integrated discussion of Pittsburgh’s natural beauty with description both of its abundant coal and of its copious smoke.

1.2 Smoke and Health on the Frontier

Abundant cheap coal enhanced the well-being of Pittsburgh’s population. Not only was smoke evidence of this abundance, it, in itself, contributed to Pittsburgh’s exceptional healthfulness. Pittsburgh was advertised in the late eighteenth and early to mid nineteenth centuries as a particularly healthy place by prominent inhabitants and observers.

Although American birthrates climbed and deathrates fell during the eighteenth century, by the early nineteenth century, health in American cities had begun to deteriorate. This was due largely to infectious diseases attributed to the living conditions and habits of the urban poor and to the unhealthfulness of particular urban environments, such as New Orleans and the cities of the Eastern seaboard. Environmental conditions were believed
to strongly influence, if not determine, illnesses. Health, disease and medicine were all specific to place, hence it was places, more than anything else, that determined the health of populations. Places themselves were regarded as healthy or unhealthy largely on the basis of the quality of their air. Air quality, in turn, was determined primarily by the degree to which the air was taken to be impregnated with certain organic materials: chemicals and particles, the exhalations of land, water and living beings. Swamps were regarded as particularly dangerous and were ubiquitous in cities near coasts and rivers, especially Southern rivers. Well-drained land made healthy air.43

Pittsburgh, in a mountainous region, far from the sickening established cities of the coast and also from the swamps of the lower Ohio and Mississippi valleys, was regarded as a healthy place. The mountains leading to the rivers made for good drainage. Pittsburgh publisher Zadok Cramer’s guidebook for Ohio and Mississippi River migrants, The Navigator, extolled Pittsburgh’s healthfulness in a section entitled “Latitude & c”:

Our climate, though irregular, and subject to many changes in the different seasons is healthy; any thing like epidemical diseases, fevers &c. being unknown among us, except those that rage without bounds, such as the influenza in the summer and fall of 1807, whose contagion, though but in few instances mortal, flew to all parts of the United States.44

Even those travelers, like American physician, nature writer and canal engineer, David Thomas, who complained about Pittsburgh’s smoke acknowledged the “salubrity of situation” of the city.45 Similarly, English traveler Henry Bradshaw Fearon remarked:

...I remained at this place for several days, during which time the rain never ceased. The smoke is also extreme, giving to the town and its inhabitants a very sombre aspect; but an English medical gentleman who has resided here some years informs me that there is not a more healthy place in the United States.46
Zadok Cramer, however, differed with such observers by taking smoke as a disadvantage of abundant coal: “every blessing has its attendant evil.” For Cramer smoke compromised cleanliness “and even health.”

Pittsburgh physician William Denny and Glasgow physician L. Callaghan, who had taken up residence in the city, both wrote articles in the late 1820s surveying Pittsburgh’s geographical situation and its relation to the health of its population. Both began their articles by pointing out that Pittsburgh, although set in a valley, was considerably higher in elevation than the nearest other bodies of water – the Atlantic Ocean, Lake Erie, the Chesapeake and the Hudson River at Albany. Denny took Pittsburgh’s location to be especially healthy, saying, “From.... these sources of malaria, it is divided also by mountain ridges or plateaus of great elevation” and described the city as “open to free ventilation by the north-east and north-west winds.” According to Denny: “Of all the great western towns, Pittsburgh is the farthest removed from the baneful exhalations of swampy borders of the Mississippi, and accordingly enjoys a greater exemption from those diseases, which during the summer and autumn prevail even as high up as Cincinnati.” Pittsburgh gained competitive advantage in claiming to be healthier than its chief urban rivals down the Ohio. According to Denny the complaints most common in Pittsburgh were “those which characterize (sic) the healthiest situations of the same latitude, elsewhere in America; in winter pneumonia and sore throat and in summer bilious afflictions.” He found in Pittsburgh, in addition to less pulmonary tuberculosis than in eastern cities, less scrofula, skin disease, yellow fever, bilious fever, ague, cholera infantum and malignant cholera than in western cities.
According to Denny, Pittsburgh was “the intermediate link of disease, as well as of commerce; we have less hepatic disease than the west, less pulmonic disease than the east.”\textsuperscript{49} Like Denny, Callaghan claimed “we are happily free from marsh miasmata” and are “strangers to those forms of intermittents which are endemical east, west, north and south of us.” Diseases resulting from debility, such as “the low forms of typhus” were apparently rare.

Callaghan, though he noted the abundance of “a rich bituminous coal,” he did not mention cheap coal as a factor in keeping Pittsburghers warm and possibly protecting them from debility. Neither did he mention coal smoke as anti-miasmatic.\textsuperscript{50} For Denny, on the other hand, both these sequelae of abundant coal contributed to the health of Pittsburghers. Of coal smoke’s contribution he says:

That exemption [from fevers] is supposed to be aided by an artificial cause. The combustion annually of ten millions of bushels of bituminous coal fills the atmosphere with carbureted hydrogen, sulphurous gas, and the all-pervading impalpable dust of carbon...It [smoke] is anti-miasmatic and hence it is, that formerly the natural ponds, and latterly the foul and stagnant artificial basins, have never generated remittent or intermittent fever.\textsuperscript{51}

Protection from malaria had wide-ranging consequences: “Dropsies, dysenteries, diarrheas and cholera, diseases which are influenced by causes of a malarious origin, have never prevailed to any extent.” Denny also took Pittsburgh’s rising smoke levels as a possible cure for the cases of goiter which had once been prominent there: “It is not improbable that the presence of iodine in our peculiar atmosphere, so charged with particles of soot, or some other unknown element in our smoke, has had a salutary effect...” Denny also claimed that coal smoke had the effect of “arresting the tendency to
the formation of tubercles in the lungs” thus contributing to the rarity in Pittsburgh of pulmonary tuberculosis.

Denny admitted that “[s]trangers with weak lungs, for a while, find their coughs aggravated by the smoke, but nevertheless asthmatic patients have found relief in breathing it.” Denny, amplifying the claims of Cramer and Cuming, proclaimed coal’s contribution to the health of the poor:

...coal is our creditor in another way: its abundance, cheapness and consequent general and profuse use by the poorest inhabitants, is undoubtedly a great cause of our superior healthfulness....The low fevers, so prevalent (sic) in the large cities among the poor, during a hard winter; and the ague and fever, so common in the eastern counties where wood is scarce are here in a measure prevented by the universal practice of keeping good coal fires, late in spring, and early in the autumn and indeed at all seasons when the weather is damp and inclement.52

Denny’s claims for the health consequences of abundant coal went beyond Cramer’s and Cummings’, however. For Denny, Pittsburgh’s coal provided not only affordable heat but its coal-based industry offered a greater degree of economic stability to Pittsburgh’s poor, and this economic stability was, in turn, a chief determinant of health. Denny examined the expected effects of the growth of Pittsburgh’s industry on mortality rates. While he took it as given that greater manufacturing employment would increase deathrates, he argued that factors peculiar to Pittsburgh would save the city’s population from the degree of health deterioration seen in European factory districts. Denny pointed to Pittsburgh’s lesser and later employment of child labor, its better food, lack of residential crowding and, most of all, the fact that “none [of its workers] labor[ed] under the continual apprehension of being, by the fluctuations of trade, thrown out of employment and wanting bread.”
Denny concluded his article with promotional rhetoric that captures the purpose of his entire survey of Pittsburgh’s health:

On the whole with regard to the health of Pittsburgh, it may be said that no city in the union is more healthy, and that none resists better the malarious diseases, to which, during the autumn, the whole great valley is more or less subject. Indeed of the adjacent country, including nearly all of Western Pennsylvania, it may be said, that no part of the United States, is better suited to a European constitution, and that the greater part will bear no comparison with it in point of salubrity.53

It is important to note that Denny was member of a prominent Pittsburgh family, who went on to become an official in Pittsburgh’s Merchant’s and Manufacturer’s National Bank. He had a significant stake in promoting the city’s financial well-being.54 His discussion of coal smoke’s contribution to health was quoted, as late as 1889, alongside claims about the city’s low death rate, in documents advertising Pittsburgh’s industrial development and potential.55

Pittsburgh’s location was strategic for interdependent military and commercial reasons. Many of the “advantages” cited in arguments for Pittsburgh’s existence and development were extrinsically defined, and temporary, based on shifting imperial fortunes. These accidents of strategic location were supported by less ephemeral geological advantages. Yet, even the value of natural resources depended not on qualities of the city itself but on its relation to other areas. As such relations changed, so did the city’s prospects. Resource richness proximate to the shifting frontier would provide an unstable base for civic identity.
1.3 Instability and Industrial Growth

While its many geographic and strategic advantages may seem to make Pittsburgh’s existence and siting inevitable, geographic advantages can be pointed to for many locations at which cities both did and did not arise. In addition, strategic advantages, sensitively dependent on changing political situations, shifted during Pittsburgh’s early history and during the period of city-building. Yet, the notion that natural features of the city’s location, valued for their usefulness in frontier days, conferred a providential destiny would shape Pittsburgh’s civic self-conception for years to come.

Pittsburgh was the West in the eyes of the English and early Americans. It stood in the midst of empty wild land – beautiful, frightening and pregnant with possibilities. Both abundance of raw materials and frontier location would place the emphasis in city-building on the site rather than on civic culture.

Zadok Cramer promoted Pittsburgh even as he served as a guide for immigrants. His promotional rhetoric explicitly raised the issue of the economic insecurity of new cities, by arguing against reliance on the established cities of the East to provision the West. He claimed that Pittsburgh was “in fact less liable to changes, and to sudden relapse, than almost any situation in America.” But in making this point, he highlighted the importance of the fear of such reversals in Western towns. Cramer relied on the sense of Pittsburgh’s special destiny prescribed by Nature: “The cheapness of fuel and of all the necessaries of life, the favourourable position for distributing its manufactures over an extensive country, will probably make it at some period or other the first inland town in America.” Nonetheless, his discussion of Pittsburgh in his guidebook is an exercise in justifying the city’s right to exist.
Cramer argued that Pittsburgh was uniquely resilient because of its natural advantages, but exploitation of all of these depended on the questionable navigability of its rivers. Cramer wrote in *The Navigator*:

> On shoving off from Pittsburgh, if the water should be high, your boat will require but little attention....But in low water, for which these directions are intended, it requires more circumspection...57

Travelers repeatedly remarked on the difficulties of being detained in Pittsburgh by low water. Thomas, writing in 1816, was eager to leave the city.

> Having been detained, day after day, longer than we expected, this morning about sunrise, we left Pittsburgh with all the joy of a bird which escapes from its cage ‘From the tumult, and smoke of the city set free’...58

The unpredictable navigability of the rivers near Pittsburgh made its shipping-dependent commercial success tenuous. Pittsburgh’s early commercial success was based largely on its status as a “freshwater seaport” carrying goods downriver to New Orleans.59 In 1792 the city began to participate in trans-oceanic trade and after 1800 the city’s shipbuilding industry grew impressively. River levels fluctuated constraining both shipping and the ship-building industry: ships could only go downriver at high water.60 Pittsburgh shipping interests rebounded by introducing flatboats, which required very little depth, for down river transportation and long, narrow keelboats for the return journey. Over the long term, however, the advantage of river location combined with questionable navigability of the rivers and competition with other river towns lent an air of precariousness to river-trade success in early Pittsburgh that would leave a deep imprint on the character of the city.

Pittsburgh grew into its urban identity not as a “city on a hill” but as metropolis for and gateway to the new West. As such, its civic life was shaped by elements of frontier ideology. It was extrinsically and instrumentally valued, potentially disposable
and temporary, a place on the boundary, where old rules did not apply. It was well-suited to be used and valued not for itself but for what it made, whatever the cost to the place itself. Early on, what Pittsburgh made, in addition to coal-heated glass, was iron. By 1810 Pittsburgh was already known as the “Iron City.” When Pittsburgh was chartered as a city in 1816, iron was already the biggest, though by no means the only, major industry in Pittsburgh. Pittsburgh’s most important products were provisions both for western immigrants and western armies, ironwork and cannonballs chief among them. The War of 1812 brought booming business to Pittsburgh since the Ohio and the Mississippi provided the main water route north and south after the coastal sea route south was cut off. More North-South commerce went through Pittsburgh during the war than ever before. Pittsburgh’s commercial life had war as its foundation – as a garrison town trading post, an army provisioner and as an alternative seaport to those whose business was blocked by war. The Pittsburgh Directory for 1815 attributed Pittsburgh’s recent growth from a population of 2,400 in 1800 to (an estimated) 9,000 in 1815 to the War of 1812:

This great increase in population is to be attributed to the late war with Great Britain, which converted a great portion of the capital of the seaboard into manufactures, much of which was concentrated in this place. The transportation of southern produce during the war, through Pittsburgh across the mountains, also contributed greatly to the increase of the population here.

Yet, as is suggested by Cramer’s need to make confident assertions to the contrary, temporary military production was yet another unstable base on which the city’s economy rested.

By 1814, with a population of six to eight thousand and 130 manufacturers of varying sizes, Pittsburgh was very different from the village of 1792 with its 16
industries and 36 mechanics. But it was a city built on the precarious bases of temporary military production and strategic commercial location in relation to particularly volatile markets. The effects of the shift from keelboats and flatboats to steam provide another example of the precariousness of the city’s economic base. After the first test of steamboats on western waters in 1811, Pittsburgh became an important center for steamboat river travel. In the steamboat Pittsburgh coal had found yet another use, one that combined the city’s defining advantages of access to the three rivers and abundant coal. Steamboat building became an important industry in the city with one half of all western boats built in Pittsburgh in the early nineteenth century. Steamboat traffic would add to Pittsburgh’s smokiness by the 1820s and would carry smoke down river. Yet it would also contribute to worries about the city’s decline by improving the commercial fortunes of rival cities down the Ohio.

Although the War of 1812 had provided a stimulus to manufacturing, its end brought commercial decline to the city. When the war ended, Pittsburgh was left to struggle with the difficulties of its extrinsically defined identity. The war was followed by a temporary slump caused by British dumping of goods which “very nearly proved the ruin of Pittsburgh industry.” In 1815, the city employed 1,960 workers but in 1819 it employed only 672. Estwick Evans, writing in 1818, remarked that: “The business of Pittsburgh is great: but is generally believed to be declining.” Fearon, in contrast to Evans, was optimistic about Pittsburgh’s prospects in spite of its current difficulties:

Upon the whole, I consider Pittsburgh, in every point of view, to be a very important town; and have no doubt, although its prosperity is now at a stand, and property if not declining is not increasing in value, that it will gradually advance; and that the time must come when it will be an extensive and very populous city.
Pittsburgh’s economic success was far from predetermined. It was the city’s justification for existence, and as such was built laboriously and guarded jealously. Throughout its history, Pittsburgh would play one set of economic advantages off against the other. When its primacy as Western entrepot was first threatened after the War of 1812 the city attempted to make up in manufacturing what it lacked in trade. The city’s other geographic advantages – geological rather than hydrological – made this alternative civic identity possible.

Many travelers wrote of Pittsburgh in the teens – speculating on its future based in “advantages” and celebrating the extensiveness of its manufacturing enterprise while making fun of over-blown descriptions of the same. In 1818 Estwick Evans predicted that Pittsburgh would become the “Birmingham of America” – a title he attributed to the Niles Register in 1814. Using the same allusion, the English Quaker farmer Morris Birkbeck, writing in 1817, believed that reports of both Pittsburgh’s smokiness and its industry had been greatly exaggerated. Such exaggeration expressed belief in the prodigious character of the West and showed smoke’s role in the promotion of the city and in arguments for its existence and worthiness.

Surrounded by all that is delightful, in the combination of the hilly woodlands and river scenery, at the junction of the Allegheny and Monongehela, forming by their union the Ohio, stands the “city of Pittsburg, the Birmingham of America.” Here I expected to have been enveloped in clouds of smoke, issuing from a thousand furnaces, and stunned with the din of ten thousand hammers.

There is a figure of rhetoric adopted by the Americans, and much used in description; it simply consists in the use of the present indicative, instead of the future subjunctive; it is called anticipation. By its aid, what may be is contemplated as though it were in actual existence. For want of being acquainted with the power and application of this figure, I confess I was much disappointed by Pittsburg. A century and a half ago, possibly; the state of Birmingham might have admitted a comparison with Pittsburg. I conceive there are many, very many, single manufacturing establishments in Great Britain, of more present importance
than the aggregate of those in this town: yet taken as it is, without rhetorical description, it is truly a very interesting and important place. Steam engines of great efficiency are made here and applied to various purposes, and it contains sundry works: – iron foundries, glass-houses, nail-cutting factories, &c; establishments which are likely to expand and multiply as the small acorn, planted in a good soil and duly protected is to become the majestic oak....

Fearon’s Sketches of America also reflected on the overblown rhetoric used to describe industry in Pittsburgh.

The published accounts of this city are so exaggerated and out of all reason, that strangers are usually disappointed on visiting it. This, however, was not my case. I have been in some measure tutored in American gasconade. When I am told that at a particular hotel there is handsome accommodation, I expect that they are one remove from very bad; if ‘elegant entertainment,’ I anticipate tolerable; if a person is a ‘clever man,’ that he is not absolutely a fool; and if a manufactory is ‘the first in the world,’ I expect, and have generally found, about six men and three boys employed.

He took up the issue of which English town, if any, Pittsburgh was to be compared with.

He proposed Manchester rather than Birmingham because of “the humidity of its climate.”

Charles Dickens also remarked on Pittsburgh’s supposed likeness to Birmingham hyperbole when he visited Pittsburgh in 1842:

Pittsburgh is like Birmingham in England, at least its towns-people say so. Setting aside the streets, the shops, the houses, wagons, factories, public buildings and population perhaps it may be. It certainly has a great quantity of smoke hanging about and is famous for its iron works. It is very beautifully situated on the Allegheny river. Over which there are two bridges, and the villas of the wealthier citizens sprinkled about the high grounds in the neighborhood are pretty enough....

Pittsburgh was compared with the new British towns of the Industrial Revolution, especially Birmingham. Like such towns, Pittsburgh existed not for its own sake, but for the use that could be made of it. Instrumental rationality kept “Black Country” environmental standards low. Yet, Pittsburgh’s industrial future was secure only to the
extent that it could be assimilated to booming British towns. Argument, doubt, and
ejocularity concerning Pittsburgh’s likeness to Birmingham points to the precariousness of
Pittsburgh’s economic position. In this context, smoke could only be accounted as a
positive, adding to the appearance of a Birmingham-like industrial spectacle and
Birmingham-like economic stability.

As arguments over Pittsburgh’s assimilability to British industrial towns make
clear, the economic instability of the urban frontier was a central issue in Pittsburgh’s
early development. From the beginning Pittsburgh competed with other towns for river
trade, especially with Wheeling, since the greater depth of the Ohio River at Wheeling
made for superior navigation. Although Pittsburgh had bigger manufacturing capacity
and warehouses than Wheeling, the latter city was chosen by congress as the site at which
the National Road would cross Ohio River.71 The National Road reached Wheeling by
1820 and from that point Wheeling mediated Baltimore’s trade with the West,
significantly diverting commerce from Pittsburgh. Wheeling’s dominance would last
only until the local ascendance of the railroad, circa 1850, but between 1820 and 1830,
the rival city threatened to overtake Pittsburgh commercially. Wheeling’s advantage was
mitigated by the construction of other roads through Pittsburgh and the 1834 completion
of the Pennsylvania canal system. Nevertheless, recurrent transportation difficulties and
the re-configuring of the West by internal improvement weakened Pittsburgh’s privileged
position in trade and immigration throughout the period. As settlement moved west and
other routes of migration outstripped the Ohio River, and as steamboats enhanced the
commercial importance of other Ohio River cities, the precariousness of Pittsburgh’s
reliance on its strategic advantages became clear.72 By 1840 Cincinnati would surpass
Pittsburgh in population and in domination of Western commerce. By the 1870s, Chicago and St. Louis would eclipse Cincinnati itself as Metropolis of and Gateway to the West. In the face of declining commercial fortunes, Pittsburgh concentrated on manufacturing after the 1820s. In this way it distinguished itself first from Wheeling and then from Cincinnati, which while taking the lead in Western trade, remained commercial rather than manufacturing, cities.73

In 1830 Pittsburgh was considered by some to be the most important and promising manufacturing city in the United States, chiefly because of its coal supply.74 Despite its declining share of Western commerce, in 1832, the Scottish traveler James Stuart still called it “the great manufacturing city of Western America” and complained that “it would be a very delightful place of residence, but for the clouds of coal smoke which cover it and give a gloomy cast to the beautiful hills which surround it, and to all the neighboring country.”75 In the face of looming commercial decline, such environmental degradation was a well-justified sacrifice, since increased coal-based manufacturing was necessary to maintain the city’s economic equilibrium. If Pittsburgh was to remain a place in which wealth and power were concentrated, despite commercial competition, it would need to draw hinterland manufacturing to itself just as it had drawn hinterland goods to its central market depot. One can see in the development of the iron industry too, that Pittsburgh’s dominance was not a foregone conclusion.

Though iron-working was important in Pittsburgh from the beginning, iron-making in Western Pennsylvania was confined to the hinterland. The story of iron-making in Western Pennsylvania was not initially an important part of the history of the city of Pittsburgh, though blacksmiths worked in Pittsburgh from the beginning. Using
charcoal as fuel, George Anshutz established an iron smelting furnace in the borough in 1792, but it failed due to the difficulties of ore transportation. With the 1806 establishment of the Pittsburgh Foundry in the heart of the city, however, other metalworking establishments – foundries, forges, smithies, mills, machine shops and steam engine works – grew up quickly around it. Yet, all these establishments worked iron smelted in rural furnaces. In the 1830's Pittsburgh ironworks began to produce iron for new uses beyond both the needs and production capabilities of individual blacksmiths, especially for use in steamboat manufacture.

Higher hinterland iron productivity, due to coke-based smelting, spurred the urban adoption of the puddling process for remelting pig iron. As puddling came into general use in Pittsburgh soon after 1840, the iron industry boomed and smoke increased. More and more ironworks opened along the north side of the Monongehela River throughout the 1840s: G. and J. H. Schoenberger in 1841, Jones (Issac) and Quigg in 1845, Singer, Nimick and Co, in 1848. Charles Dickens visited the city in 1842 and noted the signs of industry in the hinterland increasing in density as he approached the city.

Pittsburgh’s development, even in the 1840s, still needed to be aggressively promoted. O. Ormsby Gregg sought to convince Eastern investors to bring their capital to Pittsburgh in a book-length real estate pamphlet published in 1845, Pittsburgh, her advantageous position and great resources, as a manufacturing and commercial city: embraced in a notice of sale of real estate. The point of the pamphlet was to argue for the advantages of the city based on its location and geology.
That our city is destined to be great with her now accumulated and yearly increasing wealth, if favored by Providence, can be determined by examining her geographical position on the map of the country; see if her vast advantages could be surpassed. In the midst of the richest mineral wealth in the world....

Gregg described the book length promotional works on the “locations and advantages” of other cities.

...with the advantages of capital that some Eastern and Western cities have enjoyed, her wealth and extent would have known no limits, neither has any trouble been taken to spread information respecting her as has been done by some cities...

The real estate to be sold was an undeveloped parcel that had been maintained as farm land while the city had industrialized around it. What Gregg produced was as much an advertisement for Pittsburgh as for his real estate parcel. He apologized for the length (forty pages) his “advertisement ha[d] acquired.” He went on to describe the waterways that connected to Pittsburgh’s rivers and canal and argued that this system of waters allowed for the transportation of goods “on terms beyond competition by all other present or prospective conveyance.” Gregg took the competition of the English and the French for control of the Forks as evidence of the “advantages of our position.”

Gregg complained about the irrational sheeplike way in which capitalists had attempted to supply the West with goods made in the East in places like Lowell and Lynn, “costing” he claimed “themselves and those customers...more unnecessary transportation than it would from here to New Orleans and back, a distance of four thousand miles.” Gregg celebrated the nearness of Pittsburgh’s factories and warehouses to its steamboat landing, and also promoted Pittsburgh on the basis of its abundant coal. He urged the building of textile factories in Pittsburgh as well as factories to make all sorts of goods for the West from molasses to carriages. The pamphlet listed the “[e]xtra
expenses incurred by the Manufacturer at the East over and above those at Pittsburgh, and by his customers.” Such expenses included the differences in the cost of transportation, real estate, insurance for shipping, and the cost of living for workers, including the cost of domestic fuel.

The pamphlet, beyond all these advertised the advantages of immediate access to western markets, argued that steam power was much cheaper than water power and quoted an article comparing the two from the Philadelphia Enquirer. It is evidence of the tenuousness of Pittsburgh’s hold, in the 1840s, on its industrial power that such arguments still seemed necessary. Gregg complained of a chronic lack of capital in Pittsburgh completely out of keeping with the city’s resource richness and the industriousness of its population.84

Gregg explicitly took on the question of the stability of Pittsburgh’s economy:

The first question with the Capitalist, is as to the safety of his investment; he can judge if the East can compete with us by a vast difference, and as to the West, while we have to supply her with nearly every bushel of coal they use, and the amount thus excepted, nearer their markets, being so much more expensive, both as to price and quality, there is no danger there.” 85

He argued that the cost of transporting coal was much higher than the cost of transporting other raw or finished materials and so took it to be the limiting factor in determining overall production costs. The article went on to argue for the importance of maintenance of the tariff. The prominence of this issue in early nineteenth century American politics is in itself evidence of the vulnerabilities of new American industry. Gregg emphasized the city’s stability: “Thus stands Pittsburgh, her property and rapid advancement secure, firm as the mountain...”86 He repeated his pleas for investment in Pittsburgh over and over in
his many pages: “Look to the advantages to be gained by the purchaser of property here, improvements, manufacturing, commerce and in all other pursuits...”

Gregg summed up Pittsburgh’s advantages as follows:

We repeat that, as is said of our city, she is destined to become one of the greatest manufacturing and commercial marts in the world; this is said already and not from a knowledge of her advantageous position, and rich resources only, but also of what she has done and without capital, as with scarcely an exception, her manufactures and merchants were not possessed of that advantage, but extended their business with their increased means.

Gregg’s promotion of the city becomes more understandable if one considers its manufacturing competition with the East, even in metals industries, and attends to the temporary and shifting character of its transportation advantages. Though Pittsburgh had held the monopoly on iron and glass for the Western market early in the nineteenth century, it had not yet surpassed the East in iron production. Manufacturing definitively eclipsed commerce as Pittsburgh’s commercial identity based on western trade was met with a final challenge: the coming of the railroads. Gregg had foreshadowed threats to Pittsburgh from railroads, but confidently dismissed them:

Our city possessing all these advantages, it can be seen that although canals and rail roads may radiate from Eastern cities in different directions, West and South of us to reach our markets, so long as we have the Ohio open for navigation to all, free of tolls and other expenses and objections attached to the former and at these low freights and fare and quick time, without coal, iron and all other advantages, we need not fear competition from any quarter, as to transportation, travel or manufacturing.

The spread of railroad transportation reduced the importance of Pittsburgh’s location at a strategic point on the nation’s water transportation network. By 1852, the Baltimore and Ohio and Pennsylvania Central Railroads had opened routes through Pittsburgh. Ironically, although the railroad boosted the Pittsburgh iron industry overall, it ended the
city’s monopoly on Western trade, both in iron and for other commodities. The 1850s brought not only railroads but a phenomenal growth in the iron industry to the city of Pittsburgh. On the basis of this industrial expansion, Pittsburgh’s population would grow by more than 500%: from 46,000 people in 1850 to 321,600 people in 1900.90

Until the 1850s there had been only iron foundries and rolling mills in the city. Iron was a large industry in Pittsburgh by the 1850s. By 1857 the city had 25 rolling mills and 16 foundries in addition to re-heating furnaces: 50 ironworks of various kinds in all employing 8000 men. Still, however, Pittsburgh ironworks used ore smelted in the country. The quality and quantity of iron required by iron rail mills eventually led Pittsburgh iron makers to search for an alternative source of pig iron to the rural furnaces that had always supplied them. The answer was to make pig iron in the city itself. Pittsburgh would become the center of vertically integrated iron production. As Pittsburgh’s role in transportation for trade was threatened with the coming of the railroad, successful merchants shifted their energies to manufacturing. In 1850, German immigrants, Benjamin and Francis Lauth built an iron rolling mill on the south side of the Monongehela, but needed more capital. To get it they approached iron merchants Jones and Kier who became partners. Jones and Kier had already left the failing packet business and become specialized iron merchants in the face of the general decline in river trade. During the 1850s and 60s this partnership too needed more capital to expand into blast furnaces. They approached James Laughlin, another merchant who had bailed out of the declining Western river trade in immigrant-provisioning to sell iron. The resulting company established the first integrated iron works in the city. By 1857 they had blast furnaces to make pig iron, thirty-one puddling and heating furnaces to refine it, five trains
of rolls and twenty-five nail making machines. Jones, Keir and Laughlin’s blast furnaces were the first in the city since the 1792 Anshutz furnace had failed because of the difficulties of transporting ore into the city. The new furnaces used ores from the Allegheny Valley, and from as far away as Missouri and Lake Superior. They relied on coke for fuel, since wood was not so plentiful near the city as it had been in the 1790s.

In the 1860s a manufacturing census of Pittsburgh shows tremendous activity. Industrial use of space expanded within the city and beyond its boundaries. Jones and Laughlin constructed its Eliza furnace in 1860 – the third iron furnace in Allegheny County. They were soon joined by Andrew Carnegie. The Allegheny River from 11th to 60th streets became the site of the Carnegie Mills beginning in the 1850s and 1860s. Carnegie began as an investor, but by the 1860s acquired control of the direction of the companies in which he had invested. In 1864 he established the Cyclops Iron Mill, developed from the Keystone Bridge Company, followed by a whole string of new iron making companies through the early 1870s. Carnegie’s iron empire would create the city he would proudly show off to Herbert Spencer in 1882, only to be met with the response that six months residence in Pittsburgh would justify suicide.

1.4 Dissonance

Beneath shrill promotion of Pittsburgh’s advantages, discontent with the environment and other dissonant strains could be heard. Not only travelers commented on Pittsburgh’s environmental degradation due to the growth of industry. From earliest times, Pittsburghers also remarked on their smoke and some regarded it as a problem.
By 1804, coal smoke had already become a nuisance to some in Pittsburgh, as burgess General Presley Neville complained to George Stevenson, the president of council:

The general dissatisfaction which prevails and the frequent complaints which are exhibited in consequence of the Coal Smoke from many buildings in the Borough particularly from Smithies and Blacksmith Shops, compels me to address you on this occasion. I would be extremely sorry to subject any of our fellow citizens to unnecessary or useless expense, but in this instance not only the consequence of the place, but the peace and harmony of the inhabitants depend upon the speedy measures being adopted to remedy this nuisance.97

Burgess Neville suggested higher chimneys so that “the smoke could be voided into free air and carried beyond the limits of the borough.”98 When Pittsburgh was incorporated as a city, in 1816, one of its founding ordinances was aimed at regulating the discharge of smoke from homes and workshops. One object of the ordinance was to prevent fire danger from chimney sparks. The prevention of smoke as an inconvenience, however, was an equally important goal, as the following excerpt on industrial chimneys makes clear:

...that chimneys of smith-shops, nail-shops, forges, furnaces, foundries, glass-works, and steam engines, shall not only be carried up to such a height as to avoid danger of fire, but shall also project and be carried up in such a manner, and at such a distance, that passengers on the squares, streets or alleys of the said city, and that of the neighbourhood shall not be incommoded by the smoke issuing from the same, and that the smoke, in ordinary weather will be carried off as well and sufficiently as the nature of its element will admit of. And that when houses of different elevations adjoin each other, the chimneys of the lower house shall be carried up in such a manner and of such a height, as that the sparks, fire or smoke which might issue from the same shall not bespoil injure or disfigure the work of the adjoining house and that no pipe or flue from any steam engine or steam works, shall project over or into any square, street or alley of the said city.99

The ordinance specified a fine of ten dollars per month of violation.
Despite such civic efforts, frontier standards militated against the enforcement of traditional urban protections against pollution. Zadok Cramer complained, in his guidebook, of Pittsburgh’s smoke:

As every blessing has its attendant evil, the stone coal is productive of considerable inconvenience from the smoke which overhangs the town, and descends in fine dust which blackens every object. Even snow can scarcely be called white in Pittsburgh. The persons and dress of the inhabitants, in the interior of the houses as well as the exterior experience its effects. The tall steeple of the court house was once painted white, but alas! How changed. Yet all this might be prevented by some additional expense on the construction of the chimneys. In the English manufacturing towns, a fine is imposed upon those who do not consume their smoke. In calculable would be the advantage to this place, could such a regulation be adopted. The advantages of cleanliness, and even health, not to mention the improvement in the azure of the sky, and the light of the sun and moon, ought surely to rouse the public spirit of the inhabitants.100

Travelers remarked on the contrast between Pittsburgh’s strategic and manufacturing importance and its lack of civic presence.

Thomas’s Travels Through the Western Country in the summer of 1816 described Pittsburgh’s smoke:

Pittsburgh was hidden from our view, until we descended through the hills within half a mile of the Allegheny river. Dark dense smoke was rising from many parts, and a hovering cloud of this vapour, obscuring the prospect, rendering it singularly gloomy. Indeed, it reminded me of the smoking logs of a new field.101

Thomas was eager to leave the city: “...we left Pittsburgh with all the joy of a bird which escapes from its cage ‘From the tumult, and smoke of the city set free’...”102 In 1815 William Darby, member of the New York State Historical Society and author of books of geographical description of North America, wrote of Pittsburgh in his in his Emigrant’s Guide to the Western and Southwestern States and Territories: “Pittsburg is in every respect the principal town, not only of the Ohio valley, but, New-Orleans excepted, of the whole waters of the Mississippi.” But, he noted: “Travelers are almost always
disappointed on entering this city... because ...the city is literally a workshop, and a 
warehouse for the immense country below....” Despite its supreme importance as an 
trepor, Pittsburgh was not a Great City in its own right. He noted the presence of iron 
foundries, glasshouses and numerous other manufacturing operations and called the scale 
and extent of Pittsburgh manufacturing “a real phenomenon.”

Nonetheless, he remarked:

Except the gratifying reflection arising from the review of so much plastic 
industry, Pittsburgh is by no means a pleasant city to a stranger. The constant 
volumes of smoke preserve the atmosphere in a continued cloud of coal dust.

Darby described, in this way, a city that by 1817 had 259 factories of all types employing 
1637 men. Yet, Darby’s reaction to Pittsburgh was marked by the same ambiguities 
that would characterize responses from later writers. Darby compared Pittsburgh’s 
current appearance to George Washington’s 1754 description of the Forks.

....When the reader.... casts a retrospective glance upon the history of the last 
seventy years, and recalls the days of the youth of WASHINGTON; ...he reviews 
the events that have changed, ....[omitted: “not only”] this, then dreary waste, to a 
smiling picture of active industry and domestic happiness....

For Darby manufacturing allowed domestic virtues to triumph over the violence and 
wa of what had once been wilderness. As we will see below, Pittsburgh’s industry, and 
by extension, its industrial pollution, could stand both for the virtues of domesticity and 
civilization and for the virtues and vices of the frontier.

In 1816 traveling Boston clergyman, Timothy Flint wrote of Pittsburgh’s post-war 
decline highlighting important themes that would dominate Pittsburgh’s struggle for 
identity for much of the nineteenth century.

Pittsburg is a considerable town... and has been so often described as to render 
uninteresting any attempt of the kind. The site is romantic and delightful. It is
well known as a manufacturing place, and once almost supplied the lower country
with a variety of the most necessary and important manufactures. But the wealth,
busines, and glory of this place are fast passing away, transferred to Cincinnati,
to Louisville, and other places on the Ohio. Various causes have concurred to this
result; but especially the multiplication of steam-boats and the consequent
communication with the Atlantic ports by the Mississippi. There is little prospect
of the reverse of this order of things. The national road, terminating at Wheeling,
contributes to this decay of Pittsburg. Her decline is not much regretted, for she
used to fatten on the spoils of the poor emigrants that swarmed to this place....The
traveler was too apt to think of her as immersed in “sin and sea-coal;” for the
constant use of fossil coal both for culinary and manufacturing purposes, has
given a sooty and funereal aspect even to the buildings....

It has been said, that the decay of the business of this place has been
connected with its moral improvement, and that in moral and humane institutions,
and in the urbanity and kindness of manners, it now holds a respectable
competition with other places....

As Flint’s observations make clear, Pittsburgh’s struggles after the war took place
in the context of rivalry with other cities of the Ohio and Mississippi. Tensions
between urban and frontier identities shaped this competition and the cities themselves.
Pittsburgh, and after it Louisville, Lexington, Cincinnati and St. Louis were frontier
places not purely of the frontier because they were also cities, intentionally established
seats of culture in the midst of wildness. As such, they were subject to the “civilized”
moral ideals on which Flint’s criticisms rested. The cities of the urban frontier were beset
with tensions between the intentional character of the city and the accidental nature of the
frontier. They were proud of their roughness, newness, instrumental rationality, and the
breaking of old rules but also of their new churches, academies and other institutions by
which they could claim to be centers of civilized life.

Despite complaints about environmental degradation and moral corruption, some
Pittsburghers in 1818 still appreciated the richness of the natural setting. John Wrenshall
wrote a sentimental poem “Farewell to Pittsburg and the Mountains” and had it published
in that year. Returning to the East with his three daughters after the death of his wife, he wrote of his Pittsburgh home in maudlin pastoral terms:

Adieu, that garden, where we oft did cull
Where lilacs’s flourish, blushing roses stand,
Or peep above the grass, on either hand:
Where busy bees, and humming birds regale,
And chippers pick, and tell their little tale.
Here grassy banks, array’d in lively green,
And sloping paths are introduc’d between:
With privet hedges, and sweet-scented flowers.
Inviting spot, to spend our leisure hours.
Adieu, thou sweet retreat, we shall no more
Ascend they banks, or they neat paths explore.
And thou Grant’s hill, whose surface we have trod,
To view the city, and that house of God
At whose firm base, my much lov’d Mary lies....

He goes on to connect the city’s abundant coal to its beautiful hills, yet the darkness prominent in his descriptions of coal mining contrasts with the images of sunlight and flowers in the poem’s first stanza.

Ye lofty hills, which guard the city round,
Where once, untutored savages were found,
Beneath your surface, hid from mortal eye
Rich mines of coal, as in a store-house lie;
And men with murky visage, oft explore,
Your dark recesses for a winter’s store–
To warm our dwellings, and to gain their bread,
‘Tis better thus, than supperless to bed;
‘Tis better far, that men with honest toil,
Subsistence gain, then cunningly beguile...

Like Cuming and Cramer, Wrenshall connects abundant coal with freedom from want. He calls attention to Pittsburgh’s industrial spectacle and to its smoke. It seems extraordinary that he can be describing the same city. Yet Wrenshall’s poem is an extreme example of the pattern we have already seen in which natural beauty, abundant
coal and what our contemporary sensibilities would call industrial defilement, are seamlessly connected.

Between the rivers, Pittsburg city stands,
Focus, where strangers meet, in quest of lands;
Thence soon diverging, spread the forest o’er,
Or fix their station, nigh some river shore.
Here furnaces, emitting flames of fire,
And clouds of smoke o’er top the city spire;
With noisy engines puffing out their steam,
For uses varied, which we need not name.
These all evince, what Pittsburg soon will be,
The seat of useful manufactory....

Another theme, often connected with these, runs through the poem as well: the valorization of “honest toil” contrasted to speculative financial manipulation through which one might “cunningly beguile.” Wrenshall suggests, and his theme recurs in other writings about the city, that such human virtue is connected to Pittsburgh’s environmental parameters.

Yon busy strands, where sturdy barge-men meet,
And merchants, more polite, each other greet;
And strangers too, who oft assemble here
...he will e’r long
Acquire a competency, for his toil,
And all the onsets of their malice foil;
A cup of water, or a piece of bread.
Bestow’d in love, to cheer the drooping head....  

Wrenshall links, as other writers would, industrious employment in the beautiful city of industry with virtuous labor, to be rewarded by acquisition of “a competency” – the degree of financial independence requisite for upstanding republican citizenship and civic virtue.

Seemingly contradictory elements of Wrenshall’s poem were commonly associated. The same Grant’s Hill Wrenshall refers to above is the vantage point that
would be mentioned in James Hall’s *Letters from the West*, from which, by 1828, both
nature and the spectacle of Pittsburgh’s smoke could be viewed. Hall described
Pittsburgh as seen from Grant’s Hill in 1828:

...[it] affords one of the most delightful prospects with which I am acquainted;
presenting a singular combination of the bustle of the town, with the solitude and
sweetness of the country. How many hours I spent here, in the enjoyment of those
exquisite sensations which are awakened by pleasing associations and picturesque
scenes! The city lay beneath me, enveloped in smoke – the clang of hammers
resounded from its numerous manufactories...Behind me were all the silent soft
attractions of rural sweetness...113

Neither travelers nor Pittsburghers were of one accord about Pittsburgh’s
environment. In November 1823, a reader wrote a letter to *The Pittsburgh Gazette and
Manufacturing Advertiser* complaining about smoke. The letter writer took smoke as the
unpleasant underside of the great good of the return of industrial prosperity after the post-
war depression.

We, the citizens of Pittsburgh, glory in this moment, with much reason, in the
increase of our manufacturing industry, reviving as it were, from its lethargy.
Almost every month gives us the cheerful spectacle of some new establishment
springing into life, and shedding its beneficial influence over our city. But at the
same time the increased number of chimneys, pouring forth dark and massive
columns of smoke, begins to be felt as an almost intolerable nuisance. The sun
has almost ceased to illume us with his bright and serene rays. The sooty effluvia,
mixing with the gauze of vapor which too often overspreads the beauties of our
landscape, seems to envelope us with a mantle of darkness.114

The letter writer recognized the effects of habituation to smoke on Pittsburghers and the
common negative reaction of travelers.

Though we, the inhabitants of the place, taught by habit, breathe and move in this
unpalatable atmosphere with as much facility as fishes are breathing and moving
in the water, yet we hear many a stranger, endowed with less complaisant organs,
curse our city, our coal and our industry.115
The letter writer also complained of the effects of soot on buildings, household furnishings and on need for continual clothes-washing made necessary by it. He disparaged the instrumentalist approach to the city taken by Pittsburgh businessmen:

Let the calculating speculator drown every other sensation in the computation of the dollars which the active industry of our citizens will throw into circulation; for my part, I rejoice in beholding the face of nature unveiled and unshrouded. I delight in drinking the genial air of Heaven; I am pleased with the aspect of cleanliness in the exterior as well as the interior of our dwellings, and...I like...to see my wife moving about in those snow-white garments which are so true an emblem of her heart.\textsuperscript{116}

The letter quoted from a "recent periodical publication of the highest scientific respectability" promoting tall chimneys not only to carry the smoke above and away from the town but to allow more time for the consumption of the products of incomplete combustion. The article he quoted from claimed that such chimneys would also allow a cheaper grade of fuel to be used and would make fireplace cleaning less necessary. He suggested that very tall chimneys be made of sheet iron to prevent their being blown down in storms.\textsuperscript{117}

In 1830 smoke again became a public issue, as councils established a committee to draft an ordinance to prescribe \textit{specific} heights for industrial chimneys, building on the initial chimney ordinance of 1816 (see above).\textsuperscript{118} The consolidation of urban ironworking and its new fuel requirements would eventually have further environmental consequences. The rural iron industry relied on charcoal as fuel, but urban ironworking used coal and eventually coke. Coke was produced in Pittsburgh by 1813 and by 1833 there was a "row of coke ovens at the base of coal hill."\textsuperscript{119} Although most coke-making would eventually be transferred out of the city and into the surrounding region, particularly to the Chestnut Ridge area, it was still being attempted in Pittsburgh in the
1840s. In 1849 councils debated an ordinance prohibiting the construction of coke ovens and brick kilns within city limits.\textsuperscript{120} Pittsburgh smoke came in for national notice when in 1845 \textit{Scientific American} ran a little blurb joking about the phenomenon. Under the heading “The Iron City” it said:

In some parts of Pittsburg the cinders and soot from many furnaces so pervade the atmosphere that they often fall on the faces and dresses of the ladies as they walk the streets. The only remedy in such cases, is to blow off the flakes of soot, as an attempt to wipe them off would only make matters worse. Hence it is said that the ladies of that city often come to \textit{blows}.\textsuperscript{121}

The increased importance of manufacturing in Pittsburgh’s economy was a direct consequence of the city’s attenuated dominance of Western trade. Nonetheless, Western ideology would continue to shape the Pittsburgh environment. Environmental attitudes in Pittsburgh were formed in part by the instrumental rationality of the frontier: the idea that the old strictures of civilization were left behind in cultivated places, that means did not have to conform to traditional rules, so ends could be pursued more freely. This made environmental standards negotiable and traditional environmental expectations of civilized life subordinate to the ends of material gain or individual desires. Abundant resources in the context of former scarcities become contested resources. If the contested resources are located in a place that does not exist for its own sake, a place that is to be approached instrumentally, disregard for the environmental consequences of human action becomes increasingly likely. Pittsburgh’s smokiness was appropriate for a place on the boundary, where old rules did not apply. It is no accident that American environmental history is closely linked with Western history.

As Pittsburgh’s industrial growth continued, smoke became a symbol of the city’s distinctive character. Smoke and instrumental rationality were connected by various parts
of the frontier ethos itself. Frontier primitiveness justified the putting aside of environmental standards. The eschewal of luxury and comforts associated with a single-minded devotion to money-making fit well with the robustness and masculinity of frontier mythology. Yet, because Pittsburgh was not just a slice of the agricultural or military frontier, but a frontier city, conflicts over smoke arose as part of conflicts over its identity as a city. Boosters worried that the future of the city would be hurt by smoke.

Real estate promoter Gregg portrayed Pittsburgh in 1845 as a place both of civic amenities and of industry. He describes:

...her extended streets, her splendid public and private edifices, her wholesale stores and ware houses of goods, manufactories innumerable, canal boats and basins, water and gas works, her five splendid bridges, including the beautiful wire suspension aqueduct, her river landings lined with splendid steamers, canal boats, arks, rafts &c and enlivened by there constant arrival and departure, the busy populace in her thronged streets, quays and workshops the illumination of her brilliant gas lights and numerous furnaces, the roar of her blasts and forge hammers, hum of machinery, purr of the powerful engines, and ringing of bells calling her multitude of operatives to their posts, to be seen and heard around her, and the clouds of smoke continually ascending over her, proclaim her prosperity and giant onward course.122

The 1840s were a tumultuous decade for Pittsburgh. While its population had grown steadily throughout the nineteenth century, during the 1840s alone it more than doubled.123 As Pittsburgh’s industrial growth continued, smoke became the emblem of the city’s distinctive character. By the 1840s, Pittsburgh was “the Smoky City.” Charles Dickens, who visited Pittsburgh in 1842, described it unfavorably in his American Notes:

Furnace fires and clanking hammers on the bank of the canal warned us that we approached the termination of this part of the journey. After going through a dreamy place, a long aqueduct across another Allegheny river...we emerged upon that ugly confusion of back buildings and crazy galleries and stores which always abuts on water, whether it be river seas, canal or ditch and we were in Pittsburgh.124
Pittsburgh’s smoke was associated with urban sins: greed, intemperance, lack of charity. As early as 1807 Fortesque Cuming had complained of Pittsburghers’ obsession with money-making. Eastwick Evans in 1818 warned that its inhabitants were “very attentive to their business, and seemed to care but little about those around them.” Pittsburgh’s industrial smoke was evidence of immersion, as Timothy Flint said, in “sin and sea coal” – of over-concern with money making, of neglect of charity among the well off and of the decline of morals in the heterogeneous mobs who came to work in the city’s mills. In Pittsburgh the sins of Sodom and the dangers and mystery of the fires of artifice were brought together in one place. Smoke was a symbol both of desirable frontier roughness and undesirable urban corruption. The Smoky City: A Tale of Crime, a novel published in Pittsburgh in 1845 associated both the smoke of industry and the smoke of Pittsburgh’s 1845 Great Fire with the forces of sin in the city. The novel promoted temperance alongside Christian charity as manly virtues. At this very time temperance reform had taken hold in Pittsburgh. In 1837, a community known as “Temperenceville” had been established in the steep hills to the city’s southwest. This was an unusual expansion, in that it lay outside the eastward path of most of Pittsburgh’s residential development and of most of its industrial smoke.

Although the frontier context set the tone for the acceptance of smoke-making, Pittsburgh, in its aspiration to be a city, not just an undifferentiated slice of the frontier, had claims against some of the components of the frontier ethos that made smoke-making acceptable. A city whose future was tied to its own character and not just to the opportunities to be pursued within it could justly complain about smoke as a factor that made it ugly, or unhealthy or uncomfortable for inhabitants and visitors. As a seat of
culture, and with it, taste, comfort and beauty, a city could defend these values against
degradation by smoke. Pittsburgers did just this as railroads threatened to carry their
mobile smoke, noise and danger through the city. In the 1840s and 1850s city councils
attached regulations to railroad charters requiring locomotives to use clean-burning coke,
or whatever other fuel councils specified, within city limits.128

In 1846 the Pittsburgh Chronicle ran a brief article lamenting the degraded
environmental condition of Coal Hill.

Coal mines, stone quarries and railroads have sadly marred the beauties of this
noble barrier to our view towards the West. In the days of its glory, which
covered with trees from summit down to the edge of the water, it was the fairest
portion of our surrounding scenery. But, now how changed! At its base vast
furnaces belch forth dense clouds of flame and smoke, its steep side has been cut
down by large quarries, and all along near it stop a dozen yawning throats pour
down a dozen railroads its rich treasures. Tree and shrub have been reft from their
fast hold, and the old hill now stands before us with scarred sides and almost
shaven crown.

We love that hill, and when ever we turn our gaze upon it a thousand
pleasing recollections flit across the memory. Our foot has pressed a hundred
times upon almost every inch of its summit. Every knoll from which the eye can
gaze upon the scenery below, and every grove and clump of trees with their cool
shade, has its pleasing associations, and we feel half sad to see the old hill bereft
of its glory. But this is a matter of fact world and we live in a money-getting,
money-loving generation and the beautiful must give place to the useful.129

The columnist laments the destruction of the hill that he knows and loves. Yet, in the end,
after criticizing the current “generation” and “money-getting” and “money-loving” he
takes that generation’s judgement as necessary and accepts its determination that “the
beautiful must give place to the useful.”

Pittsburgh’s industrial identity was consolidated after the Civil War.
Manufacturing boomed and smoke levels rose precipitously. Reassertions of
environmental regulation on the city’s ordinance books provide counterexamples to
claims of the universal acceptability of smoke in this era. Rising environmental concern is evident in new railroad fuel regulations and coke oven ordinances. Coke ovens within city limits were prohibited by the 1860s, whereas in the late 1840s such measures had merely been debated in councils. By 1869 the ordinance books carried a law prohibiting the emission of any smoke at all by locomotives within city limits, an ordinance much stronger than those attached to railroad charters in the 1840s and 1850s. While the ordinances passed seem to have been little enforced, the 1860s nonetheless appears to have been a time of increased environmental concern in Pittsburgh. Petroleum, long since noted as imparting a volatile quality to some local streams, had recently been exploited commercially in the region. This brought a great deal of petroleum to the Ohio’s headwaters in the form of sometimes leaky barrels carried by sometimes leaky boats. Regulations prohibited the leaving of petroleum barrels empty or full on the wharfs of the city. While the concern here may have merely been with fire, in the context of other ordinances prohibiting the dumping of coal tar into the rivers and controversies over fish dieoffs, the petroleum barrel ordinances, together with the smoke restrictions, point to heightened environmental concern in the Smoky City. Environmental dissatisfaction in Pittsburgh showed itself in another way as well. Suburbanization in Pittsburgh was early and rapid. The first streetcars began running in 1859.\textsuperscript{130} By 1860 the inclines began to provide transportation up and down Pittsburgh’s hills,\textsuperscript{131} out of the city’s smoky valleys. Despite all of this evidence of increasing environmental sensitivity in the city, however, smoke from the expanding iron industry was not directly attacked.

Despite the often repeated claims of Pittsburghers and Pittsburgh physician William Denny that Pittsburgh smoke was anti-miasmatic and functioned as another civic
advantage, general medical opinion, from the early to mid nineteenth century, saw smoke as harmful to health. Medical articles from the period reflected concern with the influence of bad air on the human body. British articles from 1866 and 1867 explicitly took up questions of smoke and health, and Benjamin Franklin’s 1787 letter to the physician to the emperor at Vienna on “the causes and cures of smoky chimneys” discussed the matter. Articles such as Edmund Davy’s 1818 discussion “Experiments and Observations upon the State of the Air in the Fever Hospitals of Cork...” focused on the effects on health of the amounts of oxygen and carbon dioxide in the air. This article noted that both animal respiration and “the burning of coals, wood, candles &c” brought about the conversion of oxygen to carbon dioxide. Davy was unable to confirm, however, that the air of crowded streets, houses, theaters and hospitals contained a lower proportion of oxygen to carbon dioxide than outdoor air in salubrious situations. Despite Davy’s failure to demonstrate differences in oxygen levels in air subject to excessive respiration and combustion, concern with “vitiated air” persisted throughout the nineteenth century. An 1844 article “On the Injuries to Health Occasioned by Breathing Impure Air in Close Apartments” in the London Medical Gazette complained of air vitiated by the “hundreds of candles” burning in evening meetings of the House of Commons. The author consistently paired vitiation of air by human respiration and by combustion for light and heat. He exhorted the press and reformers to take up a crusade analogous to temperance (which he took as coextensive with the promotion of pure water as the most desirable beverage) for “the advantages of inhaling with equal purity the lighter fluid.”
W. Frend, affiliated with the Actuary of the Rock Insurance firm, wrote about the health dangers of London’s smoke in 1819. Particularly concerned with industrial emissions, Frend assumed that smoke had negative health effects and spoke of air “infected” with smoke from both lead smelting and iron melting. He remarked that “medical men are the best judges” “on the mischief arising from noxious vapours.” Frend’s solution was the regulation of chimney heights so that they would “bear some proportion to the quantity of coals consumed beneath them.”

In 1868 Dr. George Derby, Boston City Hospital Surgeon, public health official and lecturer at Harvard, published “An Inquiry into the Influence of Anthracite Fires on Health.” Bituminous coal, however, sometimes appeared as a more benign alternative to newly-exploited anthracite, used in East Coast cities after the interruption in importation of British bituminous by the War of 1812. Derby’s treatise viewed bituminous coal, like that of Pittsburgh, as “as a far less dangerous substance in the products of its combustion than our anthracite.” Nonetheless, discussion of the dangers of anthracite – chiefly the production of carbon monoxide and its release indoors through porous cast iron stoves – exhibited knowledge of the connection between incomplete combustion of coal and objectionable emissions. In addition, discussions of anthracite emissions linked complete combustion with fuel economy and demonstrated a sophisticated grasp of both the chemical composition of the combustion by-products and of the damage to vegetation possible even from invisible pollution.

An 1846 editorial from the American Railroad Journal illustrates expert understanding of smoke abatement technology at mid-century. The article consists of extracts from a report made to the British government by the chemist Lyon Playfair and
the geologist Henry De la Beche. It claimed that smoke abatement principles were well-known, and attributed smoke to incomplete combustion. The article recommended sufficient air and sufficient temperature to ensure complete combustion and produce only “colorless and invisible” gases that “do not come under the definition of the term smoke.” It argued that complete combustion should theoretically bring about fuel savings but that this was not always so in practice. Usually in smoke abatement, the author stated, cold air would be introduced into the fire and would then need to be heated up to the temperature of the fuel. The energy lost to the heating of the air would be equal or greater than the fuel savings, however. The article continued:

This [practice] often results in the careless use of furnaces constructed on the principle of smoke prevention, and thus leads to the contradictory statements given by those who have used such furnaces. But in all carefully conducted experiments the saving of fuel has been considerable....

In this way the author acknowledged that it was not only technology but human practice that determined smoke emission, and that variations in human practice could lead to uncertainties in physical knowledge. The article noted that the combustion of carbon that would otherwise escape in carbon monoxide was the chief object of smoke prevention. It also identified improper boiler and fireplace construction, deficiency of draught and careless stoking as the three main causes of smoke.

While the article’s authors saw smoke as unnecessary, they were reluctant to recommend legislation prohibiting all smoke emission. Nonetheless, they did support restriction of smoke from steam engines and “other cases...such as distilleries, dyeworks etc...” already regulated locally (in Manchester) “in which processes for the prevention of smoke have...proved successful.” The article continued, however:
there are certain processes in glassworks, iron furnaces, and potteries in which it is neither possible nor desirable to apply a general law for the prevention of smoke although the nuisance may be partially mitigated, by causing the steam engines employed in them to be so constructed as not to emit smoke.\textsuperscript{139}

The article/report provides evidence that many of the ideas that would form the basis of smoke abatement efforts into the twentieth century were already current in the mid-nineteenth. Equally its plea for the exception of metal and glass-working furnaces would provide a basis on which arguments against the regulation of Pittsburgh’s most basic industries could be made. Reviewing opinions of experts on both sides of the ocean, it is clear that no universal ignorance of the effects of smoke and the mechanics of prevention doomed Pittsburgh to its fate. It was not, then, from a simple lack of technological understanding that Pittsburgh remained smoky. The explanation for Pittsburgh’s persistent smokiness, while not independent of intertwined material and epistemological factors, was also determined by ideological and symbolic ones.

1.5 Frontier Ideology

Despite the dissonances evident in anti-pollution ordinances, complaints about Pittsburgh’s lack of civic culture, acknowledgments of possible damage to health from bad air, and claims to understand the science and technology of smoke abatement, Pittsburgh remained America’s smokiest city well beyond the mid-nineteenth century. The frontier mythology that condoned smoke-making, though malleable, was remarkably persistent. While such ideologies have many variations, I will summarize below those aspects most relevant to the shaping of Pittsburgh’s civic self-conception. Frontier ideologies condoned environmental degradation primarily by constructing places as having a great deal of extrinsic and instrumental value but little intrinsic worth – as
places with no necessary existence. The identity of a frontier place was unstable because it was extrinsically defined and reflected instrumental valuations. Several related characteristics of frontier ideology contributed to this construction of Pittsburgh. Aspects of frontier ideology as operative in Pittsburgh’s early years can be broken down as follows.

(1) Frontier as boundary.
A frontier is extrinsically defined and valued: it is defined by the regions on either side of it and valued because of its role in maintaining their relationship to one another. The identity of frontier places is precarious because it is extrinsically defined. Further, the frontier, as a boundary, is not contained within the bounded regions or constrained by their characters. Old rules of the civilized bounded spaces don’t apply at the frontier.

(2) Frontier as disposable.
Civilized places existing for their own sake, and for the sake of larger values, were rejected by those who left for the frontier. Frontiers themselves become disposable places, potentially like older settlements left behind in migration. This is especially true in America where ideas of successive frontiers were important even before explicit avowals of Manifest Destiny.

(3) Frontier as temporary.
Contingency (based on extrinsic valuation) and disposability combine to make frontier places, at least potentially, temporary. As extrinsic conditions change, the frontier changes or disappears: boundaries between shifting regions are temporary. As the boundary of settlement moves to another place, the former frontier can become either a
settled place or ghost-town. The transient nature of frontier populations adds to the temporary character of frontier settlements.

(4) Frontier as primitive.

Frontier society is taken to be at an earlier, more basic stage of “development.” Comfort, art and cultural amenities are rejected as inessential luxuries. This rejection of the inessential was linked with the frontier’s instrumental rationality and its primitiveness with an ethos of masculinity.

Many of the themes and issues important in Pittsburgh’s first eighty years were brought together by biographer James Parton in his 1868 Atlantic Monthly feature “Some of the Wonders of Pittsburgh.” I will place his article in local and national context in the next chapter. Here, however, I introduce it in order to illustrate how smoke could be used to highlight tensions between Pittsburgh’s urban and frontier, manufacturing and commercial identities. Parton spoke of the coke ovens of Pittsburgh as announcing the city’s “peculiar character” from a distance: those who approached the city at night would see their “firey eyes” on the hills surrounding it. He imagined Pittsburgh as a Vulcan or Hades “at work behind those fires, naked to the waist with hairy chest and brawny arms, doing tremendous things with molten iron, or forging huge masses white-hot amid showers of sparks.” Impressed with Pittsburgh’s industrial might, Parton spoke of “substances subjugated.” He celebrated the city’s embodiment of modern man’s mastery of nature and saw it as offering “the kind of education demanded by modern times,” an education in technology and political economy. Yet, for Parton, Pittsburgh was both a city of the future and a city of the past. It sat on a temporal as well as a spatial boundary, like the frontier itself. Parton saw Pittsburgh as a city on the border of America’s
principal regions, neither East nor West, neither North nor South, beyond sectionalism and hence beyond contemporary American struggles. Although Parton’s Pittsburgh was a city of the future, Parton used anachronistic rhetoric to celebrate its character. He emphasized Pittsburgh’s frontier identity and linked the ideology of the frontier to the rhetoric of republicanism. In this way, the city, like the frontier, was both ahead and behind the times, both an incursion into new territory, and in its primitive conditions, a recreation of an earlier stage in human development. Smoke functioned centrally for Parton in creating these contradictions in the city’s character.

Smoke and industry enforced republican virtue in the city. Parton credited the city’s extreme pollution by bituminous coal smoke for the manliness of its men and the absence of frivolity among its women. He linked masculinity with virtuous industry and the rejection of luxury, and femininity with the frivolous enjoyment of material goods – especially clothing and domestic furnishings. During the American Revolution, republican virtues of industry and frugality, long considered paradigmatically male, were embodied in the patriot women who made homespun and did without imported luxuries. By the time of Parton’s writing, republican ideology had largely been replaced by new ideas of virtue, feminized and sentimentalized as evangelical religion eclipsed Calvinism. Women’s virtue consisted less in productive and frugal housewifery, and more in the exercise of maternal power in the raising of virtuous citizens. Parton, nonetheless, drew on the older conceptions of virtuous republican womanhood to describe the women of Pittsburgh. For Parton, conceptions of gender, work, virtue, and environment were tightly intertwined:
From some of the expensive foibles of human nature the people of Pittsburg are necessarily exempted. There can never be any dandies here. He would be a very bold man indeed who should venture into the streets of Pittsburg with a pair of yellow kids upon his hands, nor would they be yellow more than ten minutes. All dainty and showy apparel is forbidden by the state of the atmosphere, and equally so is delicate upholstery within doors. Some very young girls, in flush times, when wages are high, venture forth with pink or blue ribbons in their bonnets, which may, in highly favorable circumstances, look clean and fresh for half a mile, but ladies of standing and experience never think of such extravagance, and wear only the colors that harmonize with the dingy livery of the place.140

Parton’s republican language, somewhat out of place in 1868, was a reference to the nation’s idealized past. Parton uses republican rhetoric advisedly, however, portraying Pittsburgh as a last bastion of republican virtue, a Western and Presbyterian place – both technological frontier and moral backwater.141 For Parton, smoke determined civic identity as embodied in local customs centering around industry: Pittsburgh’s entire material culture was shaped by labor through smoke. Smoke was labor’s product – it enforced, for both men and women, a preference for industry over luxury – virtue over sin. The close association of virtue with frugality and the eschewal of domestic and environmental amenities made early attempts to oppose smoke on moral grounds difficult.

Yet, as we have seen, beneath protestations that smoke was Pittsburgh’s essence, and jovial dismissals of the discomforts and drudgery it imposed, discontent with Pittsburgh’s environmental conditions bubbled. As we will see in the next chapter, Parton used his discussions of smoke, health, and suburbanization to point to tensions within the conception of Pittsburgh as a smoky and harmonious republic of free and equal industrious producers.
At the end of the 1860s, Pittsburgh sat on a temporal and spatial boundary –
between East and West and between Old and New in America. Its history of marking
spatial division would continue to shape its environmental conditions, environmental
attitudes and civic ideology. Nonetheless, factors transcending this history would
eventually come together to reshape environmental attitudes in Pittsburgh. The influence
of a feminized mid-century morality would shift the balance between instrumental and
intrinsic, capitalist and civic, ideals for the city, building on long-standing tensions
between frontier and metropolitan values. Ironically, these changes would be reinforced
by the workings of instrumental rationality itself. The freedom to substitute one means
for another in service of profit, in particular, to substitute natural gas for coal as an
industrial fuel, would break the necessary connection between smoke and industry in the
city. Only in the wake of this material transformation, occurring in conjunction with
important cultural changes, would a largescale reevaluation of Pittsburgh’s
environmental standards take place.

Notes


7. At the time much of this land was disputed by the states of Pennsylvania and Virginia. It now lies for the most part in West Virginia. Centennial Anniversary of the Founding of Monongehela City, Pa. (Monongahela City: C.W. Hazzard, 1895): 70.

8. Through Lake Ontario, by portage to Lake Erie (around Niagra Falls) into Lake Chautauqua (by Portage) and into Conewango Creek which joins the Allegheny River.


15. Population figures for the borough, and then city, of Pittsburgh for the period covered by this chapter are as follows.

<table>
<thead>
<tr>
<th>Year</th>
<th>1790 (est.)</th>
<th>1800</th>
<th>1810</th>
<th>1820</th>
<th>1830</th>
<th>1840</th>
<th>1850</th>
<th>1860</th>
<th>1870</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>400</td>
<td>1,565</td>
<td>4,768</td>
<td>7,248</td>
<td>12,568</td>
<td>21,115</td>
<td>46,610</td>
<td>49,217</td>
<td>86,076</td>
</tr>
</tbody>
</table>

[Cushing et al.], History of Allegheny County, 621.


19. For further discussion of the rhetoric of wonder at the New World see Greenblatt, Marvelous Possessions.

20. Chapman, Old Pittsburgh Days, 8-10.


28. O. Ormsby Gregg, Pittsburgh, her advantageous position and great resources, as a manufacturing and commercial city: embraced in a notice of sale of real estate (Pittsburgh: Johnston and Stockton, 1845): 35-6.


37. Zadok Cramer, *The Navigator: Containing Directions for Navigating the Ohio and Mississippi Rivers with an ample account of these much admired waters, from the head of the former, to the mouth of the latter...* (Pittsburgh: Cramer and Spear, 1824) 12th edition, 35.

38. Zadok Cramer, *The Navigator: Containing Directions for Navigating the Ohio and Mississippi Rivers with an ample account of these much admired waters, from the head of the former, to the mouth of the latter...* (Pittsburgh: Cramer and Spear, 1824) 12th edition, 36-7.


58. Thomas, *Travels*, 16


76. Z. A. Thralls, “Pittsburgh, the City of Steel,” Home Geographic Monthly 1, March 1932, 25-30.
77. Baldwin, Pittsburgh, 149-50.
78. Baldwin, Pittsburgh, 221-2.
80. Gregg, Pittsburgh, 23.
81. Gregg, Pittsburgh, 16.
82. Gregg, Pittsburgh, 24.
83. Gregg, Pittsburgh, 25.
84. Gregg, Pittsburgh, 15-16.
85. Gregg, Pittsburgh, 16.
86. Gregg, Pittsburgh, 25.
87. Gregg, Pittsburgh, 34.
88. Gregg, Pittsburgh, 16.
89. Gregg, Pittsburgh, 29.


102. Thomas, Travels, 16.


109. As well as with smaller local population centers located more advantageously with respect to overland eastern trade.

110. Wade, The Urban Frontier, 314.


114. The Pittsburgh Gazette and Manufacturing Advertiser, November 7, 1823.

115. The Pittsburgh Gazette and Manufacturing Advertiser, November 7, 1823.

116. The Pittsburgh Gazette and Manufacturing Advertiser, November 7, 1823.

117. The Pittsburgh Gazette and Manufacturing Advertiser, November 7, 1823.


119. Baldwin, Pittsburgh, 221.


122. Gregg, Pittsburgh, 16.


132. The first series of the Index-Catalog of the Surgeon General’s Library lists a number of articles published before 1870 relating smoke and health, including parliamentary publications in 1819, 1820 and 1843 and publications by Britain’s General Board of Health in 1854 and 1855. It also lists articles from France and from Scandinavian countries from the 1850s and 1860s. In some cases article titles relate smoke and health directly. In those cases in which health is not explicitly mentioned, their inclusion in the Index-Catalogue indicates that, at least by 1892, when the relevant volume of the series was published, the editors viewed the issues raised as relevant to health. Library of the Surgeon-General’s Office (U.S.), *Index-Catalogue of the Library of the Surgeon-General’s Office, United States Army* (Washington: G.P.O., 1880-1932). (Series 1, volumes 1-16; Series 2, volumes 1-21; Series 3, volumes 1-10.)

133. Index-Catalogue of Surgeon-General’s Library Series 1 (1880-1897): 226-7 shows the following English-language entries for “Smoke” before 1870: B. Franklin, *Observations on the causes and cure of smoky chimneys. In a letter to Dr. Ingen-Housz, physician to the emperor at Vienna.*, (Philadelphia and London: 1787); W. Frend *Is it impossible to clear the atmosphere of London in a very considerable degree, from the smoke and deleterious vapour with which it is hourly impregnated?* (London:1819); Great Britain, General Board of Health, *Consumptions of smoke. Copy of a letter addressed to her majesty’s secretary of state for the home department by the General Board of Health, dated July 20, 1854; with a digest of the information obtained with regard to the operation of inventions for the consumption of smoke.* , (London: 1855); Great Britain, Parliament, House of Commons, *Report from the select committee on steam engines and furnaces etc.* , (London: 1819); Great Britain, Parliament, House of Commons, *Report from the select committee on steam engines and furnaces etc.* , (London: 1820); Great Britain, Parliament, House of Commons, *Report from the select committee on smoke prevention; together with the minutes of evidence, appendix and index.* , (London: 1843); F. C. Calvert, “The Smoke Nuisance: On the composition of the smoke from factories, compared with that from dwelling houses; and on their respective action upon vegetation and health,” *Transactions of the National Association for the Promotion of Social Science*, 1866 , (London: 1867) 440-2, discussion 570-3; R. A. Smith, “How far are smoke and the products of combustion arising from various manufacturing processes injurious to health? What measures ought to be taken to prevent the contamination of the atmosphere from such causes?” *Transactions of the National Association for the Promotion of Social Science*, 1866, (London: 1867) 429-440, discussion 570-3. Franklin’s letter is the only American entry.
134. E. Davy, “Experiments and observations upon the State of the Air in the Fever Hospitals of Cork, at a Time when they were crowded with Patients, labouring under Febrile Contagion,” *London Medical and Physical Journal* (40)1818, 274-7.


141. Parton connects Pittsburg’s Presbyterianism with its disdain for domestic luxuries and comforts: “The masters of Pittsburg are mostly of the Scotch-Irish race, Presbyterians, keen and steady in the prosecution of their affairs, indifferent to pleasure, singularly devoid of the usual vanities and ostentations, proud to possess a solid and spacious factory, and to live in an insignificant house. There are no men of leisure in the town.” (Parton, “Pittsburg.” 31.)
2.1 Smoke: “That Single Word”

In 1866 smoke was at issue in a nuisance suit against a brickmaker on a bucolic bluff overlooking the City of Allegheny (to be annexed to Pittsburgh in 1907). The Allegheny County Court of Common Pleas had issued an injunction against the brick maker, John Huckenstine, forbidding him to burn bituminous coal since it injured the orchards, crops, health and comfort of his neighbor. Huckenstine appealed to the state Supreme Court. The coverage in the local press derided the plaintiff with subtle sarcasm that contrasted his enjoyment of luxury with the defendant’s engagement in industry:

The hill has otherwise been improved by a number of gentlemen who have erected for themselves comfortable and costly houses and beautified their surroundings with all that money and taste and the skill of the landscape gardener could secure. But the brickyard in question is the incubus which rests upon and destroys all this rural paradise, by reason of the smoke which emanates in thick black clouds from the furnace fires.... The wealthy property owners in the vicinity, groaned in spirit over this affliction for some time, but at last brought the matter to the attention of a sympathizing jury of their fellow countrymen who agreed that the brickyard, or rather the smoke therefrom, was a nuisance and would have to be abated.

The columnist types the plaintiffs as “wealthy property owners” living in a “rural paradise” with their “comfortable and costly houses” and grounds “beautified” by “money taste and the skill of the landscape gardener.” They are aristocratic country
gentlemen whose complaints could be taken seriously only by a jury of “their fellow
countrymen.” The columnist goes further, with his feigned slip of the pen, to equate
abatement of smoke with abatement of the brickyard, that is, of industry, itself.

The Pennsylvania Supreme Court would apparently share many of the Pittsburg
Gazette’s assumptions about industry, comfort and virtue. In 1871, it overturned the 1866
injunction.³ Justice J. Agnew saw Pittsburgh’s entire civic identity as subsumed by
smoke:

The properties of the plaintiff and defendant lie adjoining each other, on the
hillside, overlooking the city, whose every-day cloud of smoke from thousands of
chimneys and stacks hangs like a pall over it, obscuring it from sight. This single
word describes the characteristics of this city, its kind of fuel, its business, the
habits of its people and the industries which give it prosperity and wealth. The
people who live in such a city or within its sphere of influence do so of choice
and they voluntarily subject themselves to its peculiarities and its discomforts, for
the greater benefit they think they derive from their residence or their business
there.⁴

Justice Agnew urged that any decision must “consider the customs of the people,
the characteristics of their business, the common uses of property and the peculiar
circumstances of the place.” He claimed that

...the heat, smoke and vapor of a brick-kiln cannot compare with those of many
manufactories carried on in the very heart of such busy cities as Pittsburg and
Allegheny. A court exercising the power of a chancellor whose arm may fall with
crushing force upon the every-day business of men, destroy[s]... lawful means of
support, and divert[s]... property from legitimate uses.⁵

Agnew’s emphasis on “means of support” highlighted the necessity of Huckenstine’s
making a living, to be weighed against the plaintiffs’ home comforts and rural pleasures.
Agnew pointed out that smoke emissions could be judged as nuisances only in the
context of the quality of the rest of the local environment. This sentiment had already
been popularly expressed by the Gazette, in the article cited above, when it characterized
Huckenstine’s appeal as a case in which “…if the ‘smoke nuisance’ is once established in Pittsburgh – if the Supreme Court decides the people can be smoked out even in Pittsburgh – then may interesting complications can be looked for in the future.” Agnew assumed the existence of community benefits from the operation of any business or trade and asserted that these community benefits carried with them certain community obligations including the obligation to endure discomfort and injury that might arise as a necessary consequence of the conduct of business.

The judicial opinion in Huckenstine’s Appeal concluded that no smoke nuisance could exist in the cities of Pittsburgh or Allegheny or in nearby neighborhoods since “smoke,” “that single word” summed up the entire identity of those cities. Yet, in 1892, at the end of an eight year period in which widespread use of natural gas had temporarily decreased smoke levels, many Pittsburghers, from elite women to steel and iron workers, would complain vigorously as the city returned to heavier use of bituminous coal and heavier smoke. How did Pittsburgh go from the city whose identity was captured in “that single word” to the city that decried “going back to the smoke”?

The answer lies in the city’s experience of a number of jarring local transformations, material, economic and ideological, related to and reinforced by larger cultural changes in American society. In the second half of the nineteenth century railroads superseded rivers, steel overtook iron, and petroleum and natural gas suddenly stood alongside coal as Pittsburgh’s chief mineral advantages. Even Pittsburgh’s characteristic atmosphere would be briefly de-natured by technology in the latter part of the period as clean natural gas temporarily replaced smoky bituminous coal as the major fuel for the city between 1884 and 1892. Equally jarring social and cultural changes
would accompany these technological and industrial ones. These would include the reorganization of the social geography of the city and realignments among categories of work and leisure, health and comfort, consumption and production and virtue and vice. Changes in Pittsburgh’s economic base were intertwined with these cultural transformations in remaking civic identity.

In this chapter I will examine the inter-related social, cultural, technological and industrial changes that both expressed and helped to bring about a re-orientation in environmental values. The significance of this reorientation touches the deepest elements of Pittsburgh’s culture and their relation to changing national cultural trends.

2.2 City of Smoke

Pittsburgh and Pittsburgh’s smoke symbolized the promise of post-bellum industrial growth to the reunified nation. In 1869 Scientific American described the American iron industry, of which Pittsburgh was the most important locus, as “more conspicuous than any other to which our country owes its greatness...the industry par excellence of North America.” The article – entitled “American Iron and Steel – Pittsburgh the Iron City” – gave over half of its first page to a large smoky picture of Jones and Laughlin’s new Pittsburgh iron mills and made much of the city’s smoke: “The smoke is so thick that you cannot walk through it...a forest of chimneys which by day and by night vomit forth lurid flames and smoke so dense that the air is filled with black snowflakes.”6 The previous September (1868) the New York Times had noted in Pittsburgh “a pall of murky smoke which floats over and through everything, leaving its dingy traces wherever it alights, and making a sombre twilight of what were otherwise midday.” This article paired energetic
and successful industry with copious smoke: “Of all cities Pittsburgh and her twin sister, Allegheny stand unsurpassed and even unequaled in the special points to which they devote their energies.” Pittsburgh was “…like the land of Goshen amid the plagues of Egypt” immune from post-war financial reversals, a “…busy, thrifty, smoky place.”

Harper’s New Monthly Magazine in 1880 called Pittsburgh the “City of Smoke” containing within it the “concentrated the energy of a commonwealth.” Pittsburgh’s metals industries, advertised by their smoke, stood for the Iron Age itself: “…it is as the City of Iron that Pittsburgh must go down into remotest futurity. She is the Smoky City only because of her forest of chimneys, whose tongues of flame speak of fires within that are boiling or melting the metal that gives the name to the age in which we live.”

In 1868 James Parton had written for Atlantic Monthly what soon became the paradigmatic description of Pittsburgh’s smoke:

Smoke, smoke, everywhere smoke! Smoke with the noise of the steam hammer, and the spouting flame of tall chimneys… On the evening of this dark day we were conducted to the edge of the abyss, and looked over the iron railing upon the most striking spectacle we ever beheld. The entire space lying between the hills was filled with the blackest smoke, from out of which the hidden chimneys sent forth tongues of flame, while from the depths of the abyss came up the noise of hundreds of steam hammers…soon the wind would force the smoky curtains aside and the whole black expanse would be dimly lighted with dull wreaths of fire….if any one would enjoy a spectacle as striking as Niagara, he may do so by simply walking up a long hill to Cliff Street in Pittsburgh and looking over into – hell with the lid taken off.

Parton described smoke luridly, with an abundance of satanic imagery. Parton’s Pittsburgh, like the underworld itself, lay in a “deep chasm,” “as at the bottom of an excavation” and “every object in it [was] black.” Journalist Ralph Keeler (teamed with illustrator Harry Fenn), working for Every Saturday in 1871, referred to James Parton’s “Pittsburg” as if the article were well known, parroting some of its characterizations of
the city in his own piece. Pittsburgh had become Parton’s hell: “Since Mr. Parton spoke of a certain part of Pittsburgh by night as ‘Hell with the lid taken off,’ the phrase has become proverbial in that city.”

Other national writers took up underworld themes, some of them making explicit or implicit references to Parton’s “Hell.” Keeler and Fenn, for instance, shared with Parton the image of monsters with fiery eyes looking out at the approaching visitor from dark hills. An 1880 Harper’s article claimed that Dante’s Inferno prefigured a crucible steel-making scene. When Willard Glazier wrote about Pittsburgh in his Peculiarities of American Cities in 1883, he began with infernal imagery borrowed from Parton; he called the city a “gloomy amphitheatre” and “the great furnace of Pandemonium with all the lids lifted.” Yet Glazier explicitly rejected the identification of Pittsburgh with the underworld: “This is the domain of Vulcan not of Pluto.” Vulcan works and then “stretches himself beside his forge, and sleeps the peaceful sleep which is the reward of honest industry.”

While Pittsburgh could be demonically picturesque by night, by day it was dismal. For Parton a Pittsburgh dawn was as “as dark as midnight.” The city kept its gaslights on in the daytime and on some days would only see the sun for half an hour around 2pm. For Glazier on “a dismal day in autumn, when the air [was] heavy with moisture and the very atmosphere [looked] dark” “all the romance [had] disappeared.” On such a day “then [was] Pittsburgh herself” “a smoky dismal city at her best...at her worst, nothing darker, dingier or more dispiriting [could] be imagined.” Keeler and Fenn combined the dramatic and the dismal describing a view both created and obscured by smoke:
...smoke from a thousand chimneys rose gradually higher...half of a picturesque bridge reaching from blackness to blackness, spanning a chasm in the lower cloud....the long throats of chimneys...black with their many years of suicidal strangling, were about all that was now left to us of our General View of Pittsburgh; and we descended again into the noise and coal-dust of the dingy city.17

As Keeler and Fenn’s comment about the use of Parton’s “proverbial” phrase in Pittsburgh itself makes clear, the views expressed in these national articles were not unconnected with the opinions of Pittsburghers about their own city. National articles were certainly read, discussed and written about locally. Pittsburgh writer and newspaper editor Charles McKnight in his 1873 historical novel Old Fort Duquesne or Captain Jack, the Scout combined descriptions of natural beauty with biblical and satanic imagery similar to Parton’s to describe the city:

Ranges of bold and picturesque hills jostle and overlap....mills and factories hugging the hill sides as if fighting for place to live and work; “pillars of smoke by day, and of fire by night,” from countless mills, forges, furnaces, ovens and foundries...[a] night scene from this point with the huge fires from mill, oven and furnace glaring against the sky is simply a glance into Pandemonium.18

McKnight continues by making explicit reference to Parton: “It is, as some writer more forcibly than elegantly expresses it, ‘hell with the lid off.’”19

The relation between national and local writers was bidirectional. They referred to one another both in their descriptions of smoke and in their discussions of other aspects of life in Pittsburgh. Pittsburghers were not unaware of either the intensity or the causes of their city’s legendary smokiness and often illustrated the magnitude of Pittsburgh’s industrial operations with reference to the magnitude of their smoke.20 Local writers could provide statistics to visiting journalists. Both Keeler and Fenn in 1871 and Willard Glazier in 1883, for example, quoted a Pittsburg Board of Trade circular that claimed that
1/5 of all coal used in the city went up in smoke. Keeler and Fenn remarked “The subtle and impish power of several thousand bushels of coal in the air at one and the same time may be imagined.” Writers also consulted several other standard sources from which they drew statistics, descriptions and cultural characterizations of the city. In particular, they relied on Pittsburgh businessman George Thurston’s four promotional histories of the City of Pittsburgh and of Allegheny County, from 1857, 1876, 1886 and 1888 and on journalist David Lowry’s 1870 statistical overview of the city’s economy, Pittsburgh: Its Commerce and Industry. Keeler and Fenn relied on both authors and claimed it had been absolutely necessary to talk to Thurston – “without whose aid no one can now write intelligently of Pittsburgh.” National writers frequently cited Thurston’s statistics and echoed many of his characterizations of the city. Both Keeler and Fenn in 1871 and Willard Glazier writing twelve years later referred to Thurston’s boast of the city’s “thirty-five miles of factories in daily operation twisted up into a compact tangle; all belching forth smoke; all gloomy with fire; all swarming with workmen; all echoing with the clank of machinery.” Frank Leslie’s Popular Monthly in 1888 also used Thurston’s estimate of 35 miles of factories without referring to him by name.

Colorful local descriptions of Pittsburgh’s industry and smoke often characterized the city as Olympian workshop rather than as the land of the dead. Pittsburgh itself as giant or divine smith was a common motif. Thurston in 1886 described his city as “Standing a giant athwart at the head of the Ohio – glowing with the blaze of hundreds of furnace fires, swart and grimy with their smoke....” Journalist, lecturer and sometime Pittsburgher, Richard Realf, captured common images of the city in his “Hymn of Pittsburgh.”
My father was mighty Vulcan
I am Smith of the land and sea,
The cunning spirit of Tubal Cain
Came with my marrow to me;
I think great thoughts strong-winged with steel,
I coin vast iron acts.
And weld the impalpable dream of Seers,
Into utile lyric facts.

I am monarch of all the forges,
I have solved the riddle of fire,
The Amen of Nature to need of Man
Echoes at my desire;
I search with the subtle soul of flame,
The heart of the Rocky earth,
And out of my anvils the prophecies
Of the miracle years blaze forth.

I am swarth with the soot of my chimneys,
I drip with the sweats of toil,
I quell and scepter the savage wastes
And charm the curse from the soil;
I fling the bridges across the gulfs,
That hold us from the To Be;
And build the roads for the bannered march
Of Crowned humanity.

The poem attributes to Pittsburgh the boldness and manly strength characteristic of both
the divine smith and the frontiersman. Through technology both work and nature are
redeemed and Eden recaptured – the curse charmed from the soil and the savage wastes
quelled. All this is accomplished by Pittsburgh “swarth with ...soot” and dripping with
the sweat of valorous republican toil. The character of the blacksmith had long been
associated with republican ideals of manhood: industry and independence. Longfellow’s
“Village Blacksmith” with his “large and sinewy hands” and “brow wet with honest
sweat” exemplifies such ideals. He works “week in week out from morn til night” and
“looks the whole world in the face, for he owes not any man.” Longfellow’s smith, like
Pittsburgh personified, above, is a model for industrious engagement in shaping the world: “Each morning he sees some task begin, / Each evening sees it close....Thus at the flaming forge of life, / Our fortunes must be wrought.”

Realf’s poem was used in the city’s 1876 Fourth of July celebrations and was reprinted at least eight times in promotional pamphlets and histories of the city between 1873 and 1924. It was also printed in Pittsburgh’s foremost labor paper the National Labor Tribune in February 1878 as well as in the first issue of Charities and Commons devoted to the Pittsburgh Survey and as an epigram to the Pittsburgh District Civic Frontage volume of the Pittsburgh Survey itself. The “Hymn of Pittsburgh” represented the essence of the city for both Pittsburghers and national observers for the better part of five decades. Pittsburgh’s most important early union, organized by the iron puddlers in the late 1850s, was called the Sons of Vulcan. The blacksmith, seen as the embodiment of republican manhood, was strongly associated with the fire and smoke of his forge.

2.3 Jarring Transformations: Rivers to Railroads, Commerce to Industry, Iron to Steel

Pittsburgh was an industrial spectacle of titanic proportions in the second half of the nineteenth century. Manufacturing in the city and region grew tremendously during and after the Civil War. This was not only expansion but transformation of one economic orientation into another. The maturation of the country’s railroad network had undermined the importance of water transportation and the key role that Pittsburgh had played in it, situated at the headwaters of the Ohio. The Baltimore and Ohio Railroad came to Pittsburgh itself in 1852. As early as 1857 George Thurston had shown concern for the threat of the railroad to Pittsburgh’s “mercantile interests.”
The advent of the rail and the locomotive caused a revolution in that portion of our trade [from the West and Southwest], and much of it was drawn, by the facilities of reaching the East, to the Atlantic cities. Unpleasant as the fact is... the close connection in which the railroads placed Pittsburgh with New York and Philadelphia, materially injured her wholesale business.\textsuperscript{32}

As a result of this threat, merchants who had made their fortunes in the packet business, shipping goods by river to the West, shifted their capital from buying and selling to manufacturing – particularly to the manufacturing of railroad iron.

Pittsburgh’s economy did not simply shift to manufacturing, however, its manufacturing power exploded. According to Paul Krause, by the early 1870s Pittsburgh had the strongest economy of any metropolitan region in the United States.\textsuperscript{33} The city had increased its manufacturing workforce of from 17,500 in 1860 to more than 34,000 in 1870, with an increase in the metalworking workforce alone from 4,800 workers in 1860 to 13,500 workers in 1870. In the 1860s capital investment in metals had increased by more than 300%. The value of metal production had increased by more than 500%. In 1856 Pittsburgh had supported 25 rolling mills and produced 140 thousand tons of iron with 4600 workers and made $10.7 million worth of product. In 1870 the metropolitan area supported 33 rolling mills employing 7100 workers, producing $20 million in product. In addition, by 1870 the metropolitan area also was home to 6 cast steel plants producing 3.5 million dollars in product and employing 1000 workers.\textsuperscript{34} These phenomenal increases in industrial production, with their concomitant increases in population and coal consumption, led to equally phenomenal increases in smoke.\textsuperscript{35}

Industrial change in Pittsburgh took the form of dramatic growth in the iron industry and in the movement of the largest manufacturers from iron to steel. The shift of capital from river commerce to manufacturing gave birth to the Jones American Iron
Works, featured in the 1869 *Scientific American* article discussed above as representative of the promise of post-bellum American industry. During the 1870s Andrew Carnegie introduced the Bessemer process for making steel in large batches in his Edgar Thompson plant in Braddock. Carnegie soon took over the Pittsburgh Bessemer Steel Works in Homestead and began to build mills along the Monongahela River in Duquesne and McKeesport – establishing what would remain as the core sites of Pittsburgh steelmaking for slightly over a century. America’s steel industry was born in Pittsburgh during these years.\(^3^6\) The movement from iron to steel would be significant to the further history of smoke and smoke regulation in Pittsburgh. While the shift to steel would increase Pittsburgh’s industrial capacity and coal consumption dramatically, coal consumption per ton of metal produced would decline. According to Kenneth Warren, in 1879, early in the transition to steel, 2 tons of “coal equivalent” were required to produce a ton of pig iron. By 1889 the ratio of fuel to pig iron produced was 1:85 and in 1889 the ratio remained at the still relatively low 1:72.\(^3^7\)

The movement from iron to steel was largely a response to a problem of labor costs. In the mid-nineteenth century the American iron industry had self-consciously lagged behind the iron industry in Britain. American ironmasters, following Adam Smith and Charles Babbage, sought to increase specialization and division of labor and reduce reliance on skilled workers in order to improve their competitiveness by increasing production and lowering costs. They faced an irreducible bottleneck in iron production however, as the standard way to make malleable iron was for a highly skilled puddler to reheat cast or pig iron in a puddling furnace until it had just the right characteristics. The
process of puddling required a high degree of skill and judgement and had been impossible to subdivide or mechanize.\textsuperscript{38}

In 1856, Henry Bessemer developed a process of making a malleable form of iron, which he would later assimilate to steel (though the metal was not identical to what had to that point been called “steel”), in a way that bypassed the puddling process. The Bessemer process was not very successful in England since it required non-phosphoric ore, which was difficult to obtain there. By the 1860s, however, American ironmasters became particularly interested in the Bessemer process because of their access to non-phosphoric ore from the Great Lakes region. This advantage eventually allowed American ironmasters to bypass their labor-cost bottleneck. The largest and most aggressive among them pursued this goal by deploying both technology and union-busting techniques against puddlers at the very time the American labor movement entered the period of some of its fiercest struggles.\textsuperscript{39}

The labor movement in Pittsburgh grew stronger between the 1850s and 1870s despite the looming threat of Bessemer steel. After the Civil War, labor made forays into electoral politics. Labor’s candidate narrowly won the 1865 Pittsburgh mayoral race, but further electoral efforts repeatedly fell short of this mark through the rest of the 1860s and 1870s. Nonetheless, Pittsburgh craft unions emerged as important forces in these years. The 1873-9 depression radicalized labor and heightened interest in amalgamation.\textsuperscript{40} Labor strife in the city peaked in the 1877 Great Railroad Strike, supported by many in the community as a multi-class uprising against the domination of “monopoly”.\textsuperscript{41} For many of Pittsburgh’s industrial and business leaders, however, the 1877 strike required swift and sure reaction. Even before the strike, in 1874, labor’s
limited electoral successes had prompted the formation of the Pittsburgh Chamber of Commerce as an instrument of “law and order” and as a force to oppose labor’s political power. Elite fears in the aftermath of the Great Strike led to more intensive efforts. Industrialists worked with the Pennsylvania legislature to strengthen the state militia for use against strikers and rioters. Nonetheless, employers’ mobilization against labor after 1877 only augmented the cost-cutting war in which they were already engaged against the wage demands and shop-floor power of skilled workers.42

As part of an active employer program to cut costs and reduce labor’s power, the shift to steel brought de-skilling, the 12-hour day and the destruction of unions. During the 1873-79 depression, which had lent strength to the labor movement, Andrew Carnegie had taken advantage of low prices to invest in iron making infrastructure. As noted above, his Edgar Thompson Works was completed in Braddock in 1875 and would be the region’s first Bessemer steel facility. The growth of the steel industry in Pittsburgh resulted in a proletarianization of the workforce.

2.4 Pittsburgh as Craftsmen’s Empire: Labor Struggles and Republican Ideals

In the period immediately before the transition to steel, the organization of labor in industries like iron and glass had been far from proletarian. David Montgomery in Fall of the House of Labor takes Pittsburgh’s post-bellum iron industry as the paradigmatic case of the craftsmen’s empire43 dominated by an “aristocracy of labor.” Skilled iron workers in Pittsburgh were essentially sub-contractors as late as the 1870s. They contracted with their employers for payment by the ton of metal produced. Iron puddlers, rollers, heaters and nailers possessed specialized knowledge on which production processes depended.
They set their own hours and split their wages with a number of subordinate workmen whom they chose and supervised. Montgomery traces both employers’ efforts through the long national deflationary period of 1873-1897 to raise output and eliminate workers, largely through the introduction of new technologies. He also chronicles workers’ efforts to maintain autonomy, control of work processes and a decent standard of living in the face of employer encroachments. Much of the story he tells focuses on Pittsburgh.

At the end of the Civil War Pittsburgh workers faced inflation of prices while employers faced a shortage of labor. This combination created an inviting climate for assertion of labor demands. The iron puddlers’ union The Sons of Vulcan conducted a successful strike in 1867 that “established their union...[as an] enduring institution....” Pressmen and glassblowers also conducted major and successful strikes in that year. Craftsmen who had enjoyed autonomy and exercised control in practice now sought to codify them in union work rules. Craftsmen believed that such rules, for instance limiting the number of heats (furnace charges) that workers should produce in a day, protected workers’ dignity by expressing devotion to “unselfish brotherhood” and preserving opportunities for the “cultivation of mind.” Employers used Bessemer steel to destroy Pittsburgh’s Craftsmen’s Empire by bypassing the puddling process.

Increased division of labor and mechanization of production in the steel industry and a new marriage between glass production and natural gas would subject Pittsburgh’s skilled laborers to unwelcome changes in their work-processes, to reduced autonomy and diminished valuation of their skills. In addition, these mostly native born or northern European skilled workers faced new competition for the unskilled and semi-skilled jobs, recently created by the new steel industry, from newly arrived immigrants. In the years
following the 1877 riots Pittsburgh industrialists hammered away at union power. These efforts would culminate in H.C. Frick’s victory over the Amalgamated Association of Iron, Steel and Tin Workers in the strike at Carnegie’s Homestead Works in 1892. Through employment of new technologies and new efforts to control and dominate labor, industrialists built and strengthened Pittsburgh’s particularly intense form of heavy industrial capitalism between the Civil War and mid-1880s.

2.5 New Technology and Republican Ideology

As workers faced industrial expansion fueled by technological change they also were immersed in a period of ideological ferment about the meaning of work and freedom brought to a head in the Civil War. Francis Couvares argues that republican ideology was a basis both of cross class unity and of working-class solidarity and cultural dominance in Pittsburgh of the 1860s and 1870s. Paul Krause argues that Pittsburghers’ response to employer attacks, such as those described above, was to take up a campaign to end wage slavery and dependence by promoting a republican alternative to industrial capitalism. He explains the 1892 Homestead Strike as a last ditch effort to preserve the prerogatives of workers’ republican culture.

Krause defines republicanism, which he traces back to classical sources, as an ideology centered on preservation of the common good through participation in public life. Pursuit of such a goal required a virtuous citizenry and citizen virtue required “independence from the control of others.” Krause integrated the ideas of inalienable natural rights and equality before a system of representative government, which had been prominent in the rhetoric of the American Revolution, with these classical ideals.
Kasson, in his work on technology and republicanism, contends that American republicanism was concerned with maintaining a balance between “power, liberty and virtue.” To keep power from “menacing its natural prey, liberty” both the government and the citizenry were to conduct themselves with the “strictest rectitude.” Republican virtue, the sort that would allow the individual to subordinate his needs to those of the commonwealth, depended on several of the virtues already valorized in Puritan religion. Kasson lists republican virtues as “social service, industry, frugality and restraint” and opposes them to vices of “selfishness, idleness, luxury and licentiousness.”

Characterizations of Pittsburgh and Pittsburgh workers already discussed above, the rhetoric surrounding Huckenstine’s appeal, and discussions of work and workers in Glazier, Realf and Longfellow rely on such republican virtue and vice oppositions. Such characterizations figure prominently in many other sources to be discussed below.

The opposition of luxury and industry was particularly important to thinking about the political significance of various forms of work and technology. The non-importation movement during the Revolutionary War particularly linked home production and the avoidance of European luxuries with the preservation of the possibility of the establishment of an American republic. After the Revolution conflicts over the relation of production and consumption to republican virtue became more complex. On the one hand, the promotion of American manufacturing could free the new nation and its citizens from dependence on foreign goods. On the other, the employment of American workers in factories could imperil republican virtue. Such employment would undermine republican independence since factory workers would rely on their employers for wages rather than on their own industry and their own land. Class
divisions between employers and factory operatives threatened republican ideals of
equality and natural rights. In addition, American factories, while circumventing
dependence on imported luxuries, could create a taste for luxuries produced at home.
This might either undermine republican frugality or promote republican equality
depending on the view one took. This conflict over the relationship of industrial
technology and republican virtue was most famously enacted in disputes between
Thomas Jefferson and Alexander Hamilton that have become known as the “Debate Over
Manufactures.” Jefferson associated republican independence only with agrarianism yet
Jefferson’s own later industrial experiments demonstrate that his fear of urbanization was
more persistent than his suspicion of industry. The industrial experiment at Lowell,
Massachusetts and its exhibition to a ceaseless parade of European visitors was a living
argument that American republicanism, without urbanization at least, could be
maintained even with the development of American manufactures. Debates over the
relationship between luxury, industry, dependence, equality and republican virtue
persisted in the popular press – from argument over early national internal improvements
to tariff conflicts and labor disputes of the mid-nineteenth century.

Property, accumulation, luxury and necessity were important and shifting
categories in these debates. Both reformist activists within the labor movement and
critics of labor unrest focused, though from different angles, on the preservation of such
republican virtue. Those who defended capitalism, such as Andrew Carnegie, also
appealed to republican traditions to legitimize “the sanctity of property and the virtue of
accumulation.” Yet, republican labor reformers in Pittsburgh’s National Labor Tribune
appealed to ideas of “natural justice,” condemning unlimited accumulation of wealth
when it denied workers a competence, “a certain degree of comfort and measure of happiness which they should enjoy regardless of the empirical and cruel law of supply and demand.” Republican workers saw their labor as having an intrinsic value equal to that which would offer them a decent material standard of living. This was the right to “a competence.” A competence usually included owning a small house and property rights were important in insuring “a life of dignity.” The idea of a competence distinguished property for use and property for accumulation. Workers also regarded labor as the property of the laborer: “to deprive a worker of his work was to deprive him of both the right to property and his right to a competence.” By the 1880s labor republicanism in Pittsburgh was declining due to internal fragmentation in the labor movement and employer successes at using both technology and force to defeat worker initiatives. Republican radicalism and solidarity lasted longer in Homestead, the town that grew up around Carnegie’s Homestead steel works, only to be defeated in the famous Homestead Strike of 1892.

2.6 Demise of the Walking City: Fragmentation of the Urban Republic

Pittsburgh’s republican culture, while it lasted, was supported by the integration of multi-class residential, industrial and commercial life embodied in the mid-nineteenth century walking city. The weakening of this multi-class republican community was hastened by geographical movement in response to environmental degradation. In 1850 Pittsburgh had been a walking city, in which rich and poor, residential and industrial properties were intermixed. Its cultural identity was shaped by a dominant working class culture whose representative citizens were artisanally skilled iron and glass workers. A less assertive
provincial elite culture, whose expressiveness and power was inhibited by religious strictures against the enjoyment of leisure, influenced the city to a lesser degree. The first streetcars began running in 1859, and by 1860 a few inclines began to provide transportation up and down Pittsburgh’s hills. Elite citizens began to move their residences east to the new, nearly rural, suburbs – some officially within, and some without, the city limits. After the Civil War and especially after 1880, both industry and residence began to spread out from the mixed class and mixed use neighborhoods of the old walking city.

The growth of the iron industry and the replacement of iron by steel fomented other changes in class relations. These both contributed to and were sustained by changing environmental conditions and attitudes. Dramatic industrial growth led to dramatic population growth. Foreign immigration was a major contributor. In the 1860s alone the population of Pittsburgh increased by 80%. Increased population and especially the influx of immigrants, combined with intensification of industrial usage of urban space, disrupted existing residential patterns. Newer annexed areas grew more quickly than the Old City. Such movement can be interpreted both as expected urban growth and as escape from the most heavily industrialized parts of the urban environment.

Smoke, noise and the other unpleasant concomitants of intensifying industrialization spurred suburbanization directly. Thurston linked smoke and suburbanization as early as 1857. He claimed that smoke alone prevented Pittsburgh from being the most desirable residential location in the United States, yet he went on to excuse the city’s smoke by pointing out the ease of suburban escape:
...the nature of the site upon which Pittsburgh is built is such that a walk of fifteen minutes from the business centre of the city, will bring the pedestrian out upon high table ground, from two to three hundred feet above the level of the city, and clear of its smoke affording the most picturesque sites for residences that could be wished – and of which large numbers of our inhabitants have already availed themselves.  

Thurston concluded his entire 1857 survey of the city with a defense of smoke through the recommendation of suburban escape:

Much is said of our smoke and consequent disagreeableness, yet it should be remembered there is not a city without some drawback and when the smoke complained of results in wealth, progress and health, it can easily be put up with, the more especially as a walk of from ten to fifteen minutes brings the pedestrian out on high grounds, beyond the smoke and its consequent annoyances.  

Keeler and Fenn, writing in 1871, spoke of both recreational and residential escape from smoke: “notwithstanding...the local pride and love of the richer citizens, as many of them as can get away do manage to forego the heat and coal-dust of the midsummer.”  

Allegheny City, on the plain north of the Allegheny River served as one refuge from smoke. Keeler and Fenn described it as the “social centre” of Pittsburgh and as “in some measure protected from the smoke of her weird sister” since it was “the point from which the prevailing winds bl[e]w.” Residents who “ma[d]e the atmosphere of one city disagreeable [went] over into the other to live.” Allegheny City had even established a hundred acre park on valuable land – evidence of the “taste and culture which these prosperous people are somehow getting along with their wealth.” Yet, it was Allegheny City over which Huckenstine’s smoky brick kiln was allowed to remain perched in the very year Keeler and Fenn wrote. Pittsburgh’s industrial identity made residential escape a prospect whose benefits were far from assured.
Into the 1880s, however, Pittsburgh’s suburbanization was impeded by transportation difficulties to such an extent that much of the character of the walking city remained. Nonetheless, suburbanization appeared as the obvious answer to urban pollution for both local and national writers throughout the period. An 1880 Harper’s Monthly article discussed the “thriving suburbs” to which “the careworn Pittsburger flees when his daily duties end, glad to escape for the time the all-pervading soot and smoke” and an 1888 article from Frank Leslie’s Popular Monthly mentioned Pittsburgh’s fashionable suburbs of the East End. By the late 1880s more inclines and other forms of public transportation became available, allowing residential suburbanization to accelerate. During the 1880s and 1890s, however, industry would also suburbanize – in search of new land, better fuel access and escape from seats of urban labor power. Elites fled the city to escape smoke, yet smoke-making industry would not be confined within city limits. Some Pittsburghers fled further than the city’s new East End. Andrew Carnegie himself had escaped smoky and crowded Pittsburgh in the 1860s by moving to New York City. Carnegie worried that others would see his move as invalidating his status as a “workingman,” which he claimed on the basis of his view of Pittsburgh as an egalitarian republican commonwealth.

2.7 Smoke in James Parton’s Frontier Republic

As Pittsburgh itself faced technological, ideological and social transformations between the 1860s and the 1890s, its place in national consciousness also underwent significant change. Pittsburgh had long represented both the Western frontier and the foremost experiment in American industrialization to the nation as a whole. Changes in its cultural
identity would have national consequences. It is for this reason that Pittsburgh enjoyed significant and consistent attention from the national press. The coherence of national mythologies surrounding republicanism and the West were tested in the crucible of post-bellum Pittsburgh.

As we saw in the last chapter, Pittsburgh’s identity as a frontier place helped to establish it as a city ruled by an extractive instrumental rationality. Its status as frontier city made its existence seem precarious and constantly in need of economic justification. This status also gave rise to tensions between frontier laxity and urban constraint.69 Pittsburgh had been the “Gateway to the West” when the West lay just beyond the Appalachians and down the Ohio. After the Civil War, Pittsburgh sat, spatially, temporally and culturally, on a border. As the post-Bellum economy expanded into the larger and further West – with the rise of the cattle market in the late 1860s, the expansion of agriculture into the tall-grass prairie in the 1870s and into the drier short-grass prairie in the abnormally wet 1880s – Chicago, Cincinnati and St. Louis became the new Gateway cities. Processing of western products outstripped provisioning settlers as the primary function of Western cities. The Pittsburgh of the late 1860s looked backward toward its days as a western provisioner sending goods down the Ohio and forward to a future based more solidly on manufacture for its own sake – a future based not on flowing water but -- even more intensively than before -- on buried coal. Pittsburgh’s frontier identity, while never abandoned, was significantly transformed.

For national writers, Pittsburgh’s Western identity was a set piece, often used as a contrasting backdrop for discussions of its industrial development. An 1871 Harper’s article about Pittsburgh began with discussion of the French and Indian War as a struggle
for the possession of “the key of the Mississippi Valley” now the “Iron City.” An 1880 Harper’s article on Pittsburgh’s industry highlighted George Washington’s comments on the original site for the city. Willard Glazier described the Edgar Thompson Bessemer steel works built at the location of General Braddock’s 1755 defeat, contrasting this past with the future-directed orientation of Pittsburgh:

The Pennsylvania Railroad now crosses the location of the thickest of the fight, and at the time of its construction a considerable number of human bones were dug up and reinterred....The hillside, which was then pierced by bullets, is now perforated near its summit by large openings, through which emerge car-loads of coal. Thus the present and the past strike hands across the century, and modern civilization, with its implements of industry and its appliances of commerce, supersedes and obliterates the traces of savagery, and of the deadly enmity of man toward man.

In 1888 Frank Leslie’s Popular Monthly described the site of Pittsburgh as sacred ground because of its colonial war history, yet claimed that “there is probably no other place in the world where the imagination finds it more difficult to travel backward than at Pittsburgh.”

Pittsburgh’s continued right to claim Western status was locally and nationally subject to critical evaluation, or at least in need of analytical justification. Lippincott’s Magazine in 1879 suggested that “The West’ is becoming one of the vaguest and most illusory of expressions.” An article from DeBow’s Review and Industrial Resources from 1859, intended to show the dramatic difference between rates of population growth in the continental interior and on the eastern seaboard, remarked that the center of population of the entire country in 1854 had been “very near Pittsburgh” and that by
1860 it was expected to cross the Ohio River. The article asserted the distinction between the center of population and the center of trade, but nonetheless looked forward to the day when the center of trade would cross the Ohio as well.76

Locally, the anxiety about Pittsburgh’s Western status was acute by the late 1850s. Thurston’s 1857 survey of the city devoted an entire chapter to what he called the “progressional ratio,” a measure of the degree to which Pittsburgh’s population had “kept pace with the increase of that of the western country” and of “the ratio of increase of our manufactures by the same index.” By tracking the ratio of Pittsburgh’s population by decade to that of the West, Thurston argued that Pittsburgh grew in population as fast, and in fact faster, than the West as a whole. In addition, Thurston showed that the monetary value of Pittsburgh manufactures per Western resident had increased between 1810 and 1857 and that it had in fact increased by five to six times the amount required to keep pace with Western population.77 Thurston’s calculations were motivated both by an anxiety about Pittsburgh’s being surpassed by newer Western cities and by a conviction that Pittsburgh’s economic future hinged on the consumption of the Western market.78

As we have seen in the previous chapter, James Parton in 1868 addressed the tensions between Pittsburgh’s frontier history and its industrial present. Like other writers, Parton clearly identified Pittsburgh as Western.79 As he entered Pittsburgh, the geography of the rivers announced to him: “Here Begins the Great West.” Yet Pittsburgh was for Parton both where the West began and where it terminated.80 Although Pittsburgh’s status as Western gateway was fading into its own past, Parton associated the West with America’s future and Pittsburgh’s innovations as a manufacturing center with Western newness and energy.
Parton resolved tensions around Pittsburgh’s fading identity as a literal spatial frontier by making it into a figurative temporal frontier of industry. Yet he also illustrated direct affinities between frontier and intensively industrial cultures. For Parton, Pittsburgh was, in its essence, a rough, practical and manly town because of its Western and Scotch-Irish Presbyterian history. This manly strength allowed Pittsburghers to live in harmony with a natural environment dominated by smoke and industry. Industrial Pittsburgh remained a challenging wilderness because of its demanding and primitive environmental conditions. Pittsburgh continued to partake in the newness and promise of the West and in the relation of the frontier to the nation as a whole. Pittsburgh, remaining exotic and savage because of its smoke, could also serve, because of its advanced industry, as harbinger of future developments for the nation as a whole.

Parton’s article occupies a pivotal place in Pittsburgh’s cultural history. As already noted, Parton’s “Pittsburg” gave the city the “proverbial” phrase with which to describe its smoke. More than any other contemporary account it both captured and influenced late nineteenth century views about the city. The piece is one of fewer than half a dozen articles about Pittsburgh listed in Poole’s Index. Contemporaneous articles express elements of the ideology put forward by it and most of the limited number of immediately subsequent descriptions of the city make explicit or implicit reference to it. In addition, the article has been used by social historians to make points about Pittsburgh’s culture in the period. Parton’s “Pittsburg” portrays the city in terms of a pre-existent and widely accepted frontier and republican mythology. It also points to tensions induced in this mythology through confrontation with the jarring industrial and
social changes we have discussed. Parton accomplishes both his mythologizing and his deconstruction of mythology through his discussion of Pittsburgh’s smoke.

Many writers shared with Parton views of Pittsburgh’s character as proof that republican social relations and large scale industrialization could coexist. As noted above, debates over the possibility of such coexistence had been central to consideration of the prospects of an American republic since colonial times. National articles after the Civil War described some of the interlocking elements of Pittsburgh’s republican character. Many such elements were initially articulated in George Thurston’s surveys of the city, to which some of the articles explicitly refer. Parton’s piece provided the first link between Thurston’s characterizations of the city and the national reading public.

Widely held views of republican Pittsburgh in the second half of the nineteenth century began with George Thurston. In his 1857 promotional history Thurston celebrated the frugality, industry and prudence in business of Pittsburghers.

Frugality and industry are prominent characteristics of the inhabitants of Pittsburgh; consequently, a large amount of conservatism is observable in all their transactions. ...The reputation abroad of its merchants and manufacturers for solvency, is the result, not only of their industry and their wealth but of the conservative element in their business transactions....

In true republican fashion, he went on to connect industry, austerity and equality of classes:

The industry of its population is not surpassed by that of any other city, and there are, for all the wealth of its population, fewer gentlemen of leisure, than in any city of the Union....There are at the present time, but few if any families, in which the male members are not engaged in some occupation , from day to day – of either a professional, mercantile or mechanical character; and there could not be pointed out half a dozen men of wealth who, themselves, or their sons, lead the life of leisure which is usually led by persons equally wealthy, in other cities of the Union....The wealth of the city is generally distributed – as result of the frugality and industry before mentioned.
Thurston further associated such virtues and the condition of class equality with the primary republican virtue of independence and with the possession of a competence (though perhaps a competence amounted to more in dollars for Thurston than for an iron puddler).

In the wealth of her population Pittsburgh would probably compare unfavorably with the large eastern cities, as to the number of persons usually termed millionaires, implying the possession of $500,000 or over. Yet in point of fact persons who may be considered independent, and those possessing handsome fortunes and competencies, there is in all possibility no other city, for the same population, that can compare favorably with Pittsburgh. 84

Like Thurston, Parton took Pennsylvanians generally, and Pittsburghers in particular, as conservative and prudent inhabitants of a region with its own distinctive “square, plodding, careful, saving” nature. Scotch Irish Presbyterianism was at the root of local character.

The masters of Pittsburg are mostly of the Scotch-Irish race, Presbyterians, keen and steady in the prosecution of their affairs, indifferent to pleasure, singularly devoid of the usual vanities and ostentations, proud to possess a solid and spacious factory, and to live in an insignificant house. There are no men of leisure in this town....to this day it is said that a Pittsburg man of business who should publish a poem would find his “paper” doubted at the bank: “A good man, sir, but not practical.” 85

Glazier in 1883 also commented on Pittsburgh’s Scotch-Irish Presbyterian devotion to work:

For Pittsburg, settled by Irish-Scotch Presbyterians, is a great Sunday-keeping city. Save on this day her business men do not stop for rest or recreation, nor do they ‘retire’ from business. They die with the harness on and die, perhaps all the sooner for having worn it so continuously and so long. 86

Following both Thurston and Parton, Glazier too connected Pittsburghers’ universal industry with both austerity and class equality. The busy manufacturer “has no
time for leisure or social pleasures, and must even stint his hours of necessary rest."\textsuperscript{87}

Such virtues supported democracy – understood as equality of opportunity:

Pittsburg illustrates more clearly than any other city in America the outcome of democratic institutions. There are no classes here except the industrious classes; and no ranks in society save those which have been created by industry. The mammoth establishments, some of them perhaps in the hands of the grandsons of their founders, have grown from small beginnings, fostered in their growth by industry and thrift. The great proprietor of to-day, it may have been, was the “boss” of yesterday, and the journeyman of a few years ago, having ascended the ladder from the lowest round of apprenticeship.\textsuperscript{88}

An 1880 Harper’s article characterized Pittsburgh capitalists as former workers:

“All these solid gentlemen are of the ‘self-made’ order, and not a few rather glory in the fact that they have carried the lamp and swung the pick in their pre-millionaire days.”\textsuperscript{89}

Observers of the city supported claims of class equality with both republican political theory and direct empirical data on the conditions of the workers. Thurston argued that the cost of living was low for workers in Pittsburgh particularly because fuel costs were one third what they would have been in Cincinnati, Louisville or St. Louis.\textsuperscript{90} Claims that Pittsburgh wages were high and the cost of living low were important to portrayal of the city as a classless republic. Battles over the tariff, very important to the American iron industry were often couched in terms of the protection of republican virtue. A pro-tariff Scientific American article from 1869 featured Jones and Laughlin’s American Iron Works as an “an example of American enterprise and pluck” in need of government protection because of the high cost of American labor. It used this exemplary mill in the nation’s exemplary industrial city to argue for its position on national industrial policy.

The article celebrated the high standard of living available to the American laborer, attributed to the availability of land on the frontier continually tempting workers to set up
independent farms or to work as well-paid farm hands. With labor scarce and land abundant, American laborers were “now happy in the possession of a comfortable home, a family well clothed, housed, fed and educated.” American workers contrasted sharply with “the English operative whose only ambition is to stolidly and stupidly perform his daily task, and whose highest idea of enjoyment is, at its close, for a brief hour to smother and drown his feelings of wretchedness in tobacco smoke and beer at a pothouse.” The article worried over the future of Pittsburgh’s iron industry without a strong tariff and feared for the virtue of American workmen without the high wages the tariff made possible. The American Iron Works was an example of “the rapid growth of American manufactures when circumstances do not oblige them to compete with European labor” The article urged adoption of a consistently high tariff to prevent “the destruction of legitimate and healthy business, and the depression of honest toil.”

Like Pittsburgh’s early visitors, discussed in the last chapter, Keeler and Fenn pointed to coal’s abundance – along with high wages – as a source of class equality. Glazier argued for the importance of the “prosperity of the masses” to justify the high wages of Pittsburgh workers, not from a concern for republican virtue, but out of interest in increasing demand for goods in service of prosperity for all. He nonetheless adopted the republican ideal of relatively equal wealth distribution, arguing that high wages for workers which then create greater demand for goods “mean... all the difference between good and bad times, between a prosperous country, where all are comfortable and happy, and a country of a few millionaires and many paupers.” An 1880 Harper’s article claimed that the desired worker prosperity had already been accomplished in Pittsburgh: “Many professional men of liberal education would gladly earn the salary paid the
Pittsburgh steel-melter.”⁹⁴ Glass blowing remained an occupation of consummate artisanal prosperity and well-being. The blower “defies machinery, lives to a good old age and surely earns his twenty five and fifty dollars per week.”⁹⁵

Yet, republican classlessness was not simple worker prosperity or equality of resources for these writers. It rested on a kind of independence to which Jefferson had argued only agriculturalists could aspire. Keeler and Fenn described a Pittsburgh phenomenon, the “family coal mine,” as evidence of “the wealth of even the humblest resident of this extraordinary city.” The family coal mine functioned politically much like the family farm. The writers took the family coal mine as evidence of the “bounty of nature to all classes of people within the circle of the Pittsburgh hills.”⁹⁶ Republican dignity was not reducible to material abundance but was supported by it. It was republican dignity to which Parton alluded he described in wonder the experience of interviewing local miners who introduced themselves as “Mr.”

Keeler and Fenn regarded the Pittsburgh region’s workmen as “independent and almost as prosperous as their employers.” Prosperity supported republican independence based on possession of a competence. Republican equality supposedly shone forth in class relations. Both Parton and Keeler and Fenn claimed that employers and workers were on better terms in Pittsburgh than in England’s industrial cities. Parton noted the absence of the “infernal feeling” between the classes evident in English towns like Sheffield and Birmingham.⁹⁷ Universal industry, as well as a subversion of class expectations supported such relations. Workers had high wages, a low cost of living and sufficient leisure⁹⁸ and employers, particularly, were not drawn into luxurious pursuits. Class boundaries were permeable. Keeler and Fenn asserted “It might...be a matter of
doubt whether the Pittsburgh workman does not have a happier time of it that the overworked manufacturer.”

Republican equality could also be equality of cultural attainment. Keeler and Fenn profiled the conductor on the sleeping car taking them to Pittsburgh who was able to share with them “joint ecstasies over the landscapes of Turner” and speak “familiarly and lovingly of the great pictures in the Louvre and Vatican.” Parton made the same point by pointing out the neglect of the arts by Pittsburgh’s elites.

Pittsburgh’s republican characteristics were eminently suitable for living with smoke. Glazier in 1883 claimed that “[Pittsburgh’s] inhabitants are all too busy to reflect upon the inconvenience or uncomeliness of this smoke. Work is the object of life with them. It occupies them from morning until night, from the cradle to the grave, only on Sundays when, for the most part, the furnaces are idle, and the forges are silent.” This view, developed earliest and most fully in Parton, saw the city’s worker-centered republicanism as enforced and supported by smoke. Smoke was evidence of industry – both as activity and as moral virtue. Pittsburgh was a city without idleness. Smoke and soot enforced other virtues as well, sullying possessions and so protecting against vices of extravagance, frivolity and personal and domestic vanity. As we have seen in the previous chapter, Parton associated Pittsburghers’ virtues with manliness and the vices they avoided with femininity.

There can never be any dandies here. He would be a very bold man indeed who should venture into the streets of Pittsburg with a pair of yellow kids upon his hands, now would they be yellow more than ten minutes. All dainty and showy apparel is forbidden by the state of the atmosphere and equally so is delicate upholstery within doors. Some very yong girls, in flush times, when wages are high, venture forth with pink or blue ribbons in their bonnets, which may, in highly favorable circumstances look clean and fresh for half a mile; but ladies of
standing and experience never think of such extravagance and wear only the colors that harmonize with the dingy livery of the place."104 Smoke obliterated both gender and class differences. If consumption was a primary marker of class, Pittsburgh was a place of little class division: smoke and universal hard work limited consumption. According to Parton the “proprietor[s] in... extensive ‘works’... [went] about not quite as well-dressed as the workmen.”105 Smoke was the product of republican industry, and republican austerity and consequent equality were enforced by it.106

Keeler and Fenn discuss what Parton and others saw as republican austerity and equality in terms of the more generally desirable virtues of “good nature” and “patience.” They praise the good nature of Pittsburghers “from high to low” as due either to “their health or their general prosperity or the patience in which their smoke teaches them to possess their souls.”107 Echoing Parton they contend that this patience is primarily inculcated through the enforcement of “the sumptuary law proclaimed from every chimneytop” of which women are the chief objects:

I have before alluded to the patience in which the smoke and soot teach the inhabitants of these cities and boroughs to possess their souls. There are many odd compromises made by the sex with the sumptuary law proclaimed from every chimneytop against gay bonnets and bright dresses and Providence tempers even the barber to the shorn black lamb of Pittsburgh for the hand that shaves you washes your neck and ears.108

Unlike Parton, but perhaps in reaction to his views, Keeler and Fenn suggested that elites did not restrain their cultural expression and consumption within doors.

In the private residences of the well-to-do Pittsburghers one finds, shut away as much as possible from the smoke and soot in which their masters spend their days, the substantial comforts and luxuries of prosperous American homes everywhere. The stranger approaching one of these houses on a party night will be struck with the darkness and gloom which it presents from the outside. On
entering, he will find it all a blaze of light and toilets. The blinds are shut and the windows battened down to exclude the subtle enemy of ladies’ gloves and laces. There and there alone, he will find the fair of Pittsburgh in bright attire.\textsuperscript{109}

They alluded to Parton’s views of smoke’s limitations on consumption, if only to elaborate on the exception that proved the rule: “The dark livery (Parton’s word) which they wear in respect to King Coal is abandoned for a single gala night.”\textsuperscript{110}

Despite the seemingly universal consensus about Pittsburgh’s republican harmony, outside of the literary realm, discord was difficult to overlook. Republican ideology came into direct conflict with the assumptions driving the efforts of employers, that the price paid for labor was just one more cost to be minimized in service of their absolute right to unlimited accumulation. Contrary to Parton’s portrayal of the classless republic of smoke, Pittsburgh in the late 1860s and 1870s was a hotbed of class disharmony. As we have seen above, 1867, the year of Parton’s visit, saw definitive strikes both among the iron puddlers and among glass blowers, paradigmatic groups of republican workers.

In the aftermath of the 1877 Great Railroad Strike many of the tensions that had simmered below the surface in the immediate post-bellum period had bubbled over. Glazier’s 1883 piece identified what had previously counted as supports to dignity and virtue as threats to the republican vision. Unlike Parton and the other authors, Glazier saw workers’ virtue as somewhat deficient in Pittsburgh. While concurring with other authors on the liberality of Pittsburgh’s wages, he took them not as guarantees of republican dignity but as occasions of sin. While both Glazier and Parton discussed the need of workers to understand political economy, Glazier complained that: “Too many workmen... have no comprehension of the dignity of their own position” that is, of their
worth as republican citizens. Instead, workers “live only for present enjoyment, spend
their money foolishly, not to say wickedly, and on every holiday give themselves up to
that curse of the workingman – strong drink.” Worker ignorance and vice were to blame
for any worker oppression. Glazier pinned his hopes on the Knights of Labor which
substituted for pre-existing trade unions, which had brought “violent and disastrous
strikes” like that of 1877 to the city. He claimed that the “institution and spread of the
Knights of Labor has rendered another such strike an impossibility” since the Knights
tried “to settle, as far as possible, the difficulties between employers and employees by
arbitration.” Glazier hoped that the extensive Knights membership in Pittsburgh would
“eventually result in a better understanding between capital and labor, and in a
recognition of the fact that their real interests are identical.” As we will see below,
however, employers specifically targeted the Knights when they sought to use natural gas
to eliminate the jobs of coal haulers and heavers.

While tensions within republicanism were evident in labor relations from the
1860s on, national writers seemed to be oblivious to them until the 1877 strike. Parton,
however, exposed class tensions in Pittsburgh a decade earlier in his discussion of smoke
and suburbanization. Neither Parton nor local writers were completely blind to the effects
of new wealth on the habits of industry and austerity they celebrated. Yet only Parton
assimilated these tensions to contradictions in environmental attitudes.

Most writers claimed that Pittsburgers gloried in their smoke. Yet Keeler and
Fenn argued that Pittsburgers did not want to speak of smoke and “cannot bear to have
it alluded to by strangers.” A Harper’s article from the same year, however, described
“The dense volumes of black smoke pouring from hundreds of furnaces, the copious
showers of soot, the constant rumbling of ponderous machinery, the clatter of wagons laden with iron...” But it argued that “the black canopy is the ‘pillar of cloud’ to Pittsburghers, assuring them that the vast industries are still prospering.”

Tolerance or celebration of smoke in Parton’s Pittsburgh rested on the strength of the mutually reinforcing values of the frontier and of strict republican rectitude. A Pittsburgher genuinely weary of the city’s smoke might not be rugged enough for the frontier or virtuous enough for the republic. If such smoke-weary Pittsburghers were in evidence in 1868, then perhaps frontier and republican bandaging would prove inadequate to the strains of Pittsburgh’s industrial transformation.

Scotch-Irish austerity and industry mirrored frontier stoicism and boldness. Many saw such austerity and industry as chief characteristics of Pittsburghers. Parton used smoke ironically to poke fun at his own celebration of these civic virtues. Parton tells a story of a dark November day on which he believed the city around him to be awake and at work several hours before dawn, only to find that smoke had darkened the morning to such an extent that what he had thought of as five in the morning was really quarter to nine. Keeler and Fenn, writing three years later and perhaps following Parton, whom they explicitly discuss in their article, indulge in the same conceit. An unexpected knock on the hotel room door awoke the journalists from their sleep in the Pittsburgh darkness. It was, their amused guide assured them “already nine o’clock, and one of the pleasantest days of the year.” The industry of would-be early risers in these articles is an illusion created by smoke.

G. F. Müller writing for Harpers’ New Monthly Magazine in 1880 claimed that the “true Pittsburger glories in his city’s name, in her wealth, and generally speaking, in
her dirt. Her densest smoke is incense in his nostrils, and his face brightens when, in
approaching the grimy burg of his nativity, he sights her nimbus of carbon from afar, or
after night-fall her crown of fire...” Yet, not all Pittsbughers sought to build their
residences where smoke was thickest. As we have seen above, escape from smoke was a
major impetus to suburbanization in Pittsburgh. Thurston called the coal smoke “more
objectionable to strangers than natives” but sought to redeem the city by pointing out the
easy access that could be enjoyed to smoke free suburbs. Parton too had noted the
beginnings of suburbanization in 1868 and linked it with a desire to flee the city’s smoke.

Suburbanization was a strong force in post-bellum Pittsburgh and it was closely
linked to pollution distribution. Industrial change and concomitant population growth
would destroy both the walking city and the domination of working class culture by the
last decades of the nineteenth century. They would undermine the classless republic of
virtuous industry shaped and signified by the smoke that Parton had described.

Parton’s reflections on suburbanization laid bare some of the inconsistencies in
Pittsburghers’ pro-smoke rhetoric. Parton struck a pose of puzzlement about what might
motivate suburbanization since health claims made for smoke should have discouraged
movement out of the city air.

He [the Pittsburgher] insists...that the smoke of bituminous coal kills malaria, and
saves the eyesight...the smoke, so far from being an evil, is a blessing...it destroys
every property of the atmosphere that is hostile to life. In proof of which the
traveler is referred to the tables of mortality, which show that Pittsburg is the
most favorable city in the world to longevity. All this is comforting to the
benevolent mind. Still more so is the fact, that the fashion of living a few miles
out of the smoke is beginning to prevail among the people of Pittsburg. Villages
are springing up as far as twenty miles away, to which the business men repair,
when, in consequence of having inhaled the smoke all day, they feel able to bear
the common country atmosphere through the night. It is probable that, in coming
years, the smoky abyss of Pittsburg will be occupied only by factories and
‘works’ and that nearly the whole population will deny themselves the privilege of living in the smoke. With three rivers and half a dozen railroads, the people have ready means of access to places of almost unequaled beauty and pleasantness.\textsuperscript{118}

Parton’s Pittsburghers, despite their protestations about the health benefits of urban smoke, were voting with their feet in favor of the less smoky countryside. Industrious Pittsburgh businessmen had begun to put the luxury of comfort before the necessity of health. This pointed, as Parton’s sarcasm made clear, either to a deficiency of virtue on the part of the businessmen or to an incorrect assessment of the health benefits of smoke.\textsuperscript{119}

As we have seen, the identification of virtue with work alone and vice with concern for health and home comforts created significant tensions in Pittsburgh’s civic life in the 1860s and 1870s. Changing views of cleanliness, virtue, and economic good would redefine smoke’s relation to health, and health’s relation to comfort, over the course of the next several decades. Parton’s businessman was not alone, however, in his view of smoke as healthy: in the 1870s and 1880s, the Board of Health connected Pittsburgh’s relatively low death rate from consumption to the healthfulness of Pittsburgh’s smoky air.\textsuperscript{120} Despite growing suspicion of all urban dirt between the 1870s and the 1890s, smoke’s status as an inorganic antidote to organic atmospheric poisons and the (initially anecdotal) epidemiology that connected smoke and coal dust to low tuberculosis death rates made it difficult to claim unequivocally that smoke threatened health. Smoke remained, at least in the eyes of some, an unpleasant but beneficial medicine until the end of the century. For ever larger numbers of local residents, however, it was a medicine they were more and more reluctant to swallow.
As illustrated above, residential flight evinced a growing concern in this period with environmental amenities and the quality of domestic life. This concern had a several interrelated sources. Mutually reinforcing factors helped to break down strong associations between smoke, austerity, industriousness and the common good. Among them were (1) the movement of environmental amenities onto the civic agenda as part of a national trend toward such service provision; and (2) a greater regard for comfort and health among Pittsburgh’s working class population, growing both from labor reform’s interest in domesticity as a pillar of temperance and the linkage of working class domesticity with increasingly besieged republican defenses of the right to a competence. These cultural changes were reinforced by increasing residential segregation of the classes and eventually by the addition of natural gas to the list of newly available municipal amenities. The advent of natural gas would introduce a third factor that would work to break links among the elements of the republican virtue complex: (3) the rise of aesthetic considerations as business interests for those newly invested in real estate and retail – resting on Pittsburgh’s incipient elite leisure culture.

In Pittsburgh, between 1870 and 1890, increasing residential segregation by class and wider availability of environmental amenities for the middle class coincided with declining environmental conditions due to crowding caused by rapid population growth, increased pollution due to intensive industrialization and segregation of the poor in neighborhoods not provided with new municipal amenities. Pittsburgh’s working class mortality was high during these years and the gap between middle class and working class death rates grew. Just as Pittsburgh’s smoke levels increased dramatically during and after the Civil War, environmental amenities and pollution burdens began to be
distributed more unevenly among the classes. Middle class Pittsburghers had increasing access to municipal amenities like water, sewerage and natural gas as they moved into new class-segregated neighborhoods. Environmental conditions in the form of the provision of municipal services became part of the city agenda during the 1870s and 1880s. Pittsburgh energetically expanded efforts to provide water and sewerage during these years, but it did so unevenly and inadequately.\footnote{122}

The decline in conditions for the working class was politically troubling in light of residential class segregation and an improved environment for the middle class. During this period, the domestic environment took on new significance for working class people who were frustrated by their unequal access to environmental amenities. In reaction to local conditions, as well as in accordance with national trends, Pittsburgh’s working-class community began to emphasize ideals of domesticity in the 1870s and 1880s.\footnote{123} For both the middle class and for workers, domestic amenities were linked with a certain expected level of comfort and also with protection against environmental threats to health.

Labor’s increased regard for the home was connected to conceptions of what was necessary for republican virtue – during a time when labor’s republican entitlements were under threat from employers and republican responsibility was seen by labor leaders to be threatened by the character deficiencies of workers themselves. Republican citizens were to participate in the decisions of their community and needed to be suitably virtuous to do so. Yet labor leaders worried that working class culture contained elements that could subvert the virtue necessary in republican citizens. Although they did much of their organizing through the venues of working-class public leisure, they sought to reform it
through temperance crusades and other measures. (As we will see below, such measures split the working class making it vulnerable to the advances of machine politicians who campaigned through working class leisure institutions.) Labor reform’s attempt to remake working class leisure also strengthened regard for the working class home, in part, as an alternative leisure venue to the saloon.\textsuperscript{124}

In the late 1870s and into the 1880s, republican ideology and labor rhetoric magnified the importance of working class domesticity. In these same years working class consumption rose, as evinced by an increasing number of advertisements for non-essential commodities in the labor press. Morality, consumption and health concerns reinforced interest in the home.\textsuperscript{125} Such orientations help to explain skilled workers’ environmental attitudes over the next several decades, as we will see below. By the late 1880s and early 1890s, Pittsburgh’s foremost labor paper, the \textit{National Labor Tribune} would connect working class ill health with bad air inside the mills and without. The paper would be at its most militant when it spoke of the domestic needs of working class families. These assertions of rights were closely connected to the republican belief in the entitlement to a competence, which labor spokesmen insisted upon, even as employers directly and continuously attacked it.

\textbf{2.8 Technological Change and Transformed Meanings of Smoke}

While the experience of and attitudes toward domestic environmental amenity were being transformed and the social geography of the city reorganized to break connections between smoke and civic virtue, smoke’s intrinsic connection to the good of the city was also weakened by technological change. Steelmaking itself produced much less smoke
per ton of metal than iron-making, and Bessemer steel-making was initially presented as “making iron without fuel.” Yet, ironically, the production increases that would come with the shift to steel would increase the city’s overall smoke levels. However, the centrality of bituminous coal and its smoke to local industry was attenuated as important new natural resources were discovered and put to use in the region.

As we have seen in the previous chapter, oil was discovered up the Allegheny River from Pittsburgh in the 1860s and Pittsburgh became a major petroleum distribution center. Less than a decade after Huckenstine’s Appeal, rapid changes in metalworking and energy technology allowed even Pittsburgh’s industrial leaders to discuss smoke in a new light. Natural gas had been discovered locally in the process of drilling for oil. The new fuel had been used for illumination in nearby East Liverpool, Ohio in 1860 and was first used in iron-working in the Pittsburgh region in 1875 in the town of Etna, several miles north of the city. George Thurston in his 1876 history of the city predicted that natural gas would lessen the cost of manufacturing in Pittsburgh and that it most likely would be obtained not just in the oil regions but very near, and perhaps even within, the city itself. By the time of his writing the new fuel was already piped from Butler County to a few of the city’s iron mills. Spang, Chalfant and Co.; Graff, Bennett and Co.; and the Isabella Furnace piped natural gas seventeen miles into the city from their shared well.126 A large gas field discovered in Murraysville in adjacent Westmoreland county spurred efforts to pipe natural gas to Pittsburgh.

In 1883 the Penn Fuel Gas Company and others obtained charters under legislation allowing for the incorporation of manufactured gas companies. Even before the introduction of natural gas to the city, both manufacturers and well-to-do domestic
consumers were interested in alternatives to coal for heat and power. This interest was not unconnected with desires to rid factories and households, as well as the city itself, of the difficulties attending coal smoke and soot. In October 1881, the newly founded Engineers’ Society of Western Pennsylvania, an organization to which all of the city’s foremost industrialists\textsuperscript{127} belonged, had taken up discussion of smoke as an industrial problem. No longer did smoke in Pittsburgh simply mean industry; it also meant dirt and waste. Iron mill owner and Engineers’ Society President William Metcalf read a paper entitled “Some Wastes of Heat” which promoted the use of gas manufactured from slack, rather than solid bituminous coal, for iron-making. He bemoaned the transmutation of raw coal into “dirty useless smoke, and red, and far more expensive flames.” Slack gas, he argued, would save labor costs and increase productivity by improving working conditions, but not result in job loss and labor unrest. Metcalf claimed that workers would embrace the new fuel: “After the men have once worked on a gas furnace you cannot drive them away.” Pittsburgh employers were particularly concerned to prevent labor discontent in the early 1880s since the city had been a hot spot in the Great Railroad Strike of 1877. Metcalf argued:

...the work is so very much easier for the men that they naturally do much better work, because their labor is not so exhausting and they take more interest in it. This is a point of no little importance, for it is easy to obtain a very high quality of finish at no increase of cost and when men are contented the troubles of the “bosses” are very light. No account has been taken of the wages question, because with the above stupendous figures it is a question not worth considering in this connection; but it is a fact that men can do from 10 to 20 percent more work on a gas furnace than on a reverberatory; they can do it easier and they can do it better... Therefore the new style gives the working man a chance to make money too, without interfering with the present lists and the gas system requires as many hands as the others if not more therefore its introduction need cause no opposition.\textsuperscript{128}
Additionally, Metcalf asserted that gas would reduce wear and tear on furnaces caused by soot and that a higher quality product would result due to cleanliness and more even heat. According to Metcalf, cleaner working conditions and a cleaner city, like the interests of mill owners and ironworkers, coincided happily with the use of slack gas. Members of the audience at the Engineers’ Society expressed interest in the use of manufactured gas, at rates as cheap as those for coal, for domestic heating and cooking. The qualities that had made smoke environmentally objectionable in Huckenstine’s neighbor’s orchard had become equally undesirable inside the mill.

All of the advantages offered by manufactured gas were shared or surpassed by those of natural gas, which was half the price and double the heat value per unit volume. Natural gas for iron manufacture “by reason of its purity of flame, strength of heat, and absence of sulphur or other deleterious ingredients [was] without a peer.” Because no heat was lost in the opening of furnace doors for refueling, gas could create 25% more steam than the equivalent fuel value of coal (1 pound of coal = 7.5 cubic feet of natural gas). Natural gas was said to increase the output of metal furnaces by 15% by decreasing the amount of “burned iron” (presumably from coal burned at too high a temperature with too much oxygen). It was to save from 10-15 % of labor costs because of “the reduction of the number of hands required for the handling of the coal fuel, from 15 to 20 percent” and in the cost of the fuel itself to save almost 15%. In addition more was saved on all the parts of the furnace and mill that would have had to come into contact with coal. A steel plant that had needed $96,000 of coal to make 12,000 tons of steel now used $40,000 of natural gas to make the same and saved another $12,000 in not having to haul coal and ashes. Major savings were made in glass
making as well, along with quality improvement: “ordinary print could not be read through four thicknesses of the coal fuel glass, a newspaper could be read with ease through a box of 8x10 as the glass comes from the ordinary cutting table.” Glass retained its polish when made with natural gas and did not have to be polished before sale. Factories could make six instead of five batches of glass per week. Fuel cost savings overall were “possibly over 50 percent,” increased yields added 15 to 25 percent, and improved quality 10-20 percent (though this factor was admittedly hard to estimate).

General use of natural gas as a manufacturing fuel dated from July 1884 when George Westinghouse and others organized the Philadelphia Company. In that year, Westinghouse drilled the first usable gas well within the city limits – in the wealthy residential neighborhood of Homewood. The gas supplied his own house, replacing the manufactured gas he had been using. During these early years of natural gas there was no way to plug the discharge from wells. Westinghouse burned off excess gas from a standpipe in his yard creating a continual roar and plume of flame that could be seen throughout the neighborhood. Even larger “pillars of fire” were visible at each gas well in the surrounding region. Once gas was piped into the city itself, fifty-foot standpipes were erected in public squares to burn off the excess. A new kind of technological spectacle had come to Pittsburgh. By 1886 natural gas was used in 3000 homes, 34 iron and steel mills, 60 glass factories and 300 “smaller factories and hotels.” Pittsburgh had 363 miles of pipes with 66 miles within Pittsburgh city limits.

George Thurston captured the magnitude and novelty of this transformation in his 1888 history of Allegheny County:
The bringing of the gas to the city and its efficient distribution in the short time occupied is in itself a subject of wonder....to lay in the short number of months taken miles of pipes from 10 to 36 inches in diameter from wells 15 to 20 miles away, and through the paved and built up streets of a great city, through net works of water and manufactured gas pipes, to convey as explosive and inflammable a substance as natural gas... is a great feat of engineering. The transformation in all things, whether in the factory or the household, was almost like a page out of the Arabian Nights..... And to the people of Pittsburgh it is still a wonder and almost unrealizable.142

Thurston praised natural gas’s economic and aesthetic benefits in the same breath:

It has placed the manufacturers of Allegheny county on an eminence that, where fuel is the factor, and the improved quality of the product the consequence of that factor, they can not be competed with. It has made the city one of the pleasantest cities for residence in the United States, reduced the work of the household and added to its cheerfulness and beauty in the absence of the drudgery grime and debris of the coal fires it has banished.143

The first substantive section in Thurston’s 1886 survey of the city was entitled “The Vapor Fuel.” He began that section with the phrase: “There is but one Pittsburgh.” Rapid technological change seemed to threaten the city’s uniqueness. Yet, Thurston argued that just as railroads had now proven to be an even bigger transportation advantage than rivers, natural gas would prove to be an even more powerful fuel advantage than abundant coal.144 He proclaimed, with his perennial optimism: “Great as has been the power of coal to give manufacturing advantages...yet greater will be the power of Natural Gas. Pittsburgh has been the first to utilize and bind this new power to her car of progress.”145

The future of natural gas in Pittsburgh was subject to particular technical questions. Would natural gas be uniquely available within a thirty or forty mile radius of Pittsburgh, allowing Pittsburgh industry to rely on its monopoly of the fuel to underprice competitors just as it had for coal? Even if natural gas was to be found elsewhere,
Pittsburgh’s unique position could be assured by an affirmative answer to another question. Would natural gas be found in close proximity to Pittsburgh’s established industries, within the city limits, perhaps right on the premises of manufacturing sites? If so it would provide a source of fuel virtually free of acquisition, transportation and labor costs:

If as indications give every reason to believe, this gas should be obtained from the very ground upon which the factories of Pittsburgh stand, there will be at her command a fuel which, surpassing even her coal for quality in its application to the reduction and manufactures of metal, will be of almost inconceivable cheapness. Shooting up of its own force from the depths of the earth and needing but to be distributed in pipes to the furnaces and forges or such fires as are needed for manufacturing purposes for the creation of steam it will be seen the cost of such fuel will be very small.146

Pittsburgh was best suited to use natural gas because of the industrial advantages it already possessed. This combination of advantages insured its supremacy in gas-based manufacturing even if natural gas was discovered in abundance elsewhere. Without its other advantages (the city’s) natural gas “might be a curiosity but not a power.”147

Emphasis on Pittsburgh’s historically accumulated combination of advantages was a new twist on extractive instrumental valuation of the city. As new technologies seemed to undermine individual advantages at every turn, the city could best maintain value by presenting itself as a historical whole: “Research may discover localities where greater natural facilities exist than here; be that as it may, at present there is but one Pittsburgh.”148

The May 1884 meeting the Engineers’ Society hosted the semi-annual convention of the American Society of Mechanical Engineers, and their joint meeting featured the presentation of the report of the local group’s Committee on Natural Gas. Metcalf and others discussed newly available natural gas in much the same terms they had applied to
manufactured slack gas. Metcalf was active in debate following the delivery of the report. Despite his earlier enthusiasm for slack gas, he was not immediately converted to the advantages of natural gas and repeatedly called for a comparison of the cost of natural gas, manufactured gas and raw bituminous. In response to Metcalf’s demands, one of the other speakers, William Jones, the superintendent of Carnegie’s Edgar Thompson Works, pointed to the elimination of union labor as a chief contributor to the value of gas over coal:

In regard to the question as to the commercial value of the gas, if Mr. Metcalf has been bothered with 82 firemen and coal heavers, as I have been, one half belonging to the Amalgamated Association and the other half to the Knights of Labor, he would be glad to get the gas at any price. Whenever I went to that boiler house I felt as if I was going inside the walls of a penitentiary and everyone looked at me as if to say ‘have you got permission to come here?’

These observations destroyed the happy coincidence predicted by Metcalf (from the use of slack gas) between environmental improvement and the interests of workers and employers. Indeed, the adoption of natural gas arose from mixed motives toward, and would have mixed results for, Pittsburgh’s workers.

By June 1884 the industrial substitution of natural gas for coal was well underway, and Pittsburgh entered its early “clean air period.” Coal consumption in the city would be temporarily reduced, but by 1892 would rise to surpass its former levels. Smoky days reported declined dramatically. From 1885 to 1890 smoky days per year varied between 0 and 20, with very few between 1887 and 1892. A converted Metcalf delivered his own paper promoting natural gas as a desirable smokeless alternative to bituminous on November 18, 1884.
George Thurston, who had extolled the wonders of the Pittsburgh—“glowing with the blaze of hundreds of furnace fires, swart and grimy with their smoke...”153 and who had dismissed the difficulties of Pittsburgh’s smoke by pointing out its easily accessible smoke-free suburbs, now celebrated the cleanliness made possible by natural gas:

The transformation in the appearance of the mills and factories is almost incredible, so rapidly has it been done, and the change is still going on, because gas fuel brings in its use improved processes of production, economies of cost in manufacturing, cleanliness, superiority of product and increased yield from material.”154

Thurston said that natural gas “is thus transforming Pittsburgh into the cleanest manufacturing city of the world.”155

Henry Tyrrell of Frank Leslie’s Popular Monthly cast aside the Smoky City image when he reported on the city in “Pittsburgh’s Flames and Forges” in November 1888. The article began with a description of the haze that led to Pittsburgh— the city described as Vesuvius-like and as “Vulcan’s own valley.” Yet, Tyrrell expressed surprise that this city was the “the Smoky City upon which so many writers have lavished their opprobrious epithets, and which artists have depicted with such a lurid extravagance of lampblack.” Tyrrell described the changed appearance of the city due to the adoption of natural gas: “Fresh green shade trees, ...newly painted buildings...cream colored granite walls...a spic and span block of the new regime” next to “a dingy-looking row of buildings whose walls, irrespective of their original colors, years of soot and smoke and have dyed to a uniform black.” Though smoke was gone, Pittsburgh’s air was not completely clear: “over all the vast and complex scene hangs – not a black pall as in the days when Bitumen was king, but a light gossamer veil of gray, deepening a little perhaps...where the iron and steel industry fairy runs riot, yet never dense enough to
obscure its noble features.” The new haze was a “soft vapory cloud [that] takes on the roseate tinge of morning, darkens to steel-blue beneath the thunderstorm and kindles gloriously at the fires of the setting sun.” The article referred to its “shades of topaz and pearl” describing a city in which “...the blazing torch of a lighted natural-gas outlet pipe; the electric lights, cold by contrast, glitter like blue diamonds; while dominating all even to the stars of the firmament, leap and glow the fires of the mighty elemental struggle of a hundred furnaces.” The article took Richard Realf’s “Hymn of Pittsburgh” to capture the city well – reprinting it in full. Yet it claimed that the “good fairy” of natural gas had “exorcized that grimy demon of smoke.” Pittsburgh stood poised between underworld and fairyland.156

Despite its use earlier of the prevailing imagery of Vulcan, the article claimed that Pittsburgh under natural gas

might be allegorized as a beautiful Amazon, seated at the Ohio’s gate upon a throne of steel, with a pedestal of coal and a canopy of glass, wrapped in a robe of flame with a fichu of smoke, a necklace of electric lights, and a fiery crown of natural gas, burning sapphire-blue and ruddy gold where its fringed edged faded into quivering air. 157

One further technical question remained about natural gas: how long would the supply last? It was an open question for Thurston and his contemporaries whether natural gas was still being formed – perhaps coal became petroleum and petroleum became gas underground.158 In 1886 Thurston was willing to say that the “immense quantities” of natural gas issuing from wells were “almost beyond comprehension” and that the gas supply was therefore “presumed to be inexhaustible....” in the short run.159 The bigger question practically, for Thurston, was whether the gas supply would be sufficient for two or three generations.160
The 1889 *Pittsburgh and Allegheny Illustrated Review* speculated confidently on the longevity of the supply:

As to the permanency of the supply of this great product, there are various opinions advanced, but the consensus of theories upon the subject seems to be that if the supply is to be at some period of the future exhausted, it will be so remote as to make but little difference in the plans of the present and several future generations.161

The answer to the question of the stability of Pittsburgh’s natural gas supply would have an enormous influence on the further development of the city. Yet, an austere republican citizen would have regarded with indifference many of the benefits Pittsburghers sought to retain in hoping for a continued supply of natural gas. A city history from 1889 contrasted old and new conditions in Pittsburgh:

The transition from the use of coal to that of this non-producer of smoke has been simply wonderful....The black pall-like cloud has disappeared; the atmosphere is cleaner than that of most western cities, and the temptation to use bright colors in home-ornamentation is steadily growing....for heat, its use for cooking, for heating rooms, for keeping greater illuminating power...it is unapproachable by any other fuel. It does not need to be carried in and about, like coal; it makes no ashes, and consequently makes no dust, and can be regulated at will. It saves great labor to the housewife and reduces the tug and toil of housework to a minimum....it is an invaluable heating agent, clean and labor-saving; and it has proved a godsend to Pittsburgh in providing heat that needs no handling of materials, makes no dirt, does its work better in every way than coal, and has rendered the city much more tolerable to occasional residents.162

Embracing domestic and workplace cleanliness and convenience, home ornamentation and the elimination of the jobs of miners and coal handlers, Pittsburghers still pretended that it was their visitors and not themselves who really minded the smoke. Despite this protestation the writer appeared no less ready to give up a republican orientation to Pittsburgh’s smoke. Similarly, this local writer rejected Pittsburgh’s colonial and frontier
identity. He posited an essential discontinuity in Pittsburgh history in the adoption of natural gas. He associated coal with Pittsburgh’s colonial past.

The men who, in 1760, were forced to climb the almost perpendicular face of Coal hill to mine the coal that outcropped there, loaded it in sacks made out of oxhides and then tumbled the loaded sacks down the hill to its foot, for transport across the river to Fort Pitt, would have been more astonished than the crew of Columbus were when America was discovered, could they have seen the advent of natural gas.\footnote{163}

Pittsburgh transformed by the new fuel was no longer the Old World characterized by reliance on coal. In this way, the history contrasted contemporary Pittsburgh under natural gas with its coal-based frontier past. The permanence of such an essential transformation depended on the accident of continued supply. The same city history expressed concerns about the exhaustion of local wells.\footnote{164}

Natural gas seemed to threaten one strain of Pittsburgh’s republican and frontier mythology. In the views of those who celebrated natural gas, austerity and stoicism in the face of smoke’s discomforts were no longer necessary supports of industrial boldness and civic virtue. Natural gas would, however, have ambiguous significance for Pittsburgh’s skilled workers. They instead took natural gas itself as a support for republican entitlements. Skilled workers in Pittsburgh’s nationally known labor paper the National Labor Tribune\footnote{165} also rejected the connection between smoke and republican identity.

2.9 Skilled Labor On the Natural Gas Supply: A Defense of Republican Entitlements

By 1884 the National Labor Tribune had taken up the topic of natural gas in the mills. Workers initially opposed, but then supported, natural gas. At first, workers feared the otherworldly qualities and insidious nature of natural gas and worried about the loss of
mining employment they believed it would bring. Eventually, however, practical misgivings gave way to faith in technological beneficence: “Let us quietly keep pace with our times, and if gas shall prove itself to be a benefit to other industries let us thank science for a great benefaction and make the most we can of it.”

Workers, as is clear from NLT columns, were enthusiastic about technology in general and debated the merits of new ironworking methods in the pages of their paper. This is surprising given that technological improvements in ironmaking and the Bessemer process were being used aggressively by employers to de-skill, reduce shop-floor power and lower wages. Contrasting attitudes toward technology and labor reflect the differences between the iron industry, still dominated by skilled labor on whom employers were dependent, and the steel industry, employing a less skilled and more replaceable workforce. The NLT’s enthusiasm for technology harkened back to the practices available to employers in the era of the puddling bottleneck when the only way to improve production was to raise output for individual puddlers. Because puddlers were paid according to how much they produced and not by the hour, any efficiency gained through technology benefitted both puddler and ironmaster in non-Bessemer mills. Ironworkers therefore were accustomed to regarding technological improvements that raised output as offering them direct material benefits. Skilled ironworkers dominated the staff and readership of the NLT.  

The introduction of natural gas into Pittsburgh’s mills severed links noted by Parton between dirt and workers’ manly virtue. In January of 1885 the NLT emphasized this in an article it reprinted from American Manufacturer on glass production with natural gas:
The visitor sees no coal, no wood, no cinders. No ashes and no smoke.... No grimy stoker sweats his life away at furnace doors but instead a calm person with a stained glass shield invites you to look at the glass through the open furnace doors.\textsuperscript{169}

A calm person with a stained glass shield was to be preferred to the “grimy stoker” – providing sharp contrast with Parton’s vision of Pittsburgh’s industrial manliness.

Environmental values previously described as feminine and vicious would shape general civic ideals. Workers would assert claims to environmental “luxuries,” to be enjoyed both at home and in the workplace, unimaginable from Parton’s grimy and classless industrious republicans. As this image suggests, natural gas would change the tenor of life in glassworks and mills, and in the city. The skilled workers of the NLT did not interpret these transformations as a simple story in which the values of production (jobs) were neatly opposed to values of consumption (environmental amenities for elites).\textsuperscript{170} Class interests and technological enthusiasm, environmental and industrial values, all coincided in their discourse, just as William Metcalf might have predicted.

Most of the NLT’s discussion of fuel technologies and of smoke took place in the context of worries about a failing natural gas supply. Men in the mills were first to notice the gas shortages that foretold the return of coal and smoky skies. From 1885 on, industrial workers monitored the fluctuations in the natural gas supply to the mills. By late 1885 the NLT acknowledged unsteadiness in the natural gas supply,\textsuperscript{171} and by early 1888, reported that some puddling furnaces were outfitted to change, mid-heat, in less than five minutes, from natural gas to coal.\textsuperscript{172} Concern over gas shortages intensified by 1888.\textsuperscript{173} The NLT published over fifty articles between 1888 and 1893 on the prospects
for Pittsburgh’s natural gas supply and on possible substitutions of cleaner fuels –
everything from manufactured gas to edible nuts – for coal.¹⁷⁴

From the very beginning, ironworkers complained about the unpredictable supply
of natural gas. The supply’s unreliability caused puddlers’ outputs and wages to decline
drastically, and changed their “customary hours,” defended previously in strikes. It is
possible that employers who adopted natural gas as a means of doing away with the labor
of haulers, coal handlers and puddlers’ helpers, and who sought to undermine the
strength of organized labor of which the puddlers were the backbone, were only too
happy to see the puddlers weakened by fluctuating supply. Workers themselves however,
did not blame employers directly for their difficulties with natural gas. Instead they
blamed Pittsburgh’s Magee-Flinn political “Ring” for granting a natural gas monopoly to
George Westinghouse’s Philadelphia Company.

To understand the NLT’s attribution of blame for difficulties with the natural gas
supply, one must understand something more about Pittsburgh politics, particularly labor
politics, in the period. Urban politics both drove and reflected changes in the relative
strength of working class and elite culture. This period saw the rise to power of the
Magee-Flinn political machine, heavily involved with the city’s leading industrialists
including Andrew Carnegie, H.C. Frick and the owners of the Pennsylvania Railroad.
Despite these strong connections to industrial barons, the Ring, through its embrace of
working class leisure venues rejected by labor reformers, was able to portray itself as
supporting the interests of labor to large fragments of the working classes. By the 1880s,
under the multiple threats of working class fragmentation and Machine seduction and of
technological and coercive assaults on shop-floor power and unionization, Pittsburgh
labor was definitively declining and becoming conservative, especially after the Great Uprising of 1886. Both labor’s ability to field independent candidates for public office and the power of labor unions declined in the last quarter of the nineteenth century. (Nonetheless, between 1887 and 1894 there was a great deal of labor unrest in Pittsburgh, almost as much as in New York and Chicago – and this for a smaller city.) The loss of the Homestead Strike in 1892 marked the end of unions in steelmaking in the region until the 1930s. While this decline in the power of labor is visible in hindsight, the remaining Pittsburgh puddlers, even in the 1880s, were still the backbone of the unions and of the NLT. They embraced a strategy of non-confrontation with employers due to their weakened position yet clung both to their artisanal faith in the benefits of technology for the individual puddler and to the republican ideal of a cooperative commonwealth in which monopoly was an enemy that all producers could in unity oppose.

After 1888, as natural gas prices rose, industrial demand for coal went up, and smoke began to return, the NLT complained both about the scarcity of natural gas and about the consequences of returning to the use of bituminous coal. In November 1888 the NLT ran its first “smoke consumption” article describing how coal burning could produce “perfectly pure air...with ...not a trace of smoke or fume...visible to the eye...not a taint of any kind...perceptible to the taste or smell,” and concluding that it was “easy and economical to obtain the utmost amount of heat from coal without any deterioration of the atmosphere.175

The NLT saw a return to raw bituminous as “unscientific,” and featured many articles on alternative fuels, especially manufactured gas.176 The paper gave special attention to by-product processes for coking and for the production of manufactured gas
and steam. It saw by-product collection as the ultimate development of smoke consumption. While the NLT was enthusiastic about technology, it did not uncritically accept all technological change. Neither, however, did it dogmatically oppose technological change to workers’ interests.

The NLT’s intelligent and critical technological enthusiasm saw environmental concerns, production values, and technological optimism as allied rather than as opposed to one another. Even when natural gas had become much more expensive than coal, the paper lamented the return to “crude fuel” which it saw as in reality more costly, because coal was dirtier and produced inferior iron. NLT writers celebrated the determination of glass makers to continue making natural-gas-quality glass using manufactured gas. They praised these intentions as “well from every point of view” both for the sake of high quality glass and for avoiding Pittsburgh’s return to “its black vomit of smoke and soot.” In all of their rhetoric, environmental quality and “production values” were closely associated. So tightly intertwined were these concerns that a December 1890 smoke abatement editorial portrayed smoke as gloomy, not in its own right, but because it marked the return to use of raw bituminous in the mills:

Pittsburgh has been gradually hanging a black cloud curtain over itself the past month, a cloud that not only has detracted from the beauty of the clear atmosphere of the past four years, but which has had somewhat of a depressing effect because of its heralding a return to the inconveniences of crude fuel.

Heavy industry itself, as the NLT articles, Thurston’s descriptions and the Engineers’ Society discussions show, had its own reasons to value the amenities that Parton had taken as luxuries irrelevant to industrial values. In a time when, as the NLT put it, “aggregation of margins [was] made up of infinitesimals,” fuel savings and the
reclamation of by-products were indeed desirable. As was universally agreed, amenities like cleanliness, which could be enjoyed in the city and in the home, had also become important to the product and the production process.

The skilled workers of the NLT did not interpret Pittsburgh’s environmental transformations as a simple story in which interests of production (jobs) were neatly opposed to environmental amenities for elite consumers. The NLT’s skilled workers politicized conditions inside the mill through their newspaper and through collective action aimed at protecting the natural gas supply. Iron and steel workers explicitly linked the presence of these amenities inside the mills with their presence outside them. Workers’ class interests were more prominent in NLT columns about equal access to domestic environmental amenities than in those that focused on workplace issues. In the domestic realm, workers portrayed clean air and energy efficiency as interests that divided the classes. Pittsburgh’s working men complained of the mills’ environmental hegemony. After the full return of coal in the 1890s, millworkers saw their chief health need as the improvement (and affordability) of incline and streetcar transportation that would allow them, like James Parton’s businessmen in the late 1860s, to live further from the mills. Unlike Parton’s businessman, who spoke of smoke as beneficial but acted as if it were not, the NLT saw smoke as both uncomfortable and unhealthy:

To get rest one must have change, and there is very little change from a mill to a room close by where the atmosphere contains almost as much that is unpleasant and injurious as does the air in the works. With the three cent fare one may live a mile or two miles or even longer distance from the place of employment and at so much less cost as to fully cover the amount paid a transit company for daily passage.
They also complained of engineering, business and government policies that cast natural gas and electricity as luxuries suitable only for elites. They argued that gas, and eventually electricity, should be available cheaply for wage workers’ homes, and further urged that electricity production would only be efficient and cheap enough if it were also smokeless. In this way the NLT connected equal access to domestic amenities, with working conditions and product quality, to smoke-abatement. After the natural gas period, workers whose economic survival depended on the mills contended that the air in the neighborhood should be different from the environment inside the mill. This contrasts significantly with the attitudes expressed in the 1860s and 1870s by Parton’s Pittburghers and Supreme Court Justice Agnew.

Workers’ enthusiasm for the new fuel notwithstanding, natural gas was at best a mixed blessing for Pittsburgh labor. In fact, natural gas both created and eliminated jobs. The combination of the shift to Bessemer steel and the use of natural gas had led to huge productivity increases and huge profits, but it had eliminated jobs in mining and coal handling. Production increases, however, had allowed the United States to surpass Britain in iron and steel production by 1890.

Even though natural gas directly threatened republican mutualism, in an era of amalgamation, by eliminating jobs of coal haulers, handlers and miners, it seemed to support other republican ideals. The adoption of natural gas in the mills and its effect on the home environment seemed to skilled workers to help to satisfy their right to a competence. Skilled workers also clung to natural gas because of artisanal assumptions about their own self-interest. As Couvares notes, before the late 1880s iron manufacturers could only increase productivity by using new technology to “maximize the efficient
employment of skill.” Skilled craftsmen themselves participated in choosing which technologies to implement. Skilled workers “expected each increase in productivity to increase their return according to the negotiated scale.” Iron workers who resisted the loss of gas fuel therefore acted out of expectations of individual gain that were in keeping with their identities as republican artisans.  

2.10 The Wells Run Dry

An October 11, 1890 NLT column mentioned the visit of the British Iron and Steel Association to the city. One week later the NLT ran three articles on the same page chronicling the visit and their reaction, not only to the impressive scale of iron and steel-making in Pittsburgh but the wonders of natural gas. The paper chronicled “A Natural Gas Display” put on for the British visitors:

...a general rush was made for favorable points of view to witness the natural gas display of the Philadelphia Company...A huge stand pipe was pouring forth volumes of flame that was now white, now red, now green.... light from the blaze lighted up the valley for miles, the strong lights being reflected from the wooded hillsides. The various colors were given by chemicals placed at the end of the pipe. “Wonderful,” “Magnificent,” “How grand,” were the exclamations heard on all sides. The light subsided and disappeared leaving the valley in a darkness that was trebly intensified by contrast with the extreme brightness of a moment before. Suddenly from half a dozen pipes fixed on the bank directly in the rear of that first one rose a series of long lights that combined and made a wall of white flame fully a hundred feet high. When these had burned about five minutes they too, were suddenly extinguished and darkness once more enveloped the scene. A small light was then started and by its rays could be seen the water in the river boiling up as in a seething caldron directly in front of the boat’s bow. This light also went out, and a second after a broad circle of flame leaping twenty feet into the air was seen to be flaring from within the heaving water that rose to a height of five or six feet above the calm surface surrounding....Then to crown all, every pipe sent forth a glaring light ...”what horrible liars we shall be called when we get home.”
One wonders if the improvement in the natural gas supply described was orchestrated for the visit. Despite the impressive display marshaled for British visitors, the NLT’s November 1, 1890 lead article “Natural Gas in the Mills” announced that the Philadelphia Company “has notified mill owners of the district that natural gas will be cut off from puddling furnaces.”

By November 15, 1890 the switch-over of the mills to coal instead of natural gas for fuel had begun. Yet, production (and fuel consumption) had increased so much in the natural gas period that there were serious concerns about whether Pittsburgh had the rail capacity to transport the coal necessary to replace gas when the supply was cut off or ran out. The paper focused on the strain thus induced on Pittsburgh’s shipping capacities: “Pittsburgh’s industry is rapidly growing beyond her shipping facilities. The only obstacle now in the way of extension of production is room to ship to and from the mills the raw and finished product.” The NLT zeroed-in on the increased traffic in coal:

By the first of next month the change from gas in the mills will have been made to the extent of nearly 100,000 bushels of coal a day.... Everything will move along well enough until coal will have to be furnished to all the works, then it will make a line of railroad cars for coal alone over five miles long, besides a string much longer to supply the blast furnaces and take away the finished iron and steel. I notice the blockade already commencing, and the railroad companies are making all preparations to avoid it as much as possible... on both sides of the Allegheny river...all the side tracks are crowded....it is at this time that all furnace companies are getting their winter supply of raw material, and the shipments to the blast furnaces alone are over 1000 cars a day.194

The NLT on July 25, 1891 stated that “The prospects are that comparatively little manufacturing will be done with natural gas fuel within the corporate limits of Pittsburgh and Allegheny this winter.”195 By August 29, 1891 the paper was prepared to say that coal would replace natural gas for domestic consumption due to natural gas price
increases.\textsuperscript{196} and by late 1891 the \textit{NLT}'s reports on individual mills converged toward the almost universal replacement of natural gas by other fuels including raw bituminous coal.\textsuperscript{197}

A \textit{NLT} article from March 5, 1892 chronicled the rise and decline of natural gas over the course of the period. This article again was based primarily on information that was already two years old, information dating from a time when natural gas was in far greater use than in 1892. In 1890 there were, according to the article, 104 rolling mills and steel works using natural gas in the country, 96 in November 1887, 68 in August 1886, and 6 in September 1884. The paper celebrated the "very great increase in a very few years" in the use of natural gas. It admitted, however, that "in the past two years...there has been a very great decrease in the use of natural gas by our iron and steel works." The paper placed the number of iron and steelworks using natural gas in March of 1892 at only 74. In Pittsburgh and Allegheny County the reduction in iron and steel works using natural gas was from 60 to 45 and elsewhere in Western Pennsylvania from 17 to 11. Natural gas use had been growing in central Indiana, but in all other areas of the country it had declined from 1890 to 1892. In general, the paper noted, bituminous coal had been substituted for natural gas but in some places petroleum or producer gas made from coal was used in conjunction with raw bituminous. A few other mills had moved from natural gas to primary reliance on petroleum or coal-based producer gas.\textsuperscript{198}

Natural gas had been tremendously desirable to Pittsburgh’s industries. Looking back at the period, one history of natural gas in the city claimed: “This was the time when natural gas was being acclaimed by industries as the one fuel...In iron and steel manufacture, Park Bros. and Company stated that their savings with gas were so great
they wouldn’t use coal as a gift.” Yet, Pittsburgh’s natural gas supply failed after eight years. Very little gas was actually to be found under the city of Pittsburgh itself. Natural gas prices had initially been very low and gas was sold on yearly contracts without measurement. In later years the gas was sold by the month according to the diameter of the outlet pipe installed by the consumer. Sources from the time and afterward point to tremendous waste. Natural gas pressure declined quickly and “knowing the original pressure, it was a simple calculation to show that a large percentage of the quantity of natural gas originally contained in the natural gas reservoir had been withdrawn and that something must be done to stop the waste.” Gas meters were introduced in 1890 and 1891, but they came too late to preserve the supply. Many companies failed and wells were exhausted. While some industrial use and much domestic use of natural gas continued, more and more homes and mills turned back to smoky bituminous coal.

2.11 Natural Gas Deconstructs the Mythology: an Odd Anti-Smoke Consensus

On February 7, 1892, as Pittburghers themselves were lamenting the return to coal, Harper’s Weekly ran an article on what natural gas had done for Pittsburgh. The article emphasized the enormous changes that fuel substitution had brought about for the city: “the difference between the old and new Pittsburg...the occasional visitor is at a loss to understand.” Like James Parton’s article, this one, written 24 years later, discussed Pittsburgh’s waning identity as a western city:

One may expect changes in the newer part of the West where towns and cities sometimes change with each phase of the moon or the real estate market, but in the East, which has had its character formed for a hundred years, a radical change
is something almost without parallel. Pittsburgh’s eastern neighbors are hardly to be blamed, therefore for some shadow of reluctance in grasping the full measure of her modern evolution.\textsuperscript{204}

Pittsburgh was no longer exactly Western since the Western cities were now the newer cities beyond the Appalachian frontier and even beyond the Ohio valley. Yet, Pittsburgh did not behave like a well-established Eastern city. Again, Pittsburgh was on the border: between East and West, between established historical character and unpredictable newness, no longer on the nation’s frontier, but still partaking in its unpredictability – even more so because, in its position between West and East, New and Old, one did not know whether change and dynamism were to be expected. The writer contrasted his impression of the “new Pittsburg” to his experience of the city on a previous visit. The writer first encountered Pittsburg, under its smoky visage, traveling down the Allegheny on a lumber raft:

...on the morning of the fourth day the raft passed from among the green hills and sloping banks, and made a landing at what seemed to be and probably was the smokiest, sootiest, dingiest spot on the North American continent... The buildings up and down the river were black and dirty beyond all hope of cleanliness, the bridges were grimy with soot and smoke, the steamboats went wheezing about as though choked with the smoke that rolled and drifted and surged as thick as a black fog. Smoke was everywhere. No crevice was small enough to keep it out, and no surface was smooth enough to refuse its layer of soot. The streets, the business blocks and even the private houses were unthinkably dirty and forbidding.\textsuperscript{205}

The writer’s impressions of the “New Pittsburg” were radically different:

...I again stood on the river bank, and looked out across the city of Pittsburg. It was the “Smoky City” no more. There was smoke here and there, but it was mostly from the steamboats on the river and the locomotives in the railway yards. The chimneys of the foundries and mills no longer gave forth great volumes of black smoke. The sun was shining clear and full in the city streets, and all about was the clean bright aspect of the average Eastern city.\textsuperscript{206}
The absence of smoke suddenly made Pittsburgh Eastern for this writer. Pittsburgh aspired to be an Eastern city while clinging to all that was best – growth, newness and unpredictability – in its Western heritage.

The writer, on this second visit, mistakenly inferred the absence of Pittsburgh’s characteristic industry from the absence of its characteristic smoke:

...it seemed to me that the mills were shut down and business closed; but I was assured by a Pittsburg friend, that the quiet looking city was doing more work, and incidentally making more money, than it ever had done before.207

To his surprise he found that natural gas had brought with it a growth of industry and the lack of smoke had inspired a civic and commercial boom:

The mills were running under high pressure, and the business streets were humming with traffic. Since my first visit many new buildings had been erected in all parts of the city and public improvements had been made that were a credit to the State. Everywhere about there was evidence of improvement and change.208

These changes reflected the diminution of the absolute environmental domination of the mills which made room for attention to commercial expansion and domestic comforts. “A peaceful revolution” was underway in the city:

This brightening of Pittsburg’s outward appearance and the quickening of her business life were brought about by natural gas. ...Steam users found that gas was a much better fuel than coal, and householders discovered, what the oil-region people had known for years, that gas is the ideal fuel for domestic purposes. A peaceful revolution took place in Pittsburg. The mills ceased to belch forth huge clouds of smoke, the merchant no longer looked upon soot as the chief enemy of the human race, and the careful housewife put gas burners into her coal stoves and took courage to clean house. Every one felt the beneficial change except the coal dealer. Householders brightened up the exteriors of their houses, new houses were built that had not even been contemplated before, and many improvements were projected that could not have been thought of in the old atmosphere of smoke and soot.209

In this passage, the writer took benefits to non-manufacturing commerce, benefits for domestic life, and benefits to the community to be of the same sort. Immediately after
discussing the civic improvements inspired by the reduction in smoke, the writer went on to discuss homes, neighborhoods and domestic life in the newly clean city. He accorded movement of residences out of the business section of the city an interpretation quite different from that offered by Parton in 1868. For the Harper’s writer, municipal services, legal incorporation, and convenient public transit connected the central business district to residential areas. For Parton, good public transit provided not connection but escape, and access not just to the hilltops surrounding the city but to havens from smoke “as much as twenty miles” away from the city. The Harper’s writer highlighted the links between riverside industry and hilltop residences, now pleasant places no longer right in line with the tops of smoke-stacks:

Home Pittsburg and working Pittsburg are two very different cities. The contrast never fails to surprise one when it is revealed. The visitor to the city sees along the river front an endless succession of mills and factories reddening the skies with their furnace glares. He lands in the business section – a limited area of bottom land...[i]t is a crowded, bustling place...this is the Pittsburgh that the casual visitor sees. But if he should take an electric or a cable car ride in the residence section how soon is the scene transformed! Soon he enters an undulating country, where are to be seen only lawns, gardens, cottages, villas, groves, meadows and parks. For miles around, the visitor sees what he will pronounce to be a beautiful suburban landscape. But this is Pittsburg, just as much so as the work-a-day section that is the Pittsburg of industrial renown. These embowered cottages are as completely city residences as if they were on Fifth Avenue. They have every usual city convenience, and in addition have the incomparable facility of fuel gas.210

The article tied the improvements in environment and domestic life to Pittsburgh’s population growth -- a measure of its success as a city:

People who had business in Pittsburg, but were unwilling to live there, soon moved into the city, and others who wanted both business and homes in Pittsburg had no excuse for remaining away. The population increased at a remarkable rate....What had been 156,389 in 1880 became 238,473 in 1890...Here is a gain in population of 82, 084 in ten years. Most of that gain has been made within the
past five years, or since the introduction of natural gas, which indicates in a measure what might have been had soft coal smoke clouded her progress.211

Again the article compared Pittsburgh to the newer cities of the West, allowing its status as a boomtown surpassing Western boomtowns to overshadow its decline as a Western gateway: “Hardly any boom city of the new West could show such progress.” Although the article called Pittsburgh “above all a manufacturing city,” it quickly pointed out that: “the annual statistics and reports of her...Chamber of Commerce show that she takes a high rank as wholesale trader.” It went on to say: “One would think that it would be enough for any city to be the largest iron and steel producer in the country, but Pittsburgh is always on the watch for new things that will in any way add to her prosperity and her population.”212

George Thurston had similarly connected increased trade with natural gas. Although he claimed in the introduction to his 1886 survey that retail trade was proportional only to population and so not interesting to outsiders,213 in his chapter on “Mercantile Interests” he quoted a Chicago newspaper, the Bureau, as characterizing Pittsburg as having neglected “Commercial interest while securing the supremacy of manufactures.” Thurston had said as much himself in his 1876 book.214 According to Thurston, Pittsburgh had made improvements in this respect between 1876 and 1886 and natural gas was a major reason:

The average man has always a disposition to seek a large city for mercantile transactions. The new dress, so to speak, that Pittsburgh is putting on under the use of gas fuel is also having its influence in rendering the city a more attractive market in dry goods, millinery goods, boots and shoes, jewelry, etc. That Pittsburgh is growing in its mercantile interest as well as it manufacturing, one is made aware of by that peculiar evolution in trade that always accompanies mercantile growth, before mentioned in some other divisions of business in the city, that is the segregation into distinct classes by each character of mercantile
interest....There can be no doubt that to some extent the old-time smoke and soot had a depressing effect on the trade in many articles as it had on the acclimation here of many kinds of manufactures. That is of the past and also a certain lethargy as to the extension of mercantile interests.215

Pittsburgh’s accelerated population growth would help this trade to grow.216 Despite his protestations in the introduction, Thurston in this passage, does appear to take seriously branches of business that grow only in proportion to a city’s own population. In this way he departed from Pittsburgh’s longstanding emphasis on extrinsic valuation. The 1892 Harper’s article suggested the same reorientation. Economic value in Pittsburgh could now be measured, in part, by her own population’s appetite for consumer goods. Thurston, within the space of one book, appeared to be caught between Pittsburgh’s old values and its new ones.

Both consumer goods and real estate took on greater value in the city with the repeal of smoke’s “sumptuary law.” The Harper’s feature concluded by remarking on the health of the Pittsburgh real estate market and the recent architectural achievements of the city. Again, unlike Parton’s piece, it linked rather than opposed urban and suburban growth:

The advancement of the city in a material way is clearly shown by the permits taken out at the Building Inspector’s office which average several millions of dollars and which is an excellent record for a city of this size. The suburban growth has also been rapid of late years, owing to the improved facilities for rapid transit. The building outlook is said to be very bright which may be taken as an indication of the prosperous condition of other branches of business. Taking into consideration all of Pittsburgh’s present circumstances the impression of an impartial observer must acknowledge that the city has good reason to be satisfied with her condition and hopeful for the future.217

Little did the Harper’s writer know that Pittsburgh’s descending “black cloud curtain” had already obscured many of the improvements witnessed a short time before. As the
natural gas supply dwindled, both industrial workers and the business and manufacturing classes lamented the return of smoky skies. Workers and manufacturers agreed that gas made better iron and steel than coal. By 1892 freedom from smoke and soot was no longer a prerogative of spoiled elite country gentlemen who had no necessity of procuring “sustenance,” as it had been in Huckenstine’s appeal. For workers and employers the cleanliness associated with natural gas, freedom from smoke and soot, had become a value of production. Yet, the changes wrought in the city during the natural gas period cut across categories of consumption and production, luxury and industry. During the natural gas period a central business district was able to develop in the old city, based on elite investment in downtown real estate. Clearer skies in combination with the suburbanization of industry and residential flight from downtown wards created this opportunity.

Changes in culture and ideology also made building a central business district an opportunity that elites would accept. By the 1880s, some voices even within Presbyterianism, the religion of Pittsburgh’s founding families, promoted leisure. In addition, by the 1890s Pittsburgh was no longer dominated by working class culture: Pittsburgh’s businessmen and industrialists, spurred particularly by their wives and daughters, had developed a strong culture of their own with links to a national elite culture. These links to national culture undermined Pittsburgh’s claim to frontier exceptionalism and put the city more clearly under the jurisdiction of widely held urban values. Since suburbanization of both elite residence and industry had occurred during the less smoky period, it was only with the return of smoke that elites realized that they could not isolate themselves from “urban” environmental problems by escaping to the
suburbs. Elite residential and newly smoky industrial neighborhoods often stood side by side.

It was not only Pittsburgh’s elites that resisted the return to smoke. The NLT was sure that the city as a whole -- or at least its “progressive” elements – shared its opposition to smoke, and as Pittsburgh burned more and more bituminous, the pace of the NLT’s smoke consumption editorializing quickened. On December 20, 1890 the paper first called for the adoption and enforcement of a smoke-abatement ordinance. For the NLT by 1892, smoke was “an emergency” and the question of smoke abatement a matter of “great moment.” On December 26, 1892, the NLT ran a front page editorial on smoke entitled “Consume It, Of Course.” The paper urged the newspapers of Pittsburgh to “tackle seriously the subject of smoke consumption.” It argued that since mills now produced triple the output they had before natural gas had been adopted, the return to coal would cause a two hundred percent increase in smoke over pre-natural-gas emissions. For the NLT this level of smoke would be “unbearable.” Smoke would “smut everything of a material sort, and kill foliage” and “would render necessary something in the nature of a chimney sweeping for nostrils, throat and lungs.” The paper suggested that the “city government...set an example by consuming the smoke of its water works stations” as a test of available smoke consuming technology. This was to be followed by a “formal inquiry” on the smoke abatement progress of other cites to be conducted by the city’s newspapers. Once the newspapers had “in this way determined the practicability of smoke consumption and the merits of devices in practice” the next step would be the passage and enforcement an ordinance “drawn judiciously to meet the smoke emergency and regardless of the old fogyish that would convert Pittsburgh into a constant condition
of London fog rather than move along with the progress of the times.” Smoke was a serious issue for the NLT: the problem had moved beyond the level of “nuisance” and become “unbearable.” The paper demanded, but did not take, action. Although Pittsburgh workers had organized and lobbied city councils to improve the natural gas supply by allowing competition into the industry, there is no evidence that Pittsburgh workers organized a political campaign against smoke itself.

2.12 Experiments With and Rejection of Manufactured Gas

Given the universal appreciation of the cleanliness of natural gas and the acknowledgment at the 1881 Engineers’ Society of some of the benefits of manufactured gas, it seems surprising that Pittsburgh did not build a coal-based manufactured gas industry when the local natural gas supply failed. Many Pittsburghers at various points during the natural gas period had contemplated this outcome. George Thurston initially predicted that a new manufactured gas and by-products industry would prevent the threatened “decadence of the coal trade” by providing an outlet for the coal displaced by the adoption of natural gas. Like the NLT Thurston was adamant in his contention that a return to industrial use of raw bituminous would be a “retrograde” motion: “Should it [the natural gas supply] fail neither the people of Pittsburgh or of other localities where it has been utilized could or will go back to the crude fuel of coal...” Gaseous fuel, whether natural or artificial, was superior to all others for industrial use:

the superiority of gas over any other fuel for manufacturing necessitates its consumption in all competitive manufactories and precludes any return to crude coal heat where gas can be had in the future. Ignoring the question of the cheapness of gas over coal where the consumption is made at or in the near adjacencies to the well, the other advantages of gas fuel...would enforce its use
under a similarity of cost...whether of nature’s production or from artificial supply...226

Since Pittsburgh had shown the world the incomparable benefits of gaseous fuel, industries in other locations not near supplies of natural gas would want to switch from coal to manufactured gas. Pittsburgh would benefit from this circumstance because Pittsburgh coal was the best in the world, according to Thurston, for the production of manufactured gas.227 This new local industry would add to Pittsburgh’s wealth and support its coal industry if the natural gas supply persisted and it would rescue Pittsburgh’s industry in multiple ways should the local natural gas supply fail.228 The profitability of this new industry, however, depended on the difficulties of pumping gas over long distances.229 Thurston referred to coal as “tanked gas”230 and contended that while it was “practically impossible to transport natural gas long distances without such cost as forbids its use but gas tanked in coal ...will bear even railroad carriage into the interior”231

Westinghouse himself, as of 1888 had been experimenting with a new process of manufacturing gas from both anthracite and bituminous coal at a low cost. Artificial gas produced by this new process could be locally distributed using new technology developed for the distribution of natural gas in Pittsburgh.232 Pittsburgh would in this way too, even if the natural gas supply were exhausted, owe its position in a new manufactured gas industry and in “a progressive revolution in manufacturing fuels of the world” to its experiments with natural gas.233

Manufactured gas carried with it one industrial possibility even beyond that offered by natural gas. Thurston looked toward the development in Pittsburgh of a coal-
based synthetic chemicals industry in which the chemical by-products created during the
combined process of coke and manufactured gas making could be collected and sold.
Pittsburgh, even in the late 1880s had a coke-based chemical industry that might have
made adoption of manufactured gas more profitable.234 Thurston pointed to the profits
made from by-product coking in English plants. He argued that given the huge magnitude
of the local coke industry “the by-products of coal present the possibility of as great a
chemical reputation for Pittsburgh as in either iron, steel or glass.”235

Several other writers predicted the development of a manufactured gas industry in
Pittsburgh, should the natural gas supply fail. In 1889 the Pittsburgh and Allegheny
Illustrated Review concurred with Thurston in all respects:

Perhaps one of the most useful effects of the introduction of natural gas...is the
discussion which it has evoked in regards to the future of the fuel problem. The
advantages of gas are manifested in so many ways that it is a generally expressed
opinion that if the supply of natural gas should become exhausted, the industries
which have employed it in their operations would not go back to coal fuel, with
all of its drawbacks. But would have recourse to some of the numerous cheap and
effective processes for the manufacture of artificial gas which are being perfected
apart from any possibility of a diminution of the gas supply, there are many
regions in which natural gas is not obtainable and the communities affected are
already looking to new gas processes as a probable and important aid to
manufacturing operations. The introduction of these processes would have no
injurious effect on the coal trade, as no method of producing gas can be devised
into which bituminous gas coal will not largely enter. This is a new field of
enterprise and its possibilities must enter largely into all intelligent speculation as
to the industrial future of American cities.236

Manufactured gas did not replace natural gas despite optimistic predictions.
Chronicles from the period pointed to cost as a decisive factor. An 1889 city history
viewed the city’s fuel dilemma as a vital issue. It reported that a company in Philadelphia
had succeeded in producing artificial gas at less than ten cents per thousand feet. It
claimed that if such a cost had been achieved “the substitute for the natural article has
already been found.”237 Later sources claimed that no process for artificial gas production that could make it competitive with local bituminous coal was ever developed.

Developing a satisfactory artificial substitute was an uphill battle from the start: natural gas has a higher heat value per unit volume than manufactured gas238 – manufactured gas furnishes only ½ the heat value of natural gas.239

The years1885 through 1888 had been the peak of natural gas usage in Pittsburgh. By 1895 consumption of natural gas in Pennsylvania (concentrated mostly in the Pittsburgh region) was 1/3 in monetary value and less than this in quantity, of what it had been in1888. As supply declined, price increased. J. M. Kelly in his Handbook of Greater Pittsburgh (1895) described a relationship between natural gas prices and manufactured gas availability:

Prices of gas have been advanced as the production decreased until to-day producer gas can be made from coal and supplied to manufacturing plants cheaper than natural gas can be furnished. This condition of affairs led to a change of policy by the gas companies, who discouraged the use of gas for manufacturing and turned to the dwelling as their most profitable source of supply. Yet this condition by no means indicates that natural gas has lost its value, as compared with coal, as a fuel. It makes a better product, is smokeless, and is less expensive in labor required. The continued decrease in production however has impelled the large gas companies to provide for the use of manufactured gas in the future. The millions of dollars in pipe underground cannot be abandoned and will be utilized for all time. The Philadelphia Company, the largest producer has bought Brunet’s Island, in the Ohio river, containing 185 acres and valued at 284,401 which it proposes to utilize as a great gas manufacturing plant. Plans have been prepared and the product will be used with natural gas within a year or two.240

Manufactured gas was at this point cheaper than natural gas but still more expensive than coal for industrial users. Local industries had taken initial steps to fulfil the predictions made by Thurston and others in the immediate aftermath of the natural gas period. By 1891 significant manufactured gas experiments were underway in
Pittsburgh, but they were accompanied by as much disappointment as hope. In early May the Pittsburgh Gas Company was eager to establish a domestic manufactured gas business in connection with Siemens-invented gas producers that could serve as a domestic heating stoves. Later that month a committee from Milwaukee visited Pittsburgh to learn about an experimental manufactured gas works erected by George Westinghouse. Yet, they were informed on their arrival that Westinghouse had given up hope “of ever perfecting a gas to take the place of natural gas” and had ordered that “all the experimental gas plants...be dismantled and sold because he could accomplish nothing by continuing the experiment.”

Nonetheless, some mills were still exploring such options. By the end of May, Carnegie’s mills were conducting a decisive experiment to determine whether they would use coal or an alternative fuel – manufactured gas or oil – in their puddling furnaces. Carnegie Mills’ management had been “experimenting with various fuels” since the natural gas supply had weakened. On the previous Friday they had put two puddling furnaces into operation with coal. These furnaces had been designed by (city councilman and future smoke ordinance opponent) Hugh Ferguson, in conjunction with the plant manager a Mr. Borntrager. The new furnaces were arranged so that they could be converted from coal to gas in about an hour. In the past it had been necessary to “construct almost entire new furnaces” whenever fluctuations in the gas supply made it necessary to change fuels. After “keeping a strict account of the coal consumed and the labor of firing” in the two experimental furnaces, Borntrager would be able to determine exactly the cost difference between coal and gas puddling. Other area mills awaited the results of the Carnegie mills’ experiments.
Hopes for manufactured gas were turning away from coal and to petroleum. In another fuel change experiment, in late May 1891, the Phillips Glass Company was set to give up use of natural gas in favor a kind of manufactured gas based on “Lima oil.” This South Side company was erecting a “mammoth” gas works since they had lost much time and money to the fluctuating natural gas supply. The Lima oil process, however, was not to be preferred to coal for environmental reasons. Lima Oil gave off such “disagreeable odors” that the company had to arrange for the “noxious fumes to be carried off through the high stack.” This effort, like that at Carnegie Mills, was being watched by other manufacturers eager to implement similar systems if this one were shown to be successful.244

As early as April 1892, the Pittsburg Press had reported on the failure of large scale manufactured gas experiments undertaken by the Philadelphia Company. While the company’s annual report asserted that manufactured gas would take over where natural gas had failed, the paper said to take this with “a large impregnation of chloride of sodium.” The Press reviewed the history of failed manufactured gas experiments in Pittsburgh: Switch and Signal and the Philadelphia Company had both lost money on them. Philadelphia Company president George Browne said himself that “fuel gas has not yet been discovered which can be produced at anything approaching the price of natural gas.” All coal-based manufactured-gas processes had been “pronounced rank humbugs by all competent judges.” The article claimed that attempts at gas production from oil, like the one described above were scarcely better. Even if technical difficulties could be worked out, the price could not be regarded as stable enough to justify investment in
production, since Standard Oil did not offer contracts of more than six months duration.245

In 1894, despite these earlier discouragements, the Philadelphia Company, still the city’s largest natural gas supplier, purchased Brunet’s Island (in the middle of the Ohio River) on which it planned to build a manufactured gas plant. Yet, by 1908, although the Philadelphia Company produced and distributed artificial gas for lighting, it had used the Brunet’s Island land to build “[a]t a cost of over $2,000,000...the largest electrical power-house between New York and Chicago.” The company had also supplemented its energy business through expansion into street railways such that: “Rapid transit in Pittsburgh is entirely under the control of the Philadelphia Company.”246

The continued profitability of the company’s natural gas business itself provided another disincentive for the development of a manufactured gas plant on Brunet’s Island: in 1894 the Philadelphia Company had 15,000 natural gas customers but by 1926 it would have 169,000.247 In addition, the discovery of large gas fields in other parts of the country and the development compression technology for the piping of natural gas over long distances eliminated the need to use the Brunet’s island facility for the production of manufactured gas to meet Pittsburgh’s gas fuel demands.248

Although by-product coke production was possible in the nineteenth century, the proximity of a well-developed beehive coking industry in nearby Connellsville provided a disincentive for its development in Pittsburgh. In addition, iron and steel makers in Pittsburgh “were for years of the opinion that the by-product oven would not make coke from these coals as suitable for blast furnaces as that produced in the beehive oven.”249 The dual purpose industry of producing coke and using the waste gas as a manufactured
gas fuel was not seen as profitable until the opening of the market for by-product chemicals created by the interruption of commerce with the German chemicals industry in World War I.

With the failure rapidly to develop a new manufactured gas industry, bituminous coal again became Pittsburgh’s major industrial fuel. Due to increases in industrial production, population and the building of taller multi-story buildings (reliant on steam driven elevators) during the downtown building boom, smoke levels at the end of the natural gas period were likely much higher than those before it began. Between 1895 and 1900 smoky days per year reported in the U.S. Weather Bureau journals varied widely – between 2 and the low 80s – representing, overall, a sharp increase over smoky days reported during the natural gas period. In addition, the shift to steel in combination with the adoption of natural gas, fueled an overall production boom which increased post-natural-gas smoke levels. New downtown real estate interests were threatened by the return of smoke. Elites now openly interested in the consumption-related economic goods connected to real estate had reason to lament the return of smoke.

2.13 Conclusion

As we have seen, between the 1860s and the early 1890s, Pittsburgh’s relationship with smoke was transformed materially, economically and ideologically. Smoke was less tolerated and no longer emblematic of the city’s identity by the 1890s. In the 1870s “that single word” “smoke” had summed up Pittsburgh’s civic identity. Smoke represented industrial productivity and industry as a human (masculine) virtue, linked with the eschewal of feminized luxury. Smoke enforced class harmony since by sullying material
goods it made conspicuous consumption, a marker of class difference, impossible, and because it embodied the industriousness that would prevent the development of workers’ resistance born of idleness. This class harmony was compatible with the dominance in Pittsburgh of republican working class culture and with the weakness and parochiality of religiously constrained local elite culture. Yet, as early as the 1860s class harmony and egalitarian republicanism were clearly weakening as was evident in the increase in confrontational labor disputes and in the movement of elite citizens to less smoky suburbs.

With increasing residential segregation the dominance of Pittsburgh’s working class culture over the culture of the city as a whole waned. Elites, now locally segregated, abandoned some of their provinciality and forged links with a national elite culture. With the suburbanization of industry, elite population and the workers who followed the mills to the suburbs, downtown space was made available for the development of a central business district. By the 1880s, real estate interests reinforced a rising interest in domesticity and consumption rather than in production alone.

Changes in the municipal agenda reflected these new cultural values. The city developed a permanent public health department, and made efforts to regulate or provide water supply, sewerage, garbage disposal and street-cleaning. By the 1880s and 1890s, the working class too began to emphasize domestic life and became interested in environmental conditions and amenities. Eventually, beliefs about municipal responsibility for the environment and working class demands for a decent standard of living would all be brought to bear on smoke.
As Pittsburghers came to expect environmental amenities, aggressively deployed technological changes uncoupled Pittsburgh’s commitment to industry from particular products (iron rather than steel), production processes (puddling rather than the Bessemer process) and particular fuels (bituminous coal rather than natural gas). Rapid technological change in key industries removed the moral meaning of particular production techniques and materials. Smoke no longer simply meant industry since steel production was less smoky than iron-making and natural gas was clean relative to coal.

The use of natural gas between 1884 and 1892 allowed Pittsburghers to see how much their material lives had been shaped by smoke. It broke down the necessary connection between smoke and industry. It also fueled the expansion of aesthetic, domestic, and consumption interests in the city just as elite leisure culture in the city expanded and grew less parochial and as downtown real estate and retail boomed. These factors weakened Pittsburgh’s interest in claiming exemption from widely held civic ideals based on frontier exceptionalism.

As interest in consumption values increased, the distinction between consumption and production values was blurred because of natural gas’s good effects on product quality, working conditions, and the external environment. By 1881, at the beginning of this period of change, Pittsburgh industrialists and engineers had already talked about smoke in a new way. Iron and steel masters were interested in new technology as a means of cutting costs, reducing labor problems (both by eliminating workers and by making existing workers happier) and increasing quality and efficiency in the mills. Workers themselves feared but then embraced natural gas. The NLT’s interest in technology – manufactured gas, coal by-product collection and natural gas – was evident. The use of
new technologies in the mills and the positive impression they made on workers broke
connections between dirty work and manly virtue. The NLT politicized both domestic
and mill conditions. Workers strongly resisted the return to coal and smoke and
connected smoke abatement with economy, science and modernity. They linked the
quality of product, quality of working conditions and quality of the external environment.
Natural gas also contributed so significantly to the expansion of industry and construction
that post natural gas smoke levels were expected to be much higher than those before
1884 and there was even concern about whether Pittsburgh’s rail capacity would be
adequate to transport the coal required to replace the natural gas. By the time of industrial
return to bituminous coal in 1892, these many interdependent factors supported one
another, to so that disparate constituencies in civic life would unite in their opposition to
“going back to the smoke.”

Notes

1. Glenn Britton has examined the changing meaning of smoke in Pittsburgh’s history in “Boosters and
Kickers: Allegheny Smoke and Defining the Public Good” (paper presented at the annual meeting of the
Eastern Historical Geography Association, Pittsburgh, Pa., 25-28 September 1997). Britton discusses the
rhetoric of the judicial opinion in Huckenstine’s appeal and emphasizes the decision’s novelty and its role
in singling out Pittsburgh, and more generally Pennsylvania, as a place where conditions such as those
imposed on Huckenstine’s neighbors could not amount to a nuisance.


3. Christine Rosen chronicles the tendency of Pennsylvania judges before the mid-1860s to give “great
weight to the value of alleviating the human discomfort caused by pollution” in the “traditional mode of
balancing reasoning” which was replaced by a new one after the mid-1860s in which “they confined
themselves to assessing the value of alleviating pecuniary damages to property.” New York and New
Jersey judges would not make the same transition until near the turn of the century. (Christine Rosen,
“Differing Perceptions of the Value of Pollution Abatement across Time and Place: Balancing Doctrine in

4. Huckenstine’s Appeal, 70 Pa. 102, 1872 Pa. (Supreme Court of Pennsylvania, argued November 6,
1871, decided January 9, 1872).

5. Huckenstine’s Appeal.


11. Ralph Keeler and Harry Fenn, “The Taking of Pittsburgh,” Every Saturday (March 25, 1871): 274. (Four-part article published on March 4, 11, 18, and 25, 1871.)


19. McKnight, Old Fort Duquesne, 10.


23. George H. Thurston, Pittsburgh As It Is: Facts and Figures, Exhibiting the Past and Present of Pittsburgh, Its Advantages, Resources, Manufactures and Commerce (Pittsburgh: S. Haven, Book and Job Printer, 1857); George H. Thurston, Pittsburgh and Allegheny in the Centennial Year, (Pittsburgh: A. A. Anderson and Son, 1876); George H. Thurston, Pittsburgh’s Progress: Industries and Resources (Pittsburgh: A. A. Anderson and Son, 1886); George H. Thurston, Allegheny County’s Hundred Years (Pittsburgh: A. A. Anderson and Son, 1888.); David Lowry Pittsburgh: Its Industry and Commerce (Pittsburgh: Barr and Meyers, 1870).


27. Richard Realf (1834-1878) was a poet and a journalist. He was also an abolitionist and temperance advocate, charged with treason in connection with John Brown’s raid at Harpers’ Ferry but the charge was later dismissed by Senate investigators. He worked for the Pittsburgh Commercial from the mid 1860s until 1876 and in 1877 began a career as a lecturer. He committed suicide in 1878. Frank W. Blackmar, Kansas; a Cyclopedia of State History (Chicago: Standard Publishing Co.: 1912) vol. 2, 552-3; Smith, Memory’s Milestones, 79-80.


32. Thurston, Pittsburgh As It Is, 169-71.


35. Census statistics from http://digital.library.pitt.edu:

<table>
<thead>
<tr>
<th>Year</th>
<th>Pittsburgh Population</th>
<th>Allegheny City Population</th>
<th>Allegheny Co. Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1850</td>
<td>46,601</td>
<td>21,262</td>
<td>138,290</td>
</tr>
<tr>
<td>1860</td>
<td>49,221</td>
<td>28,702</td>
<td>178,031</td>
</tr>
<tr>
<td>1870</td>
<td>86,076</td>
<td>51,180</td>
<td>262,204</td>
</tr>
<tr>
<td>1880</td>
<td>156,389</td>
<td>78,682</td>
<td>355,869</td>
</tr>
<tr>
<td>1890</td>
<td>238,617</td>
<td>105,287</td>
<td>551,959</td>
</tr>
<tr>
<td>1900</td>
<td>321,616</td>
<td>129,896</td>
<td>775,058</td>
</tr>
</tbody>
</table>

Chemical engineer Cliff Davidson has attempted to estimate historic smoke levels in the city. For the period covered by this chapter Davidson used methods that do not depend on problematic estimates of the area subject to pollution, as his estimates for earlier periods did. These statistics are based on Davidson’s graph of rising and falling numbers of Pittsburgh’s smoky days by year.

For the years 1845 to 1865 drew his data from the personal diary of George Albree, weather correspondent for the Pittsburgh Dispatch.
Year | Smoky Days – Albree’s Weather Diary
--- | ---
1845-50 | varies from 5 to 10
1850-55 | varies from 5 to 11
1855-60 | varies from 5 to 19
1860-65 | varies from 17 to 30

For the years 1865 to 1885 Davidson drew his data from the Weather Observer Journals of the United States Army Signal Service.

Year | Smoky Days – Army Signal Service
--- | ---
1865-70 | varies from 17 to 27
1870-75 | varies from 17 to 55
1875-80 | varies from 1 to 37
1880-85 | varies from 0 to 27 (varies from 0 to 1 except for 1885 spike at 27)

For the years 1885 to 1905 Davidson drew his data from Weather Observer Journals of the United States Department of Agriculture.

Year | Smoky Days – U.S. Weather Bureau
--- | ---
1885-90 | varies from 0 to 2 (varies from 0 to 2 except for 1885 spike at 27)
1890-95 | varies from 0 to 10
1895-1900 | varies from 2 to 84
1900-1905 | varies from 65 to 84

Although weather observations leave a great deal to the discretion of the observer, they can, when examined alongside other sources, furnish a rough guide to changing smoke levels. It is also helpful to compare weather observations from the same source, gathered by the same method with one another. Cliff I. Davidson, “Air Pollution in Pittsburgh: A Historical Perspective,” *American Pollution Control Association Journal*, 29 no.10, 1035-1041.


40. The seriousness of the depression in Pittsburgh is evident from changing smoke observations: according to Albree’s diary, smoky days dropped off between 1875 and 1880 to between 1 and 37 per year.


61. This increase is due, in part, to the 1868 annexation which increased the area of the city by a factor of 10. However, many rural districts with low population were included in the territories annexed. Most of the increase was due to immigration rather than territorial expansion.

63. Thurston, *Pittsburgh As It Is*, 204.

64. Keeler and Fenn, “The Taking of Pittsburgh” (March 11, 1871): 238.


69. This tension is perhaps best captured in an image put forward not by Parton, but by Keeler and Fenn. To express the coexistence of civilized culture and industry Fenn sketched “The Burning Spire” – “One of the tallest of the many church steeples rises from the dark plain below and stands out before the glow of a distant furnace in such a way as to seem on fire. In one position nothing of this furnace can be seen but the immense blaze, and that, though a mile away, envelops the nearer spire in flame – or rather seems to do so. There could not be a more beautiful or striking illusion.” Keeler and Fenn, “The Taking of Pittsburgh” (March 25, 1871): 274.


78. Thurston, *Pittsburgh and Allegheny in the Centennial Year*, 11; *Pittsburgh’s Progress*, 4. Thurston’s later books did not cite the “progressional ratio.” By 1876 Thurston saw Pittsburgh instead as “a great city...standing midway between an empire of population on the east and an empire of population on the west.” He repeated this characterization in his 1886 volume.

79.Journalists Keeler and Fenn (1871) automatically counted Pittsburgh among “ambitious Western cities” and characterized it as part of the “fun-loving West.” Keeler and Fenn, “The Taking of Pittsburgh” (March 25, 1871): 274.


81. Montgomery uses Parton’s description of rollers and puddlers pausing to pour perspiration from their boots to illustrate that Pittsburgh’s “aristocracy of labor” worked very hard despite union work rules that limited the number of furnace charges per day. (Montgomery, *Fall of the House of Labor*, 18.) Francis
Couvares begins the introduction to Remaking Pittsburgh with a quotation from Parton that he takes to illustrate Pittsburgh’s place as a “...preeminent and exemplary...site of industrialization in America, indeed, in the world.” He also uses Parton’s description of working class social life on a Saturday afternoon to bolster his contention that leisure culture in Pittsburgh was shaped primarily by working class sensibilities. In addition, he contrasts the development of a “sense of civic duty” among “Pittsburgh capitalists” in the 1890s with that which “James Parton had found lacking in their [1860s] predecessors.” (Couvares, The Remaking of Pittsburgh, 1, 37, 95.) Neither of these historians makes use of Parton’s discussions of Pittsburgh’s smoke and their relationship to his views – and to larger cultural views – of other aspects of Pittsburgh’s identity and social transformation.

82. Thurston, Pittsburgh As It Is, 37.
83. Thurston, Pittsburgh As It Is, 37.
84. Thurston, Pittsburgh As It Is, 37.
90. Thurston, Pittsburgh As It Is, 49.
91. “American Iron and Steel,” 49.
95. Müller, “The City of Pittsburgh,” 64.


106. Yet, if one goes further into Parton’s discussion, it is easy to see that Parton did see class as imposing differential social obligations toward the city itself. When Pittsburgh capitalists amassed their fortunes, they incurred social obligations to the city as a whole. The capitalists found that “a GREAT CITY [was] upon their hands, to be consolidated, organized, paved, policed, parked, purified and adorned,” but they could not break their habits of industry for long enough to meet the civic obligations that their wealth imposed. Parton saw such civic betterment, however, as a retirement activity for overworked capitalists, essentially then, a leisure activity imposed by accession to a higher class. (Parton, “Pittsburg,” 32-3.)


111. Glazier, Peculiarities of American Cities, 343.


117. Thurston, Pittsburgh As It Is, 42.


119. The claim that Pittsburgh physicians believed that smoke was healthful began with Thurston in 1857. Thurston had quoted a local physician who claimed coal was antimiasmatic and that its “abundance cheapness and consequent general use by the poorest inhabitants [was] undoubtedly a great cause of [Pittsburgh’s] superior healthfulness.” Low fevers common in large cities and ague and fevers in the east where wood was scarce were “in a measure prevented by the universal practice of keeping good coal fires late in the spring and early in the autumn...” Thurston claimed Pittsburgh was the healthiest city in the United states if not the world with a 1 in 99 death rate as an average of the past 5 years while other cities ranged from Buffalo at 1 in 56 to Edinburgh at 1 in 22. Thurston, Pittsburgh As It Is, 42-4. Like Parton, Keeler and Fenn and Glazier were driven to report this surprising fact. (Keeler and Fenn, “The Taking of Pittsburgh” (March 11, 1871): 238; Glazier, Peculiarities of American Cities, 334.) Only Parton suggested an inconsistency between this claim and emerging residential patterns in the city. (Parton, “Pittsburg,” 20.)

120. Pittsburgh (Pa.) Board of Health, Annual Report of the Board of Health of the City of Pittsburgh for the Year 1873 (Moore and Nesbit: Pittsburgh, 1874): 84-5. Peter Thorshiem has discussed early ideas about smoke and health in “Miasma, Smoke and Germs: Air Pollution and Health in Nineteenth Century Britain” presented at the annual meeting of the American Society for Environmental History, Baltimore, MD, 6 March 1997 and in “Circulation, Sunlight and Ozone: Air Pollution and Science in Late Nineteenth Century Britain” presented at the Symposium on the Industrial Environment at the XXth International
Suburbs had better access to public utilities since city services went to those who could pay. The twelve hour day and the long turn kept poor families close to the mills. Working class women's housework burden remained heavy because of increased crowding and over-taxing of inadequate municipal services in poor neighborhoods. In 1879, Pittsburgh public works officials remarked that rising standards of cleanliness among the middle class took water from the poor. Kleinberg, The Shadow of the Mills, 88-89, 303-9.


Couvares, The Remaking of Pittsburgh, 57-61.

Couvares, The Remaking of Pittsburgh, 57-8.

Thurston, Pittsburgh and Allegheny in the Centennial Year, 112-113, 132, 192, 196.

as well as engineers and smaller mill-owners.


Thurston, Pittsburgh and Allegheny in the Centennial Year, 22-23.

Thurston, Allegheny County’s Hundred Years, 207.

Thurston, Allegheny County’s Hundred Years, 207.

Thurston, Allegheny County’s Hundred Years, 207.

Thurston, Allegheny County’s Hundred Years, 207.

Thurston, Pittsburgh and Allegheny in the Centennial Year, 22-23.

Thurston, Pittsburgh and Allegheny in the Centennial Year, 22-23.

Thurston, Pittsburgh and Allegheny in the Centennial Year, 22-23.

Thurston, Pittsburgh’s Progress, 16.

Thurston, Pittsburgh and Allegheny in the Centennial Year, 22-23.


Thurston, Pittsburgh’s Progress, 13.
142. Thurston, *Allegheny County’s Hundred Years*, 205.

143. Thurston, *Allegheny County's Hundred Years*, 205.


146. Thurston, *Pittsburgh and Allegheny in the Centennial Year*, 22-23.


150. The *NLT* provides the closest chronicle of fuel transitions in this period. It published over fifty articles between 1888 and 1893 on the prospects for Pittsburgh’s natural gas supply and on possible substitutions of cleaner fuels for coal. See “Natural Gas,” *NLT*, March 5, 1892, for a retrospective summary of natural gas use in Pittsburgh’s mills.

151. Beginning in 1885/7 Davidson made his calculations based on yet another source: the weather observer journals of the Weather Bureau of the United States Department of Agriculture which recorded the presence of smoke by day (and up until 1893 did so without recording whether smoke was light, heavy or moderate). See smoky day chart in note above.


162. [Cushing et al.], *History of Allegheny County*, 616.

163. [Cushing et al.], *History of Allegheny County*, 616.
164. [Cushing et al.], History of Allegheny County, 620.

165. Paul Krause calls the National Labor Tribune “the voice of the Pittsburgh labor movement” but contrasts its conservatism, especially from the 1880s on, with the more radical resistance embodied in the workers’ community at Homestead and the Homestead Strike (1892) itself. Krause, The Battle for Homestead 7.


167. “Natural Gas,” NLT, June 21, 1884.


170. In Beauty Health and Permanence Samuel and Barbara Hays introduce the distinction between consumption and production values. They argue that the late twentieth century environmental movement was rooted in the later. Production values are associated with the acquisition of necessities and consumption values with the desire for non-essential amenities. Hays, Beauty, Health and Permanence.


172. NLT, January 28, 1888.

173. “Street Opening and Natural Gas,” NLT, November 14, 1885; “The Gas Famine,” NLT, December 12, 1885 (reprinted from the Pittsburgh Penny Press); NLT, January 28, 1888.


176. “Coke Oven Gas,” NLT, January 3, 1891.

   The NLT was, in addition, confident that “there will never be a return to the old style extravagant consumption of coal.” (“Coal and Gas,” NLT, November 6, 1886.)


177. Writers gloried in the “wonderful things,” from benzol to saccharine produced in coal gas manufacture. (“A Lump of Coal: The Wonderful Things Produced from out Bituminous Coal,” NLT, November 20, 1886; “Some Uses of Coal: A Chemist Gives Some Interesting Points About Extracts of Bituminous,” NLT, October 16, 1887; “The Beauties of Coal,” NLT, October 22, 1887; “The By-Products of Coal,” NLT, October 26, 1889.) The NLT celebrated European experiments with by-product coking but lamented that in Pittsburgh these chemicals went “up in smoke” and were a “dead loss.” (“Coke and Smoke,” NLT, August 31, 1889; “Coke Oven Gas,” NLT January 3, 1891.)

178. NLT, December 20, 1890; “The Commercial Value of Smoke,” NLT, June 6, 1891.

179. As the paper celebrated coal by-products, it lamented that their discovery had not improved miners’ wages. (“The Beauties of Coal,” NLT, October 22, 1887.) It also offered detailed criticisms of how various fuel technologies shaped the experience of workers. Even after it had embraced the production benefits of natural gas, it was harshly critical of the demands unsteady supply imposed on puddlers. The NLT even criticized the technology it took as the best natural gas alternative available: manufactured gas, examining strengths and weaknesses of each type of gas and complaining that the “performance” of many gas-making processes “hardly justifie[d] the claims made for them.” (“Fuel Gases: A Few Points on the Fuel That Displaces Crude Coal and Which Will in Turn Give Way to Electricity,” NLT, October 17, 1891.)

When another of its other favorite technologies “slack and steam” was adopted in some local mills, the NLT reported on workers’ criticisms of the system. The paper went on to argue, however, giving details of consequences for the puddler and puddler’s helper, that the smoke and ashes of raw bituminous would have made the work even harder. (“Our Local Industries: Conditions of Pittsburgh’s Iron and Steel Business,” NLT, November 22, 1890; “Our Local Industries: Condition of Pittsburgh’s Iron and Steel Business,” NLT, December 13, 1890.)

180. The NLT was similarly selective as it positioned itself with respect to class interests. Workers both made cross-class alliances and asserted class-specific claims. The NLT was worried from early on about the unsteadiness of the gas supply because iron puddlers were paid by amount of iron produced and unreliable fuel supply meant that puddlers had to work longer hours for the same pay. When the gas monopoly pressured mill managers to have puddlers “change their customary hours of working” from day to night (a time of lower gas demand), the workers’ Trades Assembly forged an alliance with mill-owners and the Pittsburgh Chamber of Commerce to lobby the city councils to allow competition among gas suppliers. Workers saw the common enemy of their alliance as “the Ring” which embodied political corruption, rather than class oppression. (“As to Natural Gas,” NLT, December 26, 1885.)

The NLT, nevertheless, engaged in a direct class-based critique of the effects of natural gas on workers. It compared the jobs created and lost, and higher fuel prices for local workers with unmitigated profit increases for area industrialists. The paper analyzed the gas company’s prices, profits, and wages paid out, and the wages for steel workers and coal miners, to try to determine who benefitted and who had been hurt by natural gas. It concluded: “...the natural gas industry has imposed a 50 per cent cut on wages, has pushed consumers, and has been especially considerate of managers and shareholders of natural gas companies. Thus Dame Nature’s gift has been perverted.” (“Dame Nature’s Gift,” NLT, February 1, 1890.)

181. NLT, August 20, 1890; “Return to Natural Gas,” NLT, December 6, 1890.


184. The change in the orientation natural gas had brought to the city and the entanglement of environmental, commercial and industrial values can be seen in a \textit{Harper’s} magazine article published just as Pittsburgh passed out of its natural gas period. The article explicitly spoke of Pittsburgh’s industrial and commercial boom due to natural gas and the increase in population that had come with it. Once industrial vitality was assured, the writer went on to discuss other gifts of natural gas, taking benefits to non-manufacturing commerce, for domestic life and to the community to all be of the same sort. Immediately after discussing the civic improvements inspired by the reduction in smoke, the writer went on to discuss homes, neighborhoods and domestic life in the newly clean city. (“The City of Pittsburg,” \textit{Harper’s Weekly} 36, February 27, 1892, 202-205.)


189. \textit{NLT} headlines trumpeted “A Pittsburgh Outrage” when gas price increases, which it attributed to the high cost of political bribes, positioned the gas company to “supply only the rich with gas.” “A Pittsburgh Outrage,” \textit{NLT}, Nov. 9, 1889.


192. “A Visit to Pittsburgh,” \textit{NLT}, October 18, 1890.


194. \textit{NLT}, November 15, 1890.


196. \textit{NLT}, August 29, 1891.


198. “Natural Gas,” \textit{NLT}, March 5, 1892.


201. Reed “Pittsburgh and the Natural Gas Industry,” 130-1.


213. Thurston, Pittsburgh’s Progress, 1.

214. Thurston, Pittsburgh and Allegheny in the Centennial Year, 234.


220. NLT, Dec. 20, 1890.

221. “Consume It Of Course,” NLT, Dec. 26, 1891.


223. Thurston, Pittsburgh’s Progress, 117-119.

224. Thurston, Pittsburgh’s Progress, 117-119.

225. Thurston, Allegheny County’s Hundred Years, 206.

226. Thurston, Pittsburgh’s Progress, 118.

227. Thurston, Allegheny County’s Hundred Years, 206; George H. Thurston, Pittsburgh’s Progress, 117-119.

228. Thurston, Pittsburgh’s Progress, 17.

229. Thurston, Pittsburgh’s Progress, 17, 117-119.

230. Thurston, Allegheny County’s Hundred Years, 206.


237. [Cushing et al.], *History of Allegheny County*, 616.

238. Reed, “*Pittsburgh and the Natural Gas Industry,*” 130-1.

239. Reed “*Pittsburgh and the Natural Gas Industry,*” 137.


244. “*A Fuel-Gas Plant,*” *Pittsburgh Commercial Gazette*, May 30, 1891.


247. Reed, “*Pittsburgh and the Natural Gas Industry,*” 132.


250. See smoky day chart in note 35 above.
CHAPTER 3

SMOKE ABATEMENT ACTIVISM AND PROGRESSIVE REFORM, 1892-1911

The end of Pittsburgh’s natural gas period engendered profound civic soul-searching among the city’s residents. Although Pittsburgh had many problems, a surprising proportion of this soul-searching centered on smoke. As the city emerged from its natural gas period, residents struggled to determine which fuel – Ohio or Western Pennsylvania petroleum, one kind or another of manufactured gas, coke, slack or raw lump bituminous – would fuel their industry and warm their homes. Pittsburgh business leaders were determined to retain the gains in real estate and commercial development and in population growth that had accrued during the natural gas era. They had emerged from that period with a diminished sense of their city’s frontier exceptionalism and a greater propensity to judge Pittsburgh by the standards by which other cities were measured. Debate over fuels took on the character of debate over civic identity. Both the Natural Gas Period and the rise of large batch steelmaking had made clear that technological and geographical relationships to raw materials were not static. There were many ways to make money using technology in Pittsburgh, and not all of them depended in the same way – or at all – on coal and smoke. The instability generated by these changing relationships was viewed as both threat and opportunity.
Reasons for Pittsburgh’s unstable identity are multiple and they reflect an interaction between changing local social and environmental conditions and national cultural trends. Locally, the power of a parochial working class culture had given way to a more cosmopolitan elite culture which had begun to judge Pittsburgh by standards common to Great Cities.¹ These changes in class identity and class relations had mixed results for the further shaping of Pittsburgh’s environmental attitudes. The decline of labor republicanism, especially in the wake of the 1892 Homestead Strike, removed one kind of argument for smoke abatement – that workers were owed a decent material and environmental standard as fair compensation for the intrinsic value of their labor. The new dominance of elite culture over working-class culture connected Pittsburgh to a number of cosmopolitan movements: municipal housekeeping, crusading journalism, the social gospel and social work movements, and commercially motivated urban environmental reform expressed in City Beautiful and urban planning efforts. Each of these movements had a unique manifestation in Pittsburgh, however, because of the city’s exceptional characteristics: its parochial and frontier past and its extreme domination by heavy industry. In each of these movements smoke took a particular position relative to Pittsburgh’s many other urban problems. The extent to which a particular movement emphasized or de-emphasized smoke, and the reasons given and values appealed to for this, expressed ways in which the group held to Pittsburgh exceptionalism or to universal civic standards. In one way, disproportionate emphasis on smoke was the clearest way to assimilate Pittsburgh to its civic peers. In another it was the surest sign of strong attachment to what made Pittsburgh Pittsburgh. Finally, it is clear in the struggles of Pittsburgh’s various smoke abatement movements in these years.
to regulate the smoke of metal-working furnaces that the character of Pittsburgh’s economy provided challenges for smoke abatement beyond those faced by most other cities. Struggles over and ambivalence about such regulation embodied Pittsburgh’s characteristic conflict of identities between exceptional industrial outpost and settlement subject to universal standards of urban life.

In this chapter I will first examine the identity and motivations of Pittsburgh’s first effective group of anti-smoke activists, the women of the Ladies Health Protective Association. I will then examine debates about smoke control at the city’s Engineers’ Society which also take the form of debates over Pittsburgh’s fundamental industrial identity and prospects. These debates also exhibit conflicts over the transformation in values discussed in the previous chapter. Next I will examine efforts to get smoke under legal control and the new eagerness of many – including the previously pro-smoke newspapers and the city’s ruling political machine – to appear to support smoke abatement, even if their actions belied such sentiment. Finally I will examine the development of Progressivism in Pittsburgh and the invitation of local Progressives to outside investigators to conduct the Pittsburgh Survey. In particular, I will analyze the place of smoke in the local response to the Survey’s efforts to suggest ways in which the city could be remade. Throughout the chapter I will discuss issues of the relationship between smoke and Pittsburgh’s changing social geography and between worries about the city’s economic vulnerabilities and the way in which smoke control could promote the economic diversification that could save Pittsburgh from such threats. I will examine tensions surrounding seeing Pittsburgh as an exceptional place – exempt from ordinary
civic constraints – exemplified in struggles over the need to exclude the city’s metalworking furnaces from smoke regulation.

3.1 Residential Segregation, Cultural Fragmentation and Municipal Housekeeping

Both the experience of the natural gas period and the middle class response to changing social geography prepared the way for new environmental attitudes in late nineteenth century Pittsburgh. Pittsburgh had remained a walking city through 1860, while in 1868 James Parton noted the beginnings of suburbanization linked to a desire to move out of the smoke. By the 1860s upper class families were leaving downtown, the site of an elite neighborhood established by the 1820s, and moving to Allegheny City, right across the Allegheny River from downtown Pittsburgh. By the end of the Natural Gas Period, the elite neighborhood in Allegheny City, too, was approaching decline. Adelaide Mellier Nevin’s 1888 Social Mirror, a mildly gossipy directory of Pittsburgh’s society women, described the decline of Pittsburgh’s downtown elite neighborhood:

The changes which have taken place in the fashionable residence quarters during the century are noteworthy. In the early days Water Street, which is now given up to manufacturing establishments and ugly dens, was the section where all the most wealthy and cultivated people lived. Later on Liberty Street, Penn Avenue and Duquesne Way became the location most favored by the fashion ... Just before the Pennsylvania Railroad became a notable feature in Pittsburg civilization, Bayardstown ... was something of a place [and] ... enjoyed its golden age. On one of its cross streets in full view of the ingoing and outgoing Pennsylvania Railroad trains, R. H. King built a neat row of brick houses, which in those times were quite aristocratic and elegant, but which now are mainly workingmen’s boarding houses and are in a sad state of dilapidation and decay ... It was not until the city commenced to grow into its present large proportions that society was forced to flee to the freer air of the East End, Allegheny and the suburbs ...
Harrison D. Mason, in his 1924 memoir of the city, writes of Allegheny’s decline, and mentions the homes of two women who, as we will see below, were active in Pittsburgh’s 1890s anti-smoke movement:

I recall when Kilbuck, Miss Kate McKnight’s former home in Western Avenue, had noble old oak trees growing near it, and a fair expanse of green. Now, a large factory has been built nearby, and Kilbuck has been transformed into an apartment house. A similar fate has overtaken the Hostetter mansion nearby. The old Scaife home is now occupied by a public institution.3

Families such as these were moving further away from the highest concentrations of railroads and industries. Pittsburgh’s East End, lifted from rural isolation by the opening of the Pennsylvania Railroad station in Shadyside in the 1850s, and annexed to the city in 1868, became the new center of upper class residence by 1900.4 Yet the East End too, having developed significantly during the Natural Gas Period, would find its environmental quality threatened and its boundaries encroached upon with the return to coal and the expansion of industry at the turn of the twentieth century. In particular, the neighborhood of Oakland, which would become home to Pittsburgh’s new City Beautiful civic center and to Carnegie philanthropies, would be at the center of conflicts over neighborhood identity threatened by industrial smoke.

Increasing residential segregation of classes both embodied and encouraged cultural fragmentation. Pittsburgh’s most important capitalists established residences far from the city: the Mellons in Southwestern Pennsylvania’s Laurel Highlands, H. C. Frick in New York City and Carnegie both in Manhattan and at Skibo Castle in Scotland. Lesser industrialists and businessmen retreated to estates in the East End.5 By the 1890s, when suburbanization was well-established, Pittsburgh’s working class population had expanded dramatically, its ranks swollen with new southern and eastern European
immigrants. As we saw in the last chapter, working-class solidarity as well as political and shop-floor power declined as steel replaced iron and ethnic heterogeneity divided workers. Labor republicanism, as a basis for claiming rights to decent environmental standards in the workplace, home and community, was considerably weakened. Pittsburgh was no longer dominated by what Couvares called “Plebeian culture” and elites in the city who had previously formed “neither a leisure class nor a ruling class strove to become both.”6 This striving, and the freedom from earlier cultural strictures it represented, allowed Pittsburgh’s business and industrial leaders to become enmeshed in the national cultural patterns enumerated above. Local elites turned the resources of national cosmopolitan trends immediately against smoke, the symbol of their own former parochialism.

According to John Ingham, conversion to Episcopalianism was a central part of the cultural transformation of Pittsburgh’s elite. Ingham links abandonment of Presbyterianism with the forging of links to a national elite culture in which Episcopalianism had become “virtually a generic upper-class religion.”7 As Ingham notes, Joseph F. Rishel’s study of Pittsburgh’s founding families showed increasing numbers of Episcopalians in Pittsburgh’s upper classes and attributed this to conversion of the younger generation of established families rather than assimilation of new families to Pittsburgh’s upper class.8 Ingham attributed the beginnings of the conversion process to members of elite families sending their children to Episcopal prep schools.9

Ingham also links the important cultural transformations of this period to the development of the East End suburbs. The East End “remained a rather isolated rural retreat however until the building of a streetcar line out Fifth Avenue in the late 1870s ...
followed in the 1880s by cable cars for the steep inclines.”10 Beginning in the mid-1880s, at the start of the Natural Gas Period, “a large number of palatial homes” were built along Fifth Avenue between the Oakland and Shadyside neighborhoods creating “a vast and opulent millionaire’s row.”11 Ingham argues that the “area [was] designed to integrate the newer and older elites.”12 According to Ingham the new culture of the East End not only stressed a stronger sense of class identity, with the creation of a panoply of social clubs and other organizations, but also wished to reach out to control the broader city, to reshape it in accordance with a newly emergent image of what Pittsburgh should be like. No longer sequestered in the dark, narrow homes of Allegheny, the young generation of Pittsburgh’s iron and steel elite wanted to create a glittering jewel of a city. Many of these individuals had attended college in eastern cities, where their children were attending prep school. They were tired of apologizing for the dark, dirty and disreputable city in which they lived. Pittsburgh had to be remade in the image of the bright, open spacious East End.13

Isolation of the working class and declining environmental conditions due to overcrowding in working-class districts coincided with wider availability of environmental amenities for the likes of the East Enders.14 Along with increased geographical segregation went increasingly unequal distribution of environmental amenities and pollution burdens. Nonetheless, shared water sources, sewerage systems, and public transit infrastructure linked elite suburbanites with working-class urban dwellers. In addition to physically linking the classes, these networks were a powerful symbol of connection. New understandings of disease emphasizing the dangers transmissible through air and water heightened elite anxieties about such links.15 Municipal housekeeping was one response to the tension between geographical separation and networked connection. Noticeably worsening conditions in working class neighborhoods and middle class consciousness of the value of their own access to
municipal amenities combined with nationwide ideological changes to set the stage for the growth of women’s environmental activism in Pittsburgh.16

3.2 Pittsburgh’s Municipal Housekeepers: The Ladies’ Heath Protective Association – Motives and Identity

Pittsburgh’s first movement for a comprehensive anti-smoke ordinance began with a municipal housekeeping campaign. The identities of its leading members, upper class women with husbands and fathers engaged in a wide variety of occupations with differing relationships to smoke, illustrate the technological and economic volatility that characterized post-Natural-Gas-Era Pittsburgh. These women would be among the first to articulate new values for the city compatible with smoke abatement, but they did not represent an occupationally or technologically segregated subset of their class. Instead, the interconnections their biographies demonstrate highlight the multitude of possibilities available at this time for shaping Pittsburgh’s future – with or without smoke.

The Ladies Health Protective Association, organized in 1889 as a separatist municipal housekeeping organization, formed around “three universal and inescapable nuisances” – garbage, polluted water, and especially, smoke – a “nuisance damaging health and comfort.”17 Pittsburgh’s LHPA was modeled on the Women’s Health Protective Association of New York, founded five years earlier. The New York women began their work by opposing slaughterhouses whose stench troubled their own neighborhoods and then moved on to the elimination of other nuisances involving rotting organic matter, impure water and milk supplies, and food uncovered and open to dust. Eventually the New York group shifted to reforms focusing on the conditions of the poor
and lobbied for an anti-expectororation ordinance to check the spread of tuberculosis from lower class men and boys to the middle class who rode streetcars and shared public buildings with them. Pittsburgh’s LHPA moved through a similar series of concerns, but with one difference – their efforts for smoke abatement.

LHPA women were heirs to a multi-generational tradition of elite concern for (and attempts at control of) the poor. As in most American cities, charitable activity increased in the wake of organizing for the Sanitary Fairs of the Civil War. LHPA members, their mothers, grandmothers and aunts were active in these efforts. Mrs. William Herron was a co-founder in 1875 of the Pittsburgh Association for the Improvement of the Poor and was active in the old Relief Society. Miss M. L. Jackson worked on the Home for Aged Protestant Women, the Western Pennsylvania Hospital for the Insane and several charities for the benefit of the deaf and mute. The Social Mirror called Mrs. Harmar Denny, mother of LHPA hostess Miss Matilda Denny and grandmother of activist Kate Cassatt McKnight, “the pioneer in ... organized charitable work.” Mrs. Denny was president of the board of the insane asylum, the Home for the Friendless and the Relief Society. The Mirror also explicitly discussed the charitable work of LHPA members Annie Phillips, Matilda Denny, and Mrs. William Herron. Several other members of the LHPA were connected with the local Red Cross. Into the context of this tradition of charitable work, Pittsburgh’s elite women integrated newer concerns.

The leaders of the LHPA came from Pittsburgh’s highest classes. Of the twenty women who either served on LHPA executive committees in 1892 or 1894 or hosted meetings in their own homes, seventeen were listed in the 1895 Pittsburgh Blue Book.
Seventeen of the twenty were listed in Adelaide Nevin’s directory of elite women The Social Mirror. Eleven of the twenty appeared in the truly upper class 1904 Social Directory. Kate C. McKnight, Matilda Denny and Julia Harding were all independently wealthy descendants of the Dennys, one of Pittsburgh’s founding families, which included Pittsburgh’s first mayor. As early as the 1850s, the Dennys had become wealthy enough to draw income from their estate and not to engage significantly in business.22

LHPA women had links to businesses and industries that both made smoke and stood to benefit from its abatement. Several of their families had business interests that allied them with lighter industries and commercial ventures that provided an alternative vision of economic development to that offered by the heavily polluting metals industries. Mary McClelland’s father was an important builder in Pittsburgh and had built several of its bridges. Mrs. Pontefract’s husband had become a “double millionaire” as a distiller. Others, as noted above and as will be discussed further below, had husbands or fathers who made money in real estate, construction, banking or patent medicines. Nonetheless, several LHPA members were connected directly with the coal, coke and metals industries. Mrs. William Herron and Mrs Lawrence Dilworth both married into the city’s founding families. In these cases both families drew their wealth largely from heavy industry. William Herron was heir to large-scale coal-mining enterprises, and Lawrence Dilworth owned Glendon Rolling Mills, makers of railroad spikes, founded in 1857 and a going concern until 1929. Annie Phillips was descended from a family that made its money as iron founders. Mrs. Schoonmaker’s husband was in the railroad business and then in the coke business. Yet roots in heavy industry did not preclude success in non-industrial occupations. Imogen Brashear Oakley was married to a man
descended from an old iron family who had made his own fortune as a stock broker, retired early and wrote articles for Lippincott’s magazine. Mrs. Lawrence Dilworth’s father-in-law was both an iron manufacturer and publisher of American Manufacturer magazine.

Yet, for women with such connections, one male relative’s business might be in a newer or lighter line while another’s was in one of Pittsburgh’s traditional heavy industries. Some were involved in providing energy alternatives to raw bituminous and others were engaged in enterprises like real estate development that could be directly threatened by pollution. LHPA women’s family connections reflected the complexity of Pittsburgh’s changing technological and economic landscape in this period. One example is Mrs. Herbert DuPuy, nee Amy Susette Hostetter, daughter of Dr. David Hostetter (1819-1888) a “cultivated physician” (formerly a San Francisco grocer and onetime paymaster for contractors to the Pennsylvania Railroad at Horseshoe Bend) who became “the millionaire of Bitters fame.” Dr. Hostetter made his fortune selling his nationally-advertised patent medicine, Hostetter’ Bitters, which was based on a recipe obtained from his physician father. Investing his profits, Dr. Hostetter became a prominent Pittsburgh businessman. He “gave his attention to numerous enterprises calculated to foster and promote the trade of Pittsburgh” including banks and railroads and was one of the founders of the Pittsburgh Chamber of Commerce in 1876. Dr. Hostetter invested in the coal-based manufactured gas industry, modernizing the plants of the Pittsburg Gas Company and the Allegheny gas-works. His manufactured gas experience, and his efforts to construct oil pipelines between the Pennsylvania petroleum fields and Pittsburgh, led him to an interest in natural gas. He was identified by a local historian as
“one of the first to take hold of the natural-gas problem.” He would become president of the Pittsburgh Natural Gas Company, and director of the East End Gas Company and the Consolidated Gas Company of Pittsburgh. He held 40% of the stock in the Fuel Gas Company of Allegheny County and stock in the Penn Fuel Company. Hostetter eventually became proprietor of both companies, which he then sold to the Philadelphia Company of Pittsburgh. The Philadelphia Company was the main, and for a time, the only, natural gas company in Pittsburgh during the Natural Gas Period (1884-1892). Hostetter would retain ownership of one quarter of the stock of the Philadelphia Company and would hold a directorship in it. He also “constructed and carried through to completion the first lines of pipe from the natural gas fields to the city of Pittsburgh” and had conducted experiments that gave him exceptional knowledge of the new energy source. Amy Susette’s brother David Hostetter Jr. (b. 1859) took over many of his father’s business interests after his father died in 1888. He was elected president of the Pittsburgh Gas Company in 1889 and remained so until it was sold to the Philadelphia Company. Natural gas remained a family business during the years of the LHPA’s activism.

Mrs. DuPuy (Amy Susette Hostetter), nonetheless had connections to the coal and steel industries through her husband, Herbert DuPuy. Mr. DuPuy owned coal land until 1923. In 1882, two years before the start of the natural gas period, Anderson, Dupuy and Co. built the Pittsburgh Steel Works which produced “fine-tool crucible steel for manufacture of agricultural and mechanical devices.” The plant comprised “4 sixteen-pot and 2 thirty-three-pot Siemans furnaces, 15 heating furnaces, 1 open-hearth furnace, 5 trains of rolls, [and] 3 steam hammers ...” While this would appear to position Mrs.
DuPuy as caught between familial interests in less-polluting and more-polluting technologies, it should be noted that Siemens furnaces represented advanced and minimally polluting steel-making technology.\textsuperscript{34}

Perhaps the most dramatic example of an LHPA leader with ties to old and new technologies and the ideologies associated with them, was Mrs. Lewis Stillwell, nee Mary Elizabeth Thurston, daughter of Pittsburgh’s greatest booster (whom we have met in previous chapters), George Thurston. It was her father, as we have seen, who articulated, in his periodic celebratory histories of the city, the mythology of smoky, industrious, frugal, virtuous Pittsburgh that was taken up by James Parton and other national writers. Her husband, Lewis Stillwell, was one of the “gifted and ambitious young engineers” (Nicholas Tesla among them) employed by Pittsburgh’s leading technologist, George Westinghouse, to develop the possibilities of alternating current and pave the way for the long-distance transmission of electricity. This Westinghouse group constructed the power station at Niagara Falls.\textsuperscript{35} Fewer than ten years out of college in the 1890s, Stillwell both supervised Pittsburgh work on the Niagara project and was “field engineer at Niagara Falls in charge of installation and first operation as Electrical Engineer and Assistant Manager of the Westinghouse Company.” In 1897, he would be Electrical Director of the Niagara Falls Power Company and the Cataract Company, supervising both construction and operation.\textsuperscript{36} Westinghouse technology, both early efforts in natural gas and these in electricity development, represented richly productive areas of economic development that were independent of bituminous coal and so did not link prosperity with smoke. In fact, smokelessness was an advertised advantage of both hydroelectric power and natural gas. In addition, while George Thurston had celebrated
the local natural advantages that made Pittsburgh’s industries great, Lewis Stillwell’s work on electrical equipment took him around the world and was centered around geographical advantages that Pittsburgh did not possess. For Mary Elizabeth Thurston Stillwell technologies and environmental conditions associated with the work of her father and of her husband could not have differed more dramatically.

Mrs. Frank Nicola’s marriage connected her to economic interests that were not only independent of or competitive with pollution-making industries but which might actually be harmed by them. Real estate developer Frank Nicola would be largely responsible for the building of the City Beautiful civic center in the East End’s Oakland neighborhood in the first decade of the new century. Midway between the eastern boundary of the city at the East End’s edge and the slum at the Point downtown, Oakland was to be a new center of Pittsburgh’s culture. The land Nicola would develop was adjacent to Pittsburgh’s magnificent Schenley Park, built on property donated by expatriate Pittsburgh land heiress Mary Croghan Schenley in 1889. By 1892, the park was home to Phipps Conservatory and Botanical Gardens, donated to the city by Andrew Carnegie’s partner Henry Phipps. In 1895 Andrew Carnegie’s Library Museum and Music Hall would open at the park’s northwestern entrance. In 1905 Nicola and his associates purchased the land from the trustees named in Mary Schenley’s will, one of whom was Andrew Carnegie. Nicola as developer “divided the district into zones, monumental, educational, social and residential.” He set aside “a hillside pasture” for the university, which would be purchased by them in December 1907. The university would move, as Pittsburgh’s elite residents had, from Allegheny to the East End. After a competition to which sixty-one architects submitted designs, architects Palmer and
Hornbostel were chosen to build the new campus: “buildings in Classical Greek style built on various levels of the hill ... a large temple-like building to crown the top, a sort of Greek Acropolis as an intellectual center for Pittsburgh.” In 1909 his firm would also build a major league baseball stadium across from the Carnegie Library. Nicola’s work embodied the new aspirations of Pittsburgh’s elites most threatened by smoke after the decline of the natural gas supply. Much of the struggle over smoke in the 1890s and 1900s, as we will see below, would take the form of a struggle over Oakland.

3.3 The LHPA’s Anti-Smoke Campaign and the Engineers’ Society of Western Pennsylvania

By 1891 the LHPA had begun to take action against smoke. In 1890 Mrs. Imogen Brashear Oakley, later to be one of the organizers of Pittsburgh’s Civic Club, researched smoke-consuming devices, relying on an 1889 report from the Chicago’s Citizen’s Association. LHPA members also visited an Allegheny industrial plant that was successfully operating a smokeless furnace and released a report on its “economic advantages” to the newspapers. In May 1891 they had investigated the successful use of smoke consumers at a leadworks and on the boilers of the Pleasant Valley Railroad Company. The National Labor Tribune, a strong, if bemused, supporter of the LHPA’s efforts, reported that the LHPA was ready “to proceed vigorously in the courts of law” “should any smoke producers refuse to remedy the nuisance.” Although the National Labor Tribune covered the LHPA approvingly, it called for gallantry as a response to the women’s “businesslike” activism – a response shaped by gender stereotypes that would figure prominently in resistance to the organization’s efforts.
By the end of the Natural Gas Period, far fewer Pittsburghers would have concurred with State Supreme Court Justice Agnew that Pittsburgh’s identity could be summed up with “that single word,” smoke. The LHPA’s motives and tactics exemplified the development of a divergent cultural orientation. Nonetheless, the reception of the LHPA’s efforts by skilled workers, engineers and industrialists was marked by survivals of the waning cultural milieu. The crumbling distinctions drawn in the 1860s and 1870s continued to set the terms of environmental debate in the 1890s and beyond. We have previously seen the ways in which smoke had been associated with manly industriousness and eschewal of luxury, and freedom from smoke with feminine frivolity, vanity and tendency to material excess. While the events of the natural gas period violated the necessity and universality of these associations, their resonances would persist as part of the public debate about smoke through the rest of Pittsburgh’s history.

In February 1892 the LHPA approached the Engineers’ Society of Western Pennsylvania as part of a campaign to pass an enforceable smoke ordinance. Although the Engineers’ Society had been a venue for presentation of papers on smoke and fuel waste since its founding in the 1880s, debate at its February and March 1892 meetings exposed conflicts between longstanding and newly emerging views about it. Defense of smoke took on the character of a defense of an older industrial order in a time of great technological change. Engineers’ Society debate was fraught with tensions surrounding Pittsburgh’s tradition of industrial and cultural exceptionalism. Ironically, the language of national and international industrial practice and medical research would be brought to bear to relieve these tensions. Claims about smoke and health were used on both sides of the debate to assign environmental amenities to the category of luxury or necessity.
LHPA speakers also used the monetary value of consumer goods and public amenities to make clear that smoke damage was an economic threat to the city on a par with any potential losses of industrial profits due to smoke regulation.

In approaching the ESWP, the LHPA laid its hand directly on the lever of civic power in Pittsburgh: all of Pittsburgh’s leading industrialists were Engineers’ Society members. Of those who were members in both 1892 and 1907 (when the first occupational breakdown of the membership was available) 45 classified themselves as civil engineers, 27 as manufacturers or their agents, 17 as engaged in other occupations, 16 as mechanical engineers, 8 as superintendents, 3 as contractors, 3 as mining engineers and 2 as electrical engineers. Andrew Carnegie, and B. F. Jones were members. Of 449 members in 1892, 72 gave an iron or steel manufacturing establishment as their primary address. The membership included one husband and one father of members of the LHPA executive committee. Another husband joined in October 1892.

The February 1892 meeting of the Engineers’ Society was “crowded” with “over 100 people ...” and “every seat was filled ... a number of persons ... standing in the hall.” The crowd included “about a dozen members of the Ladies’ Health Protective Association” and a few prominent men who had been enlisted to speak on their behalf. One newspaper noted afterward that “probably only once or twice in the history of the society [had] there been such a large attendance.” The February 16 proceedings began with a speech by crucible steelworks owner William Metcalf. Metcalf had supervised the manufacture of the fifteen and twenty inch cannons (used by the Union Army in the Civil War) at the Fort Pitt Foundry “then one of the most famous gun foundries in the world.” (James Parton had visited and colorfully described the work of the foundry in his 1868
Atlantic Monthly article.) In 1868 Metcalf helped to form a partnership to manufacture crucible steel and in 1886 the firm became the Crescent Steel Company. In 1900 it would be absorbed by the Crucible Steel Company of America. Metcalf was actively engaged in steel-making at Crescent during the 1892 smoke controversies. He was a founding member of the Engineers’ Society and its first president. He had been president of the American Institute of Mining Engineers in 1880, and vice-president of the American Society of Mechanical Engineers from 1882 to 1884. In 1893 he would become president of the American Society of Civil Engineers. Metcalf had also written several highly regarded books on steel.49 This formidable man would be the LHPA’s main opponent at the meetings and his views were likely known to his audience before he took the podium: he had just been engaged in a “controversy in the public press” over smoke.

According to the Commercial Gazette Metcalf was “one of the favorite lecturers” of the Engineers’ Society. At the February meeting he would give his pro-smoke address “... in a smooth, clear, low voice, distinctly heard in the furthest corner of the room and out in the hall.” Metcalf “never once changed the expression of his face” even “when the audience fairly roared with laughter” he “stood there as imperturbable as a rock before the rising tide, never once taking his eyes from the paper.” His speech would be punctuated with “frequent and hearty applause.”50

As we have seen, Metcalf had once been a champion of smoke abatement. In the early days of industrial experimentation with manufactured gas, he had argued for smoke abatement motivated by an interest in coal conservation. Now he attacked the idea of “perfect combustion” as wasteful of fuel and damaging to iron furnaces.51 Though a small-batch crucible steel-maker, Metcalf positioned himself as a defender of iron-
puddling. Much of the iron puddler’s knowledge and special skill, according to Metcalf, consisted in the prevention of oxidation of the metal at crucial points in the puddling process. Metcalf believed that demands for smokeless combustion of coal in puddling would result in “loss of iron, and consequent loss of wages and hard toil wasted” for the puddler. In this way, Metcalf took on the role of defender of labor. It was the iron puddler, pressured toward obsolescence by large steel-masters, whom Metcalf took to be the representative worker. Large integrated mills like Carnegie Steel and Jones and Laughlin were in 1892 just deciding to close their puddling furnaces. John Ingham calls this “the symbolic end of the era of iron in America” yet notes that the puddled iron industry, while declining in proportion of metal production in Pittsburgh, continued to grow in absolute terms for a number of years.52

Metcalf’s position is somewhat puzzling since he did not specialize in the making of puddled iron in his own mill. Iron-making in general, and puddling in particular, however, had become a symbol, in this period, of an older industrial order in Pittsburgh, before the domination of the metals industry by Andrew Carnegie. In the early 1890s small steel firms labored at a disadvantage with respect to large ones because the Bessemer process conferred great cost advantages with increasing scale. Iron and small-batch steelmakers who were part of the old Pittsburgh aristocracy, like Metcalf, greatly resented Andrew Carnegie’s competition, through his introduction of large batch Bessemer steel production. Metcalf was part of a consortium of such industrialists who had in 1879 joined together to inaugurate the Pittsburgh Bessemer Steel Company – an effort to beat Carnegie at his own game of large capacity steel-making. The effort was a spectacular failure, largely because of an unfortunate choice of key technical experts and
managers. Carnegie bought out the valuable plant the company had built and reopened it in 1881 as Carnegie Steel’s Homestead Works. In the aftermath of this debacle, steelmasters like Metcalf salvaged their businesses by creating very successful niche-market enterprises making finished steel in small batches. But, during the 1890s, before their success was assured they continued to resent the domination of Bessemer steel as a threat to the older industrial order. By 1899 the adoption of the Open Hearth furnace, which offered more even benefits to large and small steel producers leveled the playing field somewhat. Independent steel and iron operations remained viable and retained a high proportion of Pittsburgh’s metal production well into the twentieth century. But in 1892, a defense of puddled iron, was a stand taken against the domination of Bessemer Steel.

Much of Metcalf’s argument, as well as the comments of others at the meeting, was framed in terms of the opposition between iron and steel. Metcalf characterized steel-making, done with coke, as nearly, though not absolutely, smokeless. He warned of its lethal white fumes that poisoned the “dickey bird[s]” who perched atop the stacks of steelworks singing “ever so gently ‘no smoke’ use coke.” Such birds, Metcalf’s audience knew, soon fell into the stack to die, overcome with carbon monoxide. Metcalf took a dim view of reliance on coke for the elimination of smoke by sources other than steelworks. He called attention to intensity of pollution caused by coke-making itself: “It would be hard to point out anything dirtier or nastier in the way of a smoke nuisance than a coke oven.” He called forth the image of accelerated despoliation of the countryside through increased coke production. He described the spoiled beauty of the Connellsville Coke Region that he had known in his youth: “… our beautiful mountains … a charming
autumn evening ... the summit of Chestnut Ridge ... that lovely land of hill and dale ... a few dull red flames appear here and there, they increase in numbers to hundreds, and then to thousands and thousands, and the whole country is covered with Parton’s Pittsburg many times enlarged.” Metcalf was no happier with the consequences of coke-making within Pittsburgh’s city limits.

While Metcalf’s chief aim was to prevent the imposition of smoke restrictions on iron mills, he argued that normal steam boiler procedure, under hand-firing, required the alternating periods of perfect combustion and imperfect combustion (subsequent to re-fueling). Metcalf argued that “good automatic stokers” would lesson but not abate the nuisance, since they fed fuel and hence lowered fire temperature, in small increments, but continuously. Metcalf claimed to be putting forward a view consistent with the arguments had he made in 1884 against excessive smoke in his Engineers’ Society paper “Some Wastes of Heat.”54 He argued that “... the best practice ... is a little smoke in the stack ... the best and most economical appliances will produce a minimum of waste and a minimum of smoke, but not an entire absence of smoke.” Metcalf feared that the women of the LHPA were inclined to impose absolute restrictions on smoke-making, restrictions that only steel manufacturers could meet, and thereby gain further advantage over iron makers.

Mr. W. E. Koch took up a similar theme in response to testimonials about smoke abatement in Birmingham (England) read by an LHPA spokesman. Koch was born in England and had worked in Wales with Sir William Siemens in the late 1870s on the Siemens open hearth furnace. He had come to Pittsburgh to be manager of the Spang Steel and Iron Company in nearby Etna and was working in this capacity in 1892.
Although he had worked on the development of the next generation of steel furnaces, Koch, like Metcalf, took up the cause of puddled iron. Koch claimed that he had visited Birmingham when he was a young apprentice and that it had been full of small ironworks that were very smoky but that now

... the old ironworkers are gone – hundreds of men have left the town or gone into other trades. Steel has taken the place or iron ... Steelworks are cleaner than iron works, and so the Birmingham of today is utterly different to the ‘old Brum’ of twenty years ago. The puddling furnaces are gone and the small manufactories that made the smoke ... A great deal of smoke in mills can be prevented, but you cannot stop smoke in ironworks ... Pittsburg will become comparatively smokeless when the ironworks are changed to steel works or vanish all together.55

Koch had previously worked in the iron industry in Glasgow under an ordinance that prohibited the emission of dense black smoke for more than three minutes at a time: “we tried many devices on our puddling furnaces, but the only complete remedy was changing to steel.”56 Nonetheless, this iron master claimed to be using a smoke consumer on his boilers at the Etna mill, in order to save fuel, which incidentally resulted in smoke prevention.

Professor Francis C. Phillips, founding member of the Engineers’ Society, highly regarded professor of chemistry and mineralogy at the Western University of Pennsylvania (to become the University of Pittsburgh in 1908) and father of LHPA executive committee member Annie Phillips moved the discussion beyond the sensitive local issue of iron versus steel. Although discussion of Birmingham’s smoke situation had been used as cautionary tale about the decline of iron puddling, Phillips took efforts to abate smoke in Chicago as worthy of Pittsburgh’s emulation. He was convinced that successful smoke abatement had been accomplished in Chicago and he further argued
that even Pittsburgh mills existed in which smoke consumers attached to heating and puddling furnaces were being used successfully.\textsuperscript{57}

It was LHPA spokesmen H. K. Porter who had read testimonials about the success of smoke abatement in Birmingham and Chicago, who attempted to hold Pittsburgh to standards of environmental quality, or at least environmental concern, upheld in other cities.\textsuperscript{58} Henry Kirke Porter was a locomotive manufacturer, but also “a millionaire blessed with a brilliant wife and a home lovely as a dream” living in “Oakland, that portion of the city where semi-suburban residences of ornate and varied designs [were] ... thickly clustered.” A Chamber of Commerce activist and a prominent member of the strongly Social Gospel Calvary Episcopal Church,\textsuperscript{59} Porter was known for his involvement in charitable and civic affairs and would go on to be elected to the United States House of Representatives in 1903.\textsuperscript{60} Anticipating the line that would be advanced by the Chamber of Commerce later in the 1890s, Porter lamented the “serious and frightful” commercial losses to dry goods merchants from smoke. He bowed to older conceptions of the economic, claiming that no one opposing smoke desired to “ruin the interests of Pittsburg” or to “take bread out of the mouths of the workingmen,” or to “lesson the profits of the manufacturer.” Yet he argued for compatibilities rather than opposition between smoke abatement and economic/practical interests. Porter asserted that no industrialist would prefer to continue making smoke if he could get equal results without it. He defended the LHPA as “practical” and their concerns as “not sentimental” since “If there is anything practical it is the question of our homes.” Health had an even stronger claim to practicality than did domestic life and the discussion repeatedly returned to health questions.
3.4 Smoke, Health, Luxury and Necessity

The language of health would be the currency through which luxury and necessity, the aesthetic and the industrial became fungible commodities. Metcalf characterized the women’s objections to smoke as aversion to dirt and attempted to disassociate the health dangers of industrial pollution from the “dirtiness” of smoke. He repeatedly argued that invisible vapors, such as those produced by the burning of coke or anthracite coal, were more unhealthy than black smoke. He claimed that black smoke had made Great Lakes cities more livable for those with delicate lungs than they had been before the development of coal-burning industry there. When discussing the rejected alternative of burning coal gas, Metcalf described the capitulation of housewifely cleanliness to manufacturing realities: “Even among the patient Dutch (how a Dutchwoman does hate smoke and soot!) They all gave it up, Dutch and all ...”61 Metcalf pretended to flatter Pittsburgh’s women by comparing their smoke-smudged beauty and carbon-protected lungs with those of the unhealthy and unhappy (ugly and unloved) women living in Colorado’s clear mountain air:

Healthy women, where are they to be found if not in Pittsburg? Noble women, beautiful women, women to be proud of the world over, and lovelier girls nowhere. It is for them that our mills roar and our hammers thunder, and for them that they will continue to rattle and rumble through all time ... But is it not a pity to mar such loveliness with this horrid soot? Look in the picture galleries at the beauties of a century ago; they put great ugly patches of black plaster on their faces to enhance their beauty, and will any young man here dare assert that one of our girls with a flake of soot on her fair nose is not infinitely prettier and sweeter than one of those old-time beauties? ... And finally, young man, if you should be so gallant as to remove one of these soot flakes it would not taste near as badly as a piece of sticking plaster, nor would it look quite as badly on your mustache ... 62

Metcalf was, consciously or not, playing on rhetoric that had been used before to connect the beauty of Pittsburgh’s women to the character of the city’s atmosphere. The Social
Mirror remarked “The Scotch-Irish blood which has so strongly impregnated our physical characters, together with the peculiar atmosphere which floats between our hills, seems to have been most beneficial in perfecting womanly charms.” Metcalf’s speech disassociated cleanliness with both health and beauty. The LHPA argued on the basis of health so that their opposition to smoke would not be characterized as purely aesthetic.

In addition to H.K. Porter, the LHPA had enlisted the aid of a physician, Dr. R. Stansbury Sutton, “one of the most prominent physicians in Western Pennsylvania.”63 Sutton was a “prominent surgeon,”64 “a pioneer figure in gynecology in Pittsburgh”65 and proprietor of Terrace Bank Sanatorium for Women in the elite Ridge Avenue neighborhood of Allegheny.66 Dr. Sutton spoke powerfully against smoke:

We are going back into the smoke. We had four or five years of wonderful cleanliness for Pittsburg, and we have all had a taste of knowing what it is to be clean. We all felt better, we all looked better, we all were better. But we are back into the smoke. It is growing worse day by day.67

Metcalf claimed that smoke was healthy because it lessened lung disease in cities like Chicago, by offering the lungs a protective coat of carbon. Dr. Sutton took issue with this, admitting that bacteria could not grow “where there is so much carbon and sulphur” and that “carbon is a great absorbent of noxious gases.” Yet, he went on to argue that “an atmosphere in which plants will not grow, an atmosphere in which trees will not grow” was “not a good atmosphere for man.” He took Pittsburgh’s atmosphere to be of this sort.68 Sutton immediately connected the worsening smoke situation to domesticity, and domesticity in turn, both to women’s health and to the kinds of household goods that would have been portrayed as luxuries in an earlier era:

It [smoke] is grinding the lives out of the housewives of our cities, it is increasing the expense of living. It is destroying furniture, it is destroying fine art, it is
destroying pictures, making people regret that they have spent their money for
good things.⁶⁹

He linked smoke damage to luxury domestic furnishings and to works of art with the
historic underdevelopment of Pittsburgh’s civic culture:

> We all know that in past years Pittsburg has not been up to the mark in her
> institutions; she has not been up to the mark as a city of refinement; she has not
> been up to the mark as a city which commanded the talents in the professions at
> large ... Twenty-five years ago, when I came to the city of Pittsburgh, it was the
> rule that when a man had made a fortune he went elsewhere to spend it.⁷⁰

Sutton went on to describe the effect of smoke on the improvements made in Pittsburgh
during the Natural Gas Period: “If we are going to have a smoky city again, we must
expect to have dirty parks, a dirty court-house, dirty private residences, offices and street-
cars.”⁷¹ Both the court house and Pittsburgh’s first park had been built during the Natural
Gas Period. Health, household comfort and vegetation were the same goods damaged by
smoke in Huckenstine’s Appeal and dismissed as luxuries subordinate to the necessity of
unrestricted industrial productivity. Yet here a physician had been called upon to speak in
defense of these multiple goods, and implicitly, to connect all of them to health.

> Although many questions concerning smoke’s effects on health were open to
debate, a focus on health allowed the LHPA to position itself as defending a necessity of
human life rather than the luxurious aesthetic preference for clean air of a coddled female
elite. LHPA supporters defended the women’s position as practical and not sentimental,
while opponents accused them of seeking more to protect their beautiful complexions
than to protect health.⁷² The emphasis on protection, in addition, allowed the LHPA to
adopt a selfless posture that fit in well with the long tradition of women’s reform focused
on the weak and vulnerable within the family and in society.⁷³ Opponents among
Pittsburgh’s industrialists were not only surprised at the LHPA’s practicality and seriousness, but they also insisted that the organization’s motivations could be reduced to the aesthetic frivolities that the group’s focus on health protection was meant to de-emphasize.

Metcalf’s views of smoke and health did not at this point represent the best of medical or educated lay opinion, though there remained, for both camps, substantial space for argument about the health effects of smoke. As we have seen in previous chapters, smoke had been regarded by some physicians in the 1820s as anti-miasmatic and anti-malarial. Nonetheless, as we have also seen, physicians from the 1810s through the 1840s were concerned with the effects both of oxygen depletion from combustion and the introduction of combustion by-products into the air. Nonetheless, in 1857 Pittsburgh booster George Thurston had quoted a local physician on smoke’s anti-miasmatic properties and called attention to Pittsburgh’s comparatively low death-rate. He connected Pittsburgh’s healthfulness most directly, however, with fuel abundance, of which smoke was a sign, rather than with the direct effects of smoke on the body. Writers describing Pittsburgh throughout the 1870s and 1880s remarked on its low death-rate. Some connected smoke with low mortality, as did the official report of Pittsburgh’s board of health in 1873. James Parton had attributed the view that smoke was healthy to the representative Pittsburgher in 1868, but represented this position as disingenuous in light of the desire of those of means to flee the smoky city for the supposedly less healthful air of the suburbs. Metcalf himself celebrated Pittsburgh’s “rather low deathrate” since smoke served to “mitigate other and worse evils,” but Dr. Sutton claimed that Pittsburgh’s air contributed to the particularly “incurable character” of consumption in
Sutton argued that Pittsburgh’s 1890 death rate was higher than that of Cleveland, St. Louis, Chicago, Buffalo, Detroit, Milwaukee, Louisville and Indianapolis.

By 1892, international medical research had moved away from the view that coal smoke was a boon to health. Traditionally, much concern about the health effects of contaminated air had focused on occupational and industrial health problems. A number of nineteenth century articles drew direct analogies between this kind of contamination and pollution of the air by coal smoke. As early as 1700 Bernardino Ramazzini had noted deposits of foreign material in the lungs of stone workers who had exhibited symptoms of respiratory disease. In 1813 a Dr. Pearson had applied “anthracosis” to a similar condition among coal miners in which coal particles were embedded in lung tissue to such an extent that their presence was evident to the naked eye. By the mid-1870s it was generally agreed that lung damage, both from inhaled silica and inhaled carbon could cause “serious organic disease.” By this time diseases like “miners’ phthisis” “grinders’ rot” and “potters’ consumption and asthma” had been named, and researchers reported the discoloration of lungs as a result of inhalations of contaminants. An American physician reviewed dust disease in 1875 in the Medical Record, taking carbon damage to the lungs of coal miners as a standard of comparison for other diseases. All dusts discolored and disfigured the lungs to some degree, but carbon dust seemed to be the least dangerous. Still, it is clear that by 1892 at least some prominent American physicians took work on “mottled lungs” (see discussion below of the March 1892 ESWP meeting) seriously.
As early as the 1880s concern about various kinds of air pollution shone a new light on industrial medicine’s carbon dust research. Concerns about occupational dust diseases joined worries about fogs, dust from decaying organic matter, indoor furnace gases, products of human respiration, excess carbon dioxide and newly discovered disease germs to form the context in which pollution of the air by bituminous coal smoke could be judged to threaten human health. Researchers conducted animal experiments on the effects of known combustion products, carbon monoxide and carbon dioxide, and attempted to set safe exposure guidelines. Some researchers like Ralph Carr Ellison, who wrote in 1882/3 of the health effects of smoke in ambient air in Newcastle, a city of cheap and abundant coal, like Pittsburgh, disputed the innocuousness of coal smoke. The idea that smoke exposure could exacerbate the course of tuberculosis dates from least 1885. This view contradicts anecdotes dating from the 1860s reporting that sufferers from occupational dust diseases, which were perhaps actually tuberculosis, would go to coal dust-filled environments for relief. Other researchers, in the 1890s, examined health effects of smoke that extended beyond pulmonary carbon deposits, and some pointed to air-purifying and even germicidal effects of smoke. Yet the claim that coal smoke was beneficial to health was by this time a minority view. Work by physicians in Britain’s industrial cities made this clear. Manchester in this period was an important site of smoke pollution in England and an important locus of smoke abatement activism and air pollution research. Manchester’s Medical Officers of Health were sources of much of the most current research in the early 1890s. MOH J. Niven in 1891 argued that Manchester’s high mortality rates were largely due to its smoky air: MOH Tatham in 1890 had even asserted that residents of central Manchester lost ten of their
working years to smoke: “Our people lose 30% of their lives ... The acids of smoke and carbon particles operate upon the lungs for years before they finally destroy them.”

While this research may not have been familiar to all attendees at the 1892 Engineers’ Society meetings, it was certainly well-known to the physicians there.

The preponderance of medical opinion notwithstanding, the meeting’s last speaker sided with Metcalf on health and expanded on his claims. Alexander Dempster, prominent owner of several local coal mines, sometime Pittsburgh City Engineer, and founding member and past president of the Engineers’ Society, introduced an ally from Chicago to speak on smoke and health. Dempster introduced W. P. Rend as a member of the “Smoke Prevention Society or Committee” of Chicago who would clarify what the situation really was in that city. David Stradling identifies Rend as “a visiting Chicago coal dealer who had been fighting against the nascent anti-smoke movement in his own city ...” Rend appeared to have some history in Western Pennsylvania as well, having been proprietor, beginning in 1872 of Laurel Hill Mines and Coke Works in Allegheny County. Rend challenged physicians to prove that smoke was unhealthy, claiming that unburnt carbon was both purifying and germicidal:

The doctors, thirty years ago, in treating the cholera here, not only used in one form the smoke that was coming from your chimneys, but they ordered fires built in the streets of Pittsburg. Was not that for the purpose of destroying the germs, the bacteria, and all bad matter, thus killing the germs of disease? I have frequently thought that your great exemption from grippe this winter was due to you smoky chimneys ... The doctor says that carbon helps to destroy noxious exhalations, the putrefying, decaying matter. Now, the doctor can go still further and tell you it is an antiseptic. It is used in the shape of soot or carbon, the same as charcoal, I believe, in purifying water. Of course, you take a little in the lungs, and you know the air passing through your lungs will be purified by a little carbon. During the cholera times the doctors considered it a specific for cholera. It is laid down as an excellent medicine.
Rend contrasted conflicting theories about smoke’s effect on health with what he saw as the clear economic consequences of smoke regulation. He argued that the effects of smoke on Pittsburghers should be considered with reference to “the thousands and tens of thousands working in these mills, who are drawing their support from these manufactories that cause the smoke” rather than to “retired millionaires” alone. He argued that as evidence of industrial productivity, “The very soot that falls upon your ground increases tenfold the value of your property ... The soot is the very life of your city.” It is significant that these words come from the mouth of a Chicago visitor rather than from a Pittsbourger who had experienced the Natural Gas Period. Rend acknowledged that smoke can “be prevented to a certain extent” but claimed that the ladies here and those in Chicago “are asking for prohibition.” Like Metcalf, Rend believed that the LHPA harbored unreasonable desires to outlaw any emission of smoke from any and all sources.

3.5 Newspaper Representation of the Meeting: “Strongly Smoke”

Engineers’ Society President Alfred Ephraim Hunt, civil and metallurgical engineer, president of the Pittsburgh Reduction Company, the firm that pioneered the revolutionary Charles M. Hall aluminum refining process, concluded the meeting: “the facts are that if we can abate any portion of the smoke of Pittsburg I think there is no one of us but will agree that it will be for the best interests of the city ... some of the smoke is necessary ... a great deal of the smoke ... is unnecessary and can be abated.” Hunt said that practical suggestions of methods and apparatus were needed and asked for papers on this in the future.
Despite the plurality of voices heard at the meeting and Hunt’s moderate summation, Pittsburgh’s newspapers described its tone as “strongly smoke.” The Chronicle Telegraph, in an article headlined: “The Smoke Nuisance: It Can Be Abated By Abolishing Manufactories,” summarized Metcalf’s views, which had apparently also been communicated to the paper several weeks before. The article included nothing of the responses of other speakers. The Pittsburgh Times summarized the views of various speakers but emphasized Metcalf’s claim that the kind of flame that produced the radiating heat necessary for iron production was intrinsically somewhat smoky. The Times’ headline echoed the Telegraph’s: “CLEAR SKIES ... Can be Had at the Expense of Pittsburgh’s Manufactories.” The headline continued: “Consumers Are Misnamed: They Save 20 Per Cent of the Fuel That Is Wasted in Smoke. Where Only 5 per Cent Was Ever Lost. An Atmosphere Clear Of Smoke Means Not Only the Loss of Mills But an Unhealthy Community As Well.” The paper reprinted Metcalf’s address in full. The Pittsburgh Post concentrated on the objections to abatement put forward by Metcalf and others: stokers “only dilute ... our nuisance ... [and] ... must stink in the nostrils of prohibitionists”; coke-making would destroy the countryside in order to have clean city fuel; bituminous coal smoke was healthy; anthracite vapors were more dangerous though invisible; and smoke could only be eliminated by separating oxygen from nitrogen in air. The article described LHPA spokesmen and the testimonials they read as “paint[ing] the evil in glowing colors” but claimed that smoke’s defenders were able to “rebut [sic] the facts” offered there. It emphasized arguments that connected Birmingham’s new found cleanliness with the replacement of iron by steel. The article gave the last word to Rend: “He said smoke could be abated, but a portion would remain and could not be stopped,
unless Pittsburgh was willing to give up its industries and become a little country town.”

While the reporting on the February meeting of the Engineers’ Society largely supported pro-smoke views, other articles that appeared in Pittsburgh papers around the time of the meeting were not univocal. As early as May 1891, the Chronicle Telegraph had reprinted an article on the “Cost of a London Fog” from Leisure Hour which calculated the extra cost of illuminating gas and of candle and lamp light. Ten days before the February ESWP meeting, the Commercial Gazette reported that “numerous complaints are being heard from business men and other residents of the city regarding the fast growing practice of using cheap coal for fuel in many of the large downtown office buildings.” These Pittsburghers were concerned that “many of the handsome granite and brick structures erected during the last two or three years are losing all their beauty of exterior by becoming soot-begrimed.” The paper saw the solution in the use of “coke or hard coal” but complained that these alternative fuels were being ignored because “the reason that its cost is a little higher than that of soft coal or slack.” The paper pointed the finger directly at the new Federal Building downtown: “the government could afford to purchase coke or some other clean fuel.” The advent of steam-powered elevators in downtown office buildings exacerbated smoke production. “Architects and builders say that this practice [the use of cheap smoky fuel] will deter capitalists from erecting granite structures in the downtown district,” the paper lamented. Three days after the February meeting the Commercial Gazette trumpeted: “The Smoke Problem Solved: A Wonderful Furnace That is Creating a Revolution in the Smoke-Preventing Line.” The paper claimed: “That the smoke Problem has been completely solved no
longer admits of a doubt.” The Mackenzie Economic Smokeless Furnace had been operating on with the boilers of Weyslan Brothers Tobacco Factory in downtown Pittsburgh.\textsuperscript{103}

The \textit{National Labor Tribune} took a different view in an editorial summarizing Metcalf’s speech after the February meeting. The paper said that he was charged “to explain to the ladies why smoke cannot be done away with in the ‘Smoky City’.” The \textit{NLT} argued that smoke from the puddling and heating furnaces was responsible for relatively little of the smoke problem. It was in the interest of protecting these furnaces and the iron-workers who made up much of the \textit{NLT}’s readership, that Metcalf had argued against smoke abatement in general. Instead of joining with Metcalf in defense of this constituency, the \textit{NLT} editorialist took the claims made at the meeting about the preponderance of smoke raised by power generation to be an argument \textit{for} rather than against smoke abatement.

But there is comparatively little smut that comes from puddling and heating furnace stacks and it is confined to the riverside and is dispersed by the prevailing winds into the valleys, doing the least harm possible and certainly not enough to raise a row about. The smokiness of the city of which complaint is most made, and which can be done away with conveniently, is from steam-raising. There is much more smoke from the boiler furnaces attached to elevator plants than from the puddling and heating furnaces. And there is as much smoke from boiler furnaces generally that were it done away with Pittsburg would be a clean city. Mr. Metcalf admits the feasibility of consuming coal under boilers with very little resultant smoke and with decided increase of heat at the same expenditure of fuel. This is the direction that smoke reform should take.\textsuperscript{104}
3.6 Opposition to Smoke Abatement: In Like a Lion and Out Like a Lamb

By the March meeting of the Engineers’ Society, which included further discussion of health effects and engineering solutions, the sentiments expressed within the group had reached a tipping point. Between the meetings the LHPA and their supporters had not rested. In fact a smoke ordinance had been proposed in Pittsburgh’s Select Council on the preceding February 29. By the time of the March 15 Engineers’ Society meeting, a vote on the ordinance had been twice delayed in the Select Council, for the second time just the day before the March ESWP meeting. (Councils’ action on this bill will be discussed below.) Discussion at the Engineers’ Society did not touch on the council’s action. Its focus was to be limited to “the action of flame and the control of smoke ... and the description of smoke consuming appliances.” Some “friends of the society” were being granted the right to “discuss the effect of smoke on our city” in addition. Professor John Williams Langley, former professor of chemistry and metallurgy at the Western University of Pennsylvania (later, the University of Pittsburgh) was, in the early 1890s, a member of the “metallurgical research staff” at William Metcalf’s own steel works, where he would “[make] important contributions to the fine art of tool-steel making in the open hearth as well as in crucible furnaces.” Langley confirmed Metcalf’s view as a general theoretical proposition: “smokeless burning of bituminous coal or indeed, of any hydrocarbon fuel, is only possible by having an excess of unconsumed oxygen in the upper part of the flame, and this free oxygen is prejudicial to the manufacture of wrought-iron and steel in certain stages of work.” Yet Langley departed from Metcalf’s claims about the compatibility of this minimal necessity with smoke abatement: “we need to produce only a little smoke, just enough to show that the oxygen is largely consumed
and the carbon is slightly in excess.” He claimed that the natural gas period showed that “even the puddling-furnaces have been run with comparatively smokeless fires, and no appreciably greater loss of iron or impairment of its quality has ensued ... the chemically necessary production of smoke may be very much reduced over what is now tolerated when these furnaces are fed with coal.” Langley also asserted that “Steel furnaces burning either natural or producer gas do not, under what is now considered good practice, produce any very large quantity of smoke.”

Yet, Langley found a way to make peace with Metcalf by emphasizing sources of smoke other than puddling furnaces. Aside from puddling-furnaces, coke ovens, and household fires, boiler fires were Pittsburgh’s biggest smoke makers: “Probably in Pittsburgh they equal all other causes of smoke combined.”109 Although Langley failed to use his technical expertise to bolster his employer’s argument against smoke regulation, he seemed to have hit on a compromise position – one hinted at in the previous meeting. Perhaps Metcalf’s contentious point about iron furnaces could be put aside if all agreed that there were no good excuses for smoke-making by commercial boilers.

Langley used chemical and engineering expertise to rebut Metcalf’s argument. The LHPA would also bring additional medical expertise to bear. The organization had invited Dr. Sutton’s good friend, Dr. W. H. Daly to speak about smoke and health on their behalf. Daly was “one of the world’s greatest laryngologists”110 and “the first physician in Pittsburgh to make a specialty of throat diseases.”111 Daly directly challenged Metcalf’s claim that “There is nothing particularly unhealthy about smoke.” He noted that visiting singers feared the “Pittsburgh Grippe” and that smoke was hardest on those with weak lungs. Daly acknowledged that “Mr. Metcalf stated that. ‘A reference
to the statistics will show that Pittsburg is not so particularly unhealthy, but on the reverse it enjoys a rather low death rate.” Daly explained this with reference to the city’s salubrious geographical situation. In spite of this fact Pittsburgh had “a death-rate for 1890, larger than Cleveland, St. Louis, Chicago, Buffalo, Detroit, Milwaukee, Louisville, Indianapolis, and other cities, none of which are as eligibly situated for perfect hygienic and sanitary protection as Pittsburgh.” Daly argued that the deathrate during the Natural Gas Period had been significantly reduced during the period when natural gas was cheapest.112

Daly answered the previous meeting’s dismissals of smoke’s health dangers by relying on the medical literature connecting smoke and industrial disease reviewed above.

The deposit of foreign substances in the lung-tissue, whether it be the residuum from smoke, soot, the dust from grinding tools, or the fine particles that escape from the manufacture of flour, the dust of the grain in the malt-house, all induce consumption of an incurable character.113

He sarcastically adopted Metcalf’s emphasis on smoke and beauty, even as he spoke on behalf of the LHPA:

Physicians who have had occasion to examine the lungs of deceased Pittsburghers usually notice that they are of a dull red, mottled color, If you ask if this does harm, I answer, Does it hurt to spur the jaded horse? Mottled lungs went out of fashion to some extent during the natural gas era, but they are coming in again ... Is it pleasant to think that beneath all the beauty of lip and cheek is concealed a pair of mottled lungs? What wonder is it that the beautiful women of Pittsburg fear for their beauty with the return of smoke if their lungs are to be made to resemble a slate mantle?114

Daly’s rhetoric subtly critiqued Metcalf’s view of smoke as a necessity and the desire to abate it as a frivolous aesthetic concern reducible to feminine vanity.
Engineers’ Society discussants converged toward views that de-emphasized the iron furnaces that had historically been the most important source of Pittsburgh’s smoke problem. Railroad chief-engineer and future Engineers’ Society president (1893), Max Jospeh Becker suggested that smoke abatement on locomotives might be the easiest goal since there was no product that perfect combustion could damage. Yet even this suggestion was met with Dempster’s concern that abatement and not “abolition” of smoke should be suggested. Consulting mechanical engineer and Engineers’ Society member Charles Hyde argued that even if puddling and heating furnaces needed to make smoke, it was possible to eliminate smoke in other aspects of metal production. He went on to argue that at the very least smoke should be eliminated among “business blocks and small manufacturing concerns ... ” which “do more to pollute the atmosphere than do the iron works where production of some smoke is admittedly necessary.” This was especially desirable since the available abatement technologies worked best on steam boilers. He added that mechanical stokers meant labor saving, especially in large plants but also in small ones. Mechanical engineer, Engineers’ Society member, and U.S. Pension Agent Daniel Ashworth warned that “violent urging or the overtaxing of fires will produce heavy smoke” and that smoke reduction experiments have worked best when steam power requirements are relatively unvarying. Engineers’ Society member James M. Bailey, of the Sligo Iron Works had been looking into stokers but had not yet found one “applicable to rolling mill practice” since fires under steam boilers in rolling mills needed to respond to violent urging. Instead, Bailey suggested starting a “school for educating firemen” and urged “police employed and ... fines placed” for firemen who did not follow smoke reduction rules. Bailey lived on a hill above the stacks so of course
wanted abatement. At least one newspaper would adopt Bailey’s indictment of firemen as the source of the real problem. Member Chester Bidwell Albree, president of the iron works bearing his name, and future president of the Engineers’ Society (1903) had had good luck with smoke consumption by resetting boilers in his plant, and making bridges in his furnaces, so that no smoke was produced except when new coal was added. Those who experimented with smoke abatement reported moderate to minimal gains from fuel economy. Because of the cheapness of local coal, fuel economy did not seem to be a strong motive.

Instead, even for some of the engineers, the costs of smoke damage to household and luxury goods was a more important factor than fuel cost savings. The 1891 Engineers’ Society president, Thomas Paschall Roberts, civil engineer of the United States Engineer’s Office in Pittsburgh, claimed to have lived in “twelve different parts of Pittsburg” – on hills, in Allegheny, and in the East End. He asserted “What we are concerned over in Pittsburg is damage done by smoke to our household furniture, works of art, etc.” Roberts argued that such damage could be appreciably reduced by regulating “steam engines, boilers in large buildings used for running elevators, etc. candy factories and things of that class, right in the city limits.” He suggested that “we should confine ourselves, in my estimation, to the abolishment of smoke under such boilers. Our manufacturing establishments, with one or two exceptions, are so located as to cause very little annoyance to the beautiful complexions of our lady friends. I think nearly all of the ladies live in parts of the city where the smoke nuisance from the manufacturing establishments will not injure them.” He argued that “if the city were properly districted some ordinance could be made to abolish the smoke within these districts.” Roberts had
hit on almost all of the salient features of the ordinance that had already been proposed in the Select council: regulation of boilers only and only within the East End. The implications of the characteristics of this ordinance will be discussed below. While metal-furnace smoke abatement remained a contentious issue, the Engineers’ Society consensus – and the only smoke abatement legislation at hand – would studiously refuse to regulate any of the smoke from Pittsburgh’s mills. Mill smoke regulation would remain the central point of contention in smoke-abatement debate in Pittsburgh for more than two decades to come.

Though Roberts had outlined the solution most likely to be adopted, other meeting participants continued to discuss more contentious matters. They considered whether devices were in operation that satisfactorily abated smoke from puddling furnaces. Many spoke as if they had been seriously engaged in smoke abatement experiments in Pittsburgh. A climate seemed to exist in which everyone was watching one another’s stacks and had a conception of the combustion equipment connected to them.119

The meeting also provided an opportunity for representatives of mechanical stoker companies to promote their products. Charles Townsend who joined the Engineers’s Society on the occasion of the March 1892 meeting took the opportunity to provide “a brief description of the Roney Mechanical Stoker ... [to] those who have never had an opportunity to see one in operation.” Townsend added the caveat that boiler capacity needed to be high enough for stokers to work. A visitor, F. C. Jahn described the McKenzie Economic Smokeless Furnace.120 Representatives for Roney, Murphy, and Brightman stokers were also present.
Even coal mine owner Alexander Dempster\textsuperscript{121} seemed genuinely interested in the workings of mechanical stokers at the March meeting. He moved to establish a committee to investigate the best means of smoke abatement. Dempster himself was to chair the committee and he was to be joined by Pennsylvania Railroad Consulting Engineer, Thomas H. Johnson; steel mill consulting engineer, Charles Hyde; Chairman of the Scaife Foundry and Machine Company, William Lucien Scaife; and metallurgical chemist and academic, John Williams Langley.\textsuperscript{122}

Of these, Dempster had spoken strongly against smoke abatement. Hyde had espoused the view that while smoke making was necessary in puddling and reheating (iron or steel) and in “a number of cases of that kind” it was not necessary in the operation of boilers in “the business blocks and small manufacturing concerns.”\textsuperscript{123} Hyde, who had been a consulting engineer for the Aetna Iron and Steel Co. in Bridgeport, Ohio had also conducted tests of stokers on the boilers of the plant to determine fuel economy and steam production and had worked in Cincinnati when a smoke ordinance was in effect. He seemed to have a great deal of practical experience with smoke abatement, but was critical of many smoke abatement device testimonials as “not worth the paper they are printed on” and was quite skeptical of the ability of any abatement device to function well when the fires were strongly urged as they would be in iron and steel making.\textsuperscript{124} Langley had argued that while some small amount of smoke was necessary from puddling furnaces and a little in steel melting, the amount could be greatly reduced over what it currently was. He shared with Hyde the view that smoke reduction for non-industrial boilers was the first obvious abatement task.\textsuperscript{125} Neither Johnson nor Scaife had expressed opinions about smoke in the public debate.
The committee would report back to the Engineers’ Society in November, but was clearly composed of people who would recommend an ordinance much like the one then under debate in councils – one that would not threaten the likes of Alexander Dempster with smoke “abolition.” What such a smoke policy would mean to the city will be discussed below.

Since the February meeting, giving at least some lip-service to the cause of smoke abatement had become de rigueur in Pittsburgh. Newspaper coverage of the March meeting was more sympathetic to the anti-smoke side. Papers concentrated on Dr. Daly and Professor Langley’s replies to Metcalf. One subheader read “Prof. Langley Shows that Iron Can Be Made With Very Little Smoke and Dr. Daly that Smoke is Not so Very Healthy. Manufacturers Express Their Ideas.” Another newspaper summarized the meeting in its headline:”Smoke – Was Agreed to be Harmful, But Remedies Are Not Readily Applicable – Good Stokers Too Costly – Firemen Can Prevent Smoke.” The Pittsburg Post quoted Daly’s claims about the city’s reduced deathrate during the Natural Gas Period in “Death In Smoke: A Doctor Tells About the Lungs of Pittsburghers” The newspapers, however, were quick to blame workers, furnace firemen, for the problem rather than manufacturers.

3.7 Legislative Action on Smoke

The Engineers’ Society committee would not report back until November. When they did, their recommendations would conform well with the ordinance eventually passed by the city’s councils. Legislative action on smoke had begun in Pittsburgh’s Common and Select Councils at the end of February – midway between the two Engineers’ Society
meetings at which the LHPA was present. The Councils’ actions make clear just how important appearing to support smoke abatement had become. Yet the smoke abatement actions taken by councils would also steadfastly protect heavy industry and in doing so fail to address the most significant source of pollution in the city.

Pittsburgh’s bicameral council was a large and unwieldy organization, with one councilman from each of the city’s thirty-six wards in the Select Council and at least one per ward in the Common Council, with additional councilmen allocated to more populous wards. The Councils, and Pittsburgh politics generally in these years, were controlled by the Magee-Flinn political machine. The machine achieved substantial control by 1879 and persisted in its unbroken domination of councils through the 1890s. Pittsburgh’s Republican boss, Christopher Lyman Magee had gained political experience as city treasurer in the 1870s and would eventually become state senator. He was a member of the upper class, “a close friend of a number of old-line iron and steel men” and was at one point an iron-mill owner. Magee was said to have visited New York City to learn from the successes and failures of the Tweed machine. By 1892 he was owner of the Pittsburg Times and president of two traction companies and a director of five more. His partner William Flinn was a contractor linked to streetcar franchises and would become chair of the Pittsburgh Republican City Executive Committee and later a State Senator. Magee and Flinn were Republicans, the party of Pittsburgh’s native-born elites, yet they garnered support from immigrant workers and from businessmen, small and large, who could benefit from city contracts. They were closely linked with local railroad, streetcar and incline companies and with the banks that held the city’s funds.
The machine’s primary means of control of the city was through control of the
councils. Members of the city councils were “largely from the ranks of the working
class or small proprietors.” According to Ingham the machine ran “candidates for ward
office who reflected the social and cultural background of that area” and “elite candidates
for citywide offices.” While Tarr minimizes immigrant and working-class support for
the machine, Ingham contends that the machine’s control depended on its “manipulation
of patronage in working-class and ethnic districts.” Lincoln Steffens in his 1903
McClure’s magazine article, “Pittsburg: A City Ashamed,” characterized Christopher
Magee and William Flinn respectively as “Molasses and vinegar, diplomacy and force,
mind and will ... ” Steffens says “Magee was the sower, Flinn the reaper. ... The men
Magee won Flinn compelled to obey, and those he lost, Magee won back.”

The Magee-Flinn machine was interested in appearing to support the cause of
smoke abatement in 1892, yet they undertook coordinated action to protect heavy
industry from its effects. Two ordinances, one to “regulate and suppress the production
and emission of smoke from bituminous coal” and another “authorizing and regulating
the erection and operation of coke ovens ... ” were introduced in Select Council and acted
upon in tandem. The proposed coke oven ordinance would grant the Jones and Laughlin
steel corporation an exception to the 1864 ordinance that prohibited the operation of coke
ovens within city limits. It would authorize Jones and Laughlin to make coke for their
own use, on their own property, in coke ovens of a design acceptable to the city councils.
The general smoke abatement ordinance prohibited all discharge of bituminous coal
smoke from boilers within a specified district. It is not clear what role the LHPA had in
drafting the general smoke-abatement ordinance, but the form it took represented
opinions expressed at the Engineers’ Society discussion they had facilitated. The organization was the widely acknowledged central force for smoke abatement in Pittsburgh at this time. The two ordinances were introduced on February 29, 1892 and referred on that day to the council’s Committee on Public Works.145

The smoke abatement ordinance was introduced by Anthony Keating, an Irish Catholic iron mill manager who had initially lived in, served on the school board of, and represented Pittsburgh’s first ward, the slum area known as “The Point.” After 1883, Keating represented the 20th ward, in Pittsburgh’s East End, and the 1895 Blue Book gives him an East End address.146 He had clearly moved up in the world. In 1896 the three and half acre works he managed in the first ward employed 800 workers and included puddling furnaces, but it would be safely outside the boundaries of the smoke abatement ordinance.147 It is significant that a mill manager was chosen to introduce the ordinance.

The coke oven ordinance was presented by John Paul, representing the 32nd Ward, Mount Washington, formerly Coal Hill, which overlooked the city from the south.148 Paul was an Irish-born orphan who had been raised in the household of Mayor Magee’s grandfather and was “an active worker in the ranks of the Republican party.”149 Both the legislative consideration of these two ordinances in tandem and the newspaper coverage of legislative action show how public efforts for smoke abatement had become important political tools. Two weeks after their introduction on February 29, councils considered the ordinances again, on March 14, 1892, the day before the next Engineers’ Society meeting was to take place. Councilman Keating, who had presented the smoke abatement ordinance in the previous meeting, moved for a vote on final passage of the coke oven
The bill was passed unanimously by twenty-four members of the Select Council in attendance and sent on to Common Council. Common Council would pass the bill the same day, but not without some debate and consideration of delay. The Boss’s brother, William A. Magee, representing Oakland, moved to postpone further consideration of the bill until the next meeting, but his motion was defeated. The Pittsburg Press found Magee’s failed motion for delay worthy of reporting. William A. Magee was clearly working for the machine – by 1895 he would serve as co-vice-president of the Republican City Committee. He was also eager to appear to represent the interests of his ward – just as machine candidates for Common council were selected to do. Magee endorsed Oakland’s civic center identity. Carnegie’s library, museum and music hall, which would open to the public in 1895, would form the keystone, alongside Schenley Park, of the neighborhood’s City Beautiful complex. William A. Magee would be one of the library’s original trustees. Jones and Laughlin’s coke ovens, already built (illegally) at the foot of the bluff at Oakland’s southern extreme, threatened his ward with their smoke.

Councilman James E. Flinn, a glassblower representing the heavily industrial 28th Ward on the South Side called the ordinance “practically a favor for Jones and Laughlin” who “paid $100,000 a year taxes.” Flinn argued that “They use smoke consumers and should be permitted to build more ovens, even if it does injure the foliage in Schenley Park.” Magee cautioned Flinn that “as far as he could see this plant did no injury, but he wanted an ordinance drawn so closely that no other concern could come in and build a plant that would do injury.” Jones and Laughlin manager, W. C. Quincy claimed that the ovens “had perfect combustion and what little smoke escaped from their stack would
not inconvenience any of the residents.” Councilman Joseph L. Wright, a clerk, who represented the East End ward adjacent to Oakland and containing Schenley Park (Ward 22, Squirrel Hill and Homewood), exhibited a photograph of the Jones and Laughlin coke ovens. Wright moved for final consideration of the bill. Twenty-four members of the Common Council were in favor of the bill and five were opposed. 157

Boss Magee was not above staging a debate like that which had occurred over the coke oven ordinance, with two councilmen both doing his bidding taking opposite sides. With respect to the coke oven ordinance, Magee’s brother could play the good cop for those concerned with smoke abatement. Flinn – bearing the same name (perhaps only coincidentally) as Boss Magee’s political partner, William Flinn – could play the bad cop, enforcing the real wishes of the machine: that Jones and Laughlin have their way. The Pittsburg Times, the paper owned by Boss Magee, and generally representing the Republican machine’s viewpoint, referred to the Jones and Laughlin coke oven ordinance as a “Measure Authorizing the Building of Coke Ovens” in its headline but as a regulatory measure in the body of the article. 158 The paper took both the coke oven bill and the smoke abatement ordinance as referring to the “smoke-consuming question.”

The Pittsburg Press, the city’s largest circulation paper, was Republican in viewpoint but was not known as a mouthpiece of the machine. 159 It characterized the Jones and Laughlin coke oven exception as a victory for smoke abatement. It offered the tall-smokestack construction on which the coke ovens were based as a generalized remedy for Pittsburgh’s smoke problem, in this way connecting the two ordinances that had been considered in the meeting.
Councils yesterday passed an ordinance relating to the smoke evil that is important, as it looks to a means of improvement in this respect. The ordinance forbids the erection of coke ovens, except as approved by the chief of the department of public safety. The purpose is to compel the owners of coke ovens to build them on the pattern of those used by Jones and Laughlins at Frankstown. These ovens are built with tall smokestacks, so that the smoke and gas are carried high in the air, where they do no particular damage. This seems a simple solution of a problem that is troubling Pittsburgh a great deal. It only remains for the chief of the department of public safety to see that it is followed by those who are immediately concerned. If high smokestacks will prevent coke ovens proving a nuisance in their neighborhood, why should not the same thing be tried for other establishments that make smoke? If the smoke cannot actually be consumed, the next best thing is to get rid of it by charging it high above where people breath and live. Evidently by keeping after this smoke question Pittsburg may learn something about it after a while.160

The suggestion that tall smokestacks could be a solution to pollution from the Jones and Laughlin plant below the bluff atop which Oakland was situated, as we will see below, was particularly disingenuous.

Claims that the coke ovens were models of smoke control must be met with skepticism. It was this claim, that the existing J&L ovens were models to be emulated that led the councils to include provision in the ordinance requiring the approval of the Chief of the Department of Public Safety for any coke ovens to be built. As long as new ovens were like J&L’s prototypes, they would be permitted. With this safeguard, the bill passed in both Common and Select Councils. Contrary to J&L manager Quincy’s claim, however, coke ovens necessarily burn coal with minimal oxygen and so cannot have perfect combustion. They perform one of the most strongly polluting operations associated with metals manufacture.

Doubtless Jones and Laughlin was connecting the two ordinances too and sought the exception to the existing ordinance because it recognized that increasing anti-smoke activism could lead to its being held accountable for its violations of an existing law – an
ordinance dating from 1864 prohibiting the construction of coke ovens within city limits. As we have seen both from William Metcalf’s musings at the Engineers’ Society and from discussion of city ordinances in previous chapters, coke production within city limits was one of the least tolerated forms of air pollution in Pittsburgh. Nonetheless, the city’s history included a number of attempts at urban coke-making. As early as 1833 there were coke ovens at the base of Coal Hill. As we have seen, in 1849 Pittsburgh councils had already debated, but failed to pass, an ordinance that would have prohibited the construction of coke ovens and brick kilns within municipal limits. Nonetheless, when iron-smelting began within the city itself, local ironmasters experimented further with making coke. In 1859 rolling-mill owners Graff, Bennett and Company built the first blast furnace in Pittsburgh, since the failed 1794 effort in Shadyside. After experimenting, they rejected cheap local coke in favor of coke from the Connellsville region. In 1864, at a time of increased demand for Pittsburgh iron and increased industrial interest in coke, Pittsburgh actually outlawed coke ovens. The law set the penalty for making coke within city limits at one-hundred dollars per day for every day the ovens were used, one half of the penalty to go to the informer.

Setting a precedent for Jones and Laughlin’s action in the 1890s, and in spite of Graff and Bennett’s judgement about the inferior quality of Pittsburgh Coke, the firm Messrs. Park Brothers &Co. and Park McCurdy &Co. had sought and received an exception to the ordinance’s prohibition in 1867. The exception allowed them to erect coke ovens on the bank of the Allegheny River to make coke for their use alone. Councils reserved the right to withdraw the privileges at any time.
What can we conclude about the effectiveness of this ordinance from the requests for exceptions? Other evidence for the existence or absence of coke ovens within city limits between 1864 and 1892 can help to provide a basis for judgement. In 1868 James Parton had mentioned the coke ovens surrounding the city staring down like burning eyes in the dark. It is not clear whether the ovens to which he referred were inside or outside city limits. By 1872 an atlas of Pittsburgh and Allegheny shows coke ovens in Allegheny City and a bank of 40 coke ovens within the limits of the City of Pittsburgh. These ovens are in Oakland and do not belong to the firm that was granted the exception to the ordinance. Illegal coke ovens, in 1872, were uncontroversial enough to be illustrated in an atlas, even though the Park firm had bothered to ask for an exception to the ordinance outlawing them just five years before. Atlases from 1876 and 1886, however, do not show coke ovens within the limits of Pittsburgh or Allegheny, yet they show coke ovens in nearby townships. Nonetheless, in 1886 *American Manufacturer* identified the city of Pittsburgh itself as a site of coke manufacture. Judgements about the quality of Pittsburgh coal for steel-making and the easy accessibility and attractive price of coke from Connellsville must have played a role at least as large as ordinances in keeping a visible coking industry from developing in Pittsburgh during the 1870s and 1880s. According to Kenneth Warren, “in the mid 1890s well-informed operators in Connellsville still regarded the coal of the Pittsburgh seam beyond the old basin as a steam coal incapable of making acceptable coke.” Even when experiments in urban coke-making were conducted, the governmental structure of the city had made enforcement of existing ordinances difficult.
Jones and Laughlin would revive urban coke-making the early 1890s, but using coal that was mined outside of Allegheny County. The firm had constructed beehive ovens next to the Eliza blast furnaces in the south Oakland and would construct more in the late 1890s on the old Laughlin Estate in Hazelwood. By 1909 the Hazelwood plant with 1,510 ovens would be the “world’s leading cokeworks.” By the time J&L asked for the exception to the ordinance, they were already breaking the law and they were, from all evidence, the only violators. The coke oven ordinance, both for this reason and because of the incoherent claims made about the non-polluting character of the ovens cannot be taken as a smoke abatement measure.

The smoke abatement ordinance was postponed in the same meeting at which the coke oven ordinance was passed. Although the smoke abatement ordinance was passed unanimously by the Select Council, in Common Council it met with some debate. There seemed to be universal agreement that imposing any smoke regulation on heavy industry was unacceptable. The ordinance covered only residential districts in the East End and had extremely irregular boundaries – deliberately drawn, according to one newspaper, “so as not to affect a number or iron works, steel works, oil refineries and other industries for which successful smoke consuming devices have not yet been provided.” It also excluded the business section of the city. Nonetheless, councilman Hugh Ferguson, a builder of metallurgical furnaces, representing an East End ward not entirely free of industry, asked for delay, saying that the ordinance would “interfere with some of the mills.” Ferguson was a designer of experimental puddling furnaces for Carnegie’s mills that could be converted quickly between gas and coal fuel. Experiments with these furnaces at the Carnegie works in mid-May 1891 – “keeping a strict account of the coal
consumed and the labor of firing” – had resulted in Carnegie’s decision that raw bituminous was the most cost effective puddling-furnace fuel.\textsuperscript{177} With Ferguson, Councilman Robert Gracy MacGonigle, superintendent of the Pennsylvania Railroad from the East Liberty section of Pittsburgh, who represented an East End ward\textsuperscript{178} near the city limits said that “there were a number of small establishments in the district and he wanted time to consider.” William Magee argued for the ordinance saying that all industrial plants would be protected from its effects. No one would have to “remodel a mill or furnace in the entire district.” Magee pointed out that the “the only concerns affected [were] the Pittsburg Traction Company, Duquesne Traction Company and Booth & Flinn’s Works.”\textsuperscript{179} His brother, Boss Christopher Magee was president of both traction companies and the Boss’s partner William Flinn was president of the construction firm whose “works” were included in the district.

Pittsburgh’s political bosses were either so eager to comply with the ordinance or so sure that it would not be enforced that they drew its boundaries to include their own works. The machine dared to take this step even though the Booth and Flinn construction yard almost certainly included brick kilns, a heavy smoke producer targeted both in Huckenstine’s nuisance case in the 1860s and 1870s and, along with coke ovens, in the tabled 1849 smoke bill. Flinn’s brick yards would in fact be cited for violation of a more comprehensive smoke ordinance in 1916.\textsuperscript{180} Their inclusion within the boundaries of the 1892 ordinance underscores the inherent limitations of a law that only regulated boiler smoke. The ordinance boundary abutted the western edge of Flinn and Booth’s property and could easily have excluded it by having followed a street one block to the east. Boss Magee’s brother was careful to note the inclusion of Magee and Flinn’s businesses within
the ordinance boundaries and the newspaper Magee owned was careful to report this part of the debate.

Even though the ordinance was written so that it would be of minimal consequence, its passage was still controversial at the March 14 meeting. Councilman Wright, who had exhibited the coke oven photograph in support of Jones and Laughlin, moved for final passage of the smoke abatement ordinance. Unconvinced, Ferguson moved that “further action on the bill be postponed until the next regular meeting.” Twenty-four members of the Common Council voted to postpone consideration of the proposed smoke ordinance to the next regular meeting and three voted against postponement. The machine had presented itself as supporting smoke abatement while assuring those worried about its effects on industry that it would have no effect at all.

After the March 14 council meeting, Boss Magee’s newspaper, the Pittsburg Times, expressed disappointment and argued for the innocuous character of the smoke abatement ordinance and tried to drum up public outcry in support of it.

The refusal of Common Council yesterday to consider the ordinance defining a district in the residence section of the city wherein it shall not be permitted to burn bituminous coal under boilers, etc. without the use of smoke preventors, does not promise well for the abatement of an evil that is daily growing. All that the ordinance aims to do is to compel large consumers of bituminous coal to make a reasonable effort to conduct their business without injury to their neighbors. It stipulates no especial device and sets up no standard of immediate perfection in results. There is no ground to fear that it would be used to put out the fire under a single boiler. It would compel such abatement of the smoke nuisance as may be possible with a fair amount of effort, but unless the residents of the district, who are to be immediately benefitted by it, show a more vigorous interest in it than they have yet manifested, they are not likely to see it in practical operation at all.

The smoke abatement ordinance would finally be passed at the March 28, 1892 meeting of the Common Council with no debate. Councilman Wright (who had exhibited
the photograph of coke ovens in support of Jones and Laughlin) again moved for final passage. Twenty-nine members of Common Council voted for the bill and ten voted against it.184 The ordinance would go into effect on September 1, 1892.

It is difficult to interpret the consideration of the Jones and Laughlin coke oven ordinance and the smoke abatement ordinance in tandem. Jones and Laughlin probably took action to prevent prosecution according to the existing 1864 coke oven ordinance because it realized that resistance to smoke was intensifying. As early as 1891 the National Labor Tribune had reported that the LHPA was ready to take legal action against polluters. While nuisance suits and city ordinances must be independent of one another, Jones and Laughlin must have feared enforcement by the city of the old ordinance if public support for smoke abatement was significant enough to have Pittsburgh’s first generalized smoke ordinance considered in council. Its action was unnecessary as protection against the smoke abatement ordinance itself, which exempted Jones and Laughlin’s coke ovens in two ways: (1) its boundary was along the Monongahela River was Second Avenue and all of Jones and Laughlin’s works were between Second Avenue and the river; (2) the ordinance was directed only at steam boilers.

While, as noted above, it is unclear what role the LHPA had in drafting and pushing through the new smoke ordinance, the organization continued its action on matters independent of it in the late Spring of 1892, working particularly to reform garbage disposal and against railroad smoke. As discussed in previous chapters, ordinances from the 1860s prohibited the use of bituminous coal by railroads passing through the city and a number of individual railroad charters included such provisions.185
In late April 1892 the LHPA sought to enforce old laws, unenforced and largely forgotten because of Pittsburgh’s governmental organization before 1887. Before the 1887 reforms, there had been no adequate means of enforcing smoke ordinances. Until this time, the mayor’s office had no executive departments and any enforcement that might have been done was the responsibility of standing committees of councils. Such committees often failed to achieve a quorum for votes on legislation, let alone to undertake prosecution of individual violators. In 1887 a new charter from the Pennsylvania legislature formed new executive departments under the mayor.

By spring 1892 LHPA had hired detectives to make sure that railroads obeyed the old laws. According to the paper “the detectives have submitted a report, showing the engines on the different roads using soft coal.” The paper claimed that the chief of Public Works Edward M. Bigelow would “look up the ordinance” and would “assist the ladies in the work of abating the nuisance.” The Pittsburg Press claimed that the LHPA had already “compelled the Junction Railroad company to stop using coal” in May 1891. This victory was not definitive, however, and allies of LHPA members would continue to struggle with railroad smoke, particularly from this line, into the new century.

3.8 Enforcement of the 1892 Ordinance

In 1893 Edward M. Bigelow, Director of the Department of Public Works assigned the duty of enforcing the smoke ordinance to the Superintendent of the Bureau of Water Supply, James Joseph Brennan. Brennan started by trying to establish smokeless operation at the city’s Brilliant Pumping Station. The plant began installing stokers in 1893 but in 1894 the superintendent would report that “none of the smokeless devices are
smokeless except under very favorable conditions.” Although at this time Bigelow claimed “we have solved the problem of smoke prevention at the pumping stations,” the pumping station would still be working to prevent smoke as of 1908. In 1913 Mayor William A. Magee (son of councilman William A. Magee and nephew of Boss Christopher Lyman Magee) would identify them as one of the city’s worst smoke offenders. Were technological problems or a lack of will to enforce the ordinance responsible for the persistence of smoke in such a case? As we will see below, the difficulties in accomplishing smoke abatement, both in boilers and in furnaces, were often related to tradeoffs between the work they were required to do and the space available both inside the furnace or boiler and for the physical arrangement of boilers and furnaces within the plant. Thus there was constant tension between the expenditure on real estate and equipment (per unit of production) needed for smoke abatement and the desire to maximize throughput. Whether to regard this as a technological difficulty or as one of misplaced priorities becomes a question of values.

The LHPA saw the problem as a lack of will to do what was right. By December of 1894, the group had delivered a petition to the Select Council protesting the non-enforcement of the 1892 ordinance.

The Women’s Health Protective Association most respectfully petition Councils to amend the ordinance which relates to the prevention of smoke in the East End district of this city in such a way that its enforcement shall be mandatory upon the Director of the Department of Public Works, and not, as at present, left solely to his discretion.

During all the time that the ordinance has been upon the statute books, there has been no apparent attempt to enforce its provisions. The smoke of the East End has not been reduced by one per cent. It would certainly be advisable to attempt the prevention of smoke within the limits defined by the present ordinance before extending its provisions to the rest of the city. The Health Protective Association beg most respectfully to submit that the passage of
ordinances which are not enforced, but which may be violated openly and with impunity, tends to create a popular disrespect for law and indirectly encourages law breaking.\textsuperscript{193}

By 1895 greater smoke consciousness was evident in Pittsburgh. In the winter of 1894-5 the \textit{Pittsburgh Press} had printed numerous letters and articles, many by engineers, arguing that smoke abatement was possible and advisable.\textsuperscript{194} On May 13, 1895 a new smoke ordinance was considered and immediately passed – in Common Council thirty-one to six and in Select Council twenty-two to two. The new ordinance was in some ways stricter and in some ways more lenient than the old. It enlarged the area within which smoke was to be prohibited to include the entire city. Yet, it qualified the prohibition. Instead of prohibiting all bituminous coal smoke from boilers, it prohibited smoke of “more than twenty percent black or dark gray” for more than three minutes at any one time. It still applied only to boilers and so implicitly exempted metal-working furnaces.\textsuperscript{195} At the council meeting, one member (Mr. Wainwright) moved to amend the bill so that the ordinance would “not extend to the engines or smoke stacks used temporarily in construction of public or private work.”\textsuperscript{196} His motion was voted down twenty-one to ten. Most significantly, in accordance with the 1894 LHPA petition, the amended ordinance not only “empowered” the Director of Public works to enforce it but “directed” him to do so.\textsuperscript{197} Magee’s \textit{Pittsburg Times} portrayed councils’ support for the smoke ordinance as “almost unanimous.” The paper quoted Mayor Bernard McKenna: “I will sign that ordinance promptly when it is sent here. There seems to be a general demand for some law that will give the people some relief from the smoke nuisance and from what I know of the ordinance passed Monday, it seems to be a step in the right direction. Then the women seem to want it and I am always for the women.”\textsuperscript{198}
Quick action on the ordinance was due in part to growing public and press consensus that smoke abatement was desirable. A letter to Magee’s Pittsburgh Times, printed a few days after passage of the new ordinance, summed up this sentiment. The cultural changes in the city that had coincided with the natural gas period had now made the city more sensitive to smoke’s effects.

[Natural gas] cleared our skies and showed us that we had, if not the most beautiful, certainly then the most picturesque, city in the Union. As our natural horizons broadened, so also did our aesthetic vision expand – in short we had libraries, beautiful buildings, parks and driveways appropriate to a great city – and all due directly to our clear skies. The grime and soot was an incubus to all advancement. We groped ... in our murky atmosphere, content to gather dollars and only dollars ... What incentive could there be to build a fine house when we knew that in a few months it would be declared defaced and defiled? Why should we buy beautiful pictures, and some furniture and ornaments or gather valuable libraries when the pall would surely destroy them all? If this smoke nuisance is not promptly abated, we will surely sink back into our former indifference ...

Quick passage was also due to a clever activist strategy. The LHPA and its allies intended to make it difficult for municipal authorities to support smoke abatement in words but not in actions. Just as the new smoke ordinance was brought forward in councils, LHPA allies were preparing to sue smoke-makers for nuisance. The choice of firms to sue amounted to an attack on smoke-making by the boilers, both public and private, for which important members of the municipal administration were directly responsible.

Although Magee’s Times was ever eager to portray Pittsburgh’s municipal authorities as in favor of smoke abatement, it could not ignore a direct confrontation over smoke with important Magee interests that had been engineered by the LHPA. On May 17, LHPA spokesman and light locomotive manufacturer H. K. Porter would join with fellow Chamber of Commerce member W. DeWees Wood to file a bill in equity against
the Pittsburg Traction Company, of which Boss Magee was president, asking for abatement of the smoke nuisance from the stacks of their power house in Oakland.\textsuperscript{201} Rumors had also circulated that the LHPA would be filing suit against the Duquesne Traction Company, another Magee-run firm, with the same lawyer. That lawyer denied this claim but said that he thought it “probable proceedings against that company ... [would] be taken by other people.”\textsuperscript{202} It was Magee’s two traction companies, along with the Booth and Flinn brick yard, that the boss’s brother had been sure to point out in the 1892 Common Council debate as within the smoke-abatement ordinance boundaries. In 1892 Magee’s machine had thought it good public relations to include both city boilers and those of its own private businesses within the district covered by a smoke ordinance it could ensure would be unenforced. If the LHPA and its allies could show through their nuisance proceedings, which were entirely independent of the smoke ordinance, that a smoke nuisance existed at these plants, they would be providing excellent (though not legally relevant) evidence that the ordinance was in fact being violated by the very authorities to whom its enforcement was entrusted.

Even the Magee-owned Times could not avoid reporting on these nuisance cases. Headlines in the Pittsburgh Dispatch, a paper supposedly independent of any political faction, did not simply report the actions against the Magee concerns, however. Its headline trumpeted: “Black, Sulphurous, Noxious: Is the Smoke Pouring From the Stacks of the Pittsburgh Traction Company – Bill in Equity Filed to Stop the Nuisance”\textsuperscript{203} The Dispatch reported:

The plaintiffs say that the furnaces in the power house are so constructed as to emit from the stacks large, dense masses of black sulphurous and noxious soot and smoke, which are borne on the air and penetrate all parts of the plaintiffs
grounds and dwellings, injuriously affecting the lots and dwellings. It is also alleged that vegetation in the grounds surrounding the dwellings is being destroyed and their household goods are being damaged. The bill is filed in behalf of the plaintiffs and any others who may desire to intervene.204

Magee’s firms were not the only targets of such action. There was also a suit filed against the Kaufmann’s Department Store alleging that smoke from Kaufmann’s had damaged the H. H. Richardson Courthouse built during the natural gas period.205 Frustrated with enforcement of the ordinance, the LHPA employed the technique of the private nuisance suit, but they invited “any others who may desire to intervene” to join them.206

Other accusations were also in the air. E.M. Bigelow, director of the Pittsburgh Department of Public Works, had been accused in the 1894 LHPA petition of non-enforcement of the ordinance but claimed to have made great smoke-abatement progress at the city’s Brilliant Pumping Station. On May 15, 1895, just two days after the new ordinance had been passed by councils, Bigelow went to Schenley Park, which he was proud to have established for the city, to “make a personal investigation of the report that a great body of smoke was flowing from the smoke stack of the new Casino, near the entrance to the park.” Bigelow challenged the Pittsburg Dispatch’s report of the pollution as “greatly exaggerated” and claimed that “the management of the Casino have a smoke preventer at work at present, but it is not entirely successful.” Despite claims of technological inadequacies, and despite the fact that the park was within the boundaries of the 1892 ordinance, Bigelow deferred action and promised that “as soon as the smoke nuisance ordinance goes into effect, I will go after the Casino and every other concern that makes smoke.”207
The Times still tried to appear to be in the vanguard of the fight against smoke, in spite of the fact that, on top of the nuisance suits against Magee’s traction companies, Magee’s own administration was charged with non-enforcement of the ordinance and with smoke violations from its own boilers at the Brilliant Pumping Station and the Schenley Park Casino. The paper went on to describe the pollution conditions that formed the backdrop of the political and legal action and meanwhile took a shot at the Dispatch which had put forward the report about the Schenley Park Casino and had described the smoke from Magee’s traction company in such colorful terms. The Times now set itself up as a smoke monitor.

Yesterday’s atmospheric conditions were such that the smoke was unable to rise and the begriming conditions in the down-town district were more than usually annoying. It was bad enough all day long, but about 4:45 o’clock there was a combination effort right in the heart of the city that discounted anything that has been noticed since The Times began making observations. To judge of the black deluge that enveloped things in the vicinity of Smithfield Street and Fifth Avenue as a preconcerted effort on the part of offenders to see how offensively they could perform would, in all probability, be doing a great injustice. It was likely just a coincidence that at the hour mentioned the stacks of Kaufmanns, Marshall, the elevator builder in Diamond alley, Solomen and Ruben and the ‘Dispatch’ belched forth the most awful clouds that they have ever been guilty of. Combined they simply obliterated everything. Not a stone of the court house could be seen through the sooty cloud by those who strained their eyes from the upper floor of The Times building to see if it was still there. The Carnegie building was likewise utterly wiped out. That terrific cloud continued for nearly half an hour.

The paper went on to interview pro-abatement industrialists and engineers, some of whom had spoken at the 1892 Engineers’ Society meetings. The engineers featured in the Times were optimistic that technological improvements were possible. They emphasized the importance not just of plant-owner investment in smoke-abatement technology, but also of proper maintenance by engineers and proper operation by firemen. In this way they portrayed the problem of excessive smoke as a technical and
a labor problem rather than simply as the result of a moral failing of plant owners like Magee. The Times also set itself up against the Pittsburg Leader by portraying the other paper as unjustifiably pessimistic about smoke abatement. The Leader had apparently quoted mechanical engineer Daniel Ashworth as claiming that “none of the smoke appliances are generally effective because they are too large for placing in the spaces available in city buildings.” The Times, engaging in investigative reporting, had unearthed a report on a mechanical stoker on exhibition in Allegheny for which Ashworth had written a favorable evaluation on just this point the year before: “I believe you have an excellent system of firing boilers, especially adapted for city buildings where space is such an important factor and smoke abatement is so desirable.”

Finally The Times portrayed the battle over smoke subtly as a battle between paradigmatic forces of good and evil: between a beautiful church and a smoke-belching liquor dealer:

G.W. Schmidt, the wholesale liquor dealer, says an injustice has been done him in ascribing to the stack of his Fifth avenue building a part of the damage done to the handsome Trinity church on Sixth avenue. Mr. Schmidt says he uses gas under his boilers and did so all through the winter even when the supply was most limited. He says he claims to be an enterprising citizen and has an interest in Greater Pittsburg, wants to see it a better and cleaner Pittsburg, has a pretty building and store and wants to keep them pretty and would be glad if others would join him in making no smoke.

Despite the efforts of the Times and the Dispatch to outdo one another in support of smoke abatement, other newspapers remained willing to present other views. On May 19, 1895, The Pittsburgh Leader, not considered to be aligned with any political faction, editorialized against smoke abatement, quoting Councilman Hugh Ferguson, Carnegie’s furnace designer, who had argued for delay in 1892. Ferguson now argued
that technological difficulties were responsible for failures to meet the requirements of the 1892 ordinance. He saw “the proposition to prevent the use of soft coal in all buildings other than private residences as absurd and untenable.” Ferguson made no distinction between the 1892 ordinance which prohibited all non-residential boiler smoke within its district and the 1895 ordinance which outlawed only smoke of certain densities and allowed smoke emission of any density for three minutes at any one time. He argued that manufacturers were “doing their level best to abate the smoke nuisance on their own account, without compulsion” and that all those without “pull” at city hall had already put in smoke abatement appliances, but that those appliances could not always work up to the requirements of smoke ordinances. Ferguson opposed the LHPA’s tactics: “If the means used have been ‘inadequate,’ it does not follow that they can be made adequate by a sudden onslaught in the courts.” Ferguson and the Leader characterized the problem as technical rather than political, legal or moral. They complained that the LHPA legal “onslaught” could not remedy an essentially technical problem. The Leader preferred that smoke abatement not be left to the Ladies, but instead be addressed by Pittsburgh’s businessmen: “Before the smoke crusade is carried any further, counsel should be taken with experts whose judgement as to possible remedies may be relied upon by everyone. We have already suggested that the Chamber of Commerce take up the matter and arrange for a proper inquiry and we know of no quarter in which the contention could be more efficiently adjusted.”

By the time the Leader suggested passing the anti-smoke baton to a men’s organization, members of the LHPA were ready to abandon women’s separatism as a smoke abatement tactic. According to one LHPA leader, “after five years the Health
Protective Association began to feel that its mid-Victorian name was out of date and its somewhat mid-Victorian methods out-grown.” According to an official history of one of its descendent organizations, in 1894 the LHPA took on a new identity as the Social Service Committee of the women-only Twentieth Century Club. Yet in December of that year, the group had signed their petition to the Select Council as the LHPA. On October 8, 1895, the mixed-gender Civic Club of Pittsburgh was formed out of the Social Service Committee of the Twentieth Century Club (formerly the LHPA) in combination with members of other women’s organizations and male allies. Women and men shared club offices (albeit unequally) and, like its two ancestor organizations, the Civic Club worked with state and local governments to implement its agenda of municipal improvement.

Smoke was an important topic at the first Civic Club meeting in October 1895. The Social Science Department of the Civic Club continued to work on the smoke question, on which, they noted, there had been some improvement, yet the smoke remained “very burdensome and annoying.” In April 1897 the Civic Club appointed its first smoke abatement committee which, notes its early historian, after “accepting an invitation to inspect certain plants was either so discouraged or encouraged that it ceased operation immediately thereafter.” Former LHPA members, as Civic Club activists, would become increasingly disenchanted with the lack of enforcement of Pittsburgh’s smoke ordinances. They temporarily gave up on smoke in disgust. In the mean time, Pittsburgh’s Chamber of Commerce, the organization to which anti-abatement councilman Hugh Ferguson had wanted to refer efforts to solve Pittsburgh’s smoke problem, became interested in smoke at the urging, as we will see below, of Andrew
Carnegie. It was at the request of the Chamber of Commerce that the Civic Club formed a new smoke abatement committee in 1899.

While these developments unfolded in Pittsburgh, residents of Allegheny were conducting a similar attack on both locomotives and stationary boilers. In June 1897 (effective December 1897), Allegheny City had passed its own new smoke ordinance. This ordinance prohibited all smoke discharged from both stationary and portable boilers. It did not specify that the smoke had to be of a certain density or be emitted for a certain length of time. In including portable boilers, the ordinance included locomotives. It required enforcement of the ordinance in all cases and instituted jail time of from forty-eight hours to ten days in addition to fines as the penalty.224 Allegheny residents had gone beyond efforts made in Pittsburgh to impose stiff penalties for smoke-making. As we will see below, this ordinance does not seem to have been effectively enforced.

3.9 Andrew Carnegie and William Metcalf: Coal, Smoke and Pittsburgh’s Future

In the midst of the smoke debates of the 1890s, Pittsburgh’s economic future was in question as much as was the state of its atmosphere and the choice of fuels and combustion technologies. These issues would be explicitly linked by players including Andrew Carnegie, William Metcalf and the Pittsburgh Chamber of Commerce. In 1899, Andrew Carnegie addressed the Chamber about manufactured gas as a solution to Pittsburgh’s smoke problem and to a looming crisis in industrial competitiveness. We have seen in previous chapters the intensity of experimentation with fuel alternatives and the way in which decisions about fuel were intertwined with questions of urban identity and prospects. Carnegie’s speech and responses to the attitudes he expressed make this
all the more clear. Carnegie hoped that Pittsburhers’ inventiveness would solve the central problem of Pittsburgh’s economic competitiveness. He portrayed navigation improvements on the Ohio River as a weapon to protect Pittsburgh’s presumably embattled industrial supremacy. “When we have the Ohio navigable at all seasons, Pittsburgh will have a weapon which may be trusted to keep her pathway clear, and her supremacy firm over the entire region watered by the great western rivers.” Carnegie praised Pittsburgh’s progress “in things not material” and this is how he introduced his discussion of “the smoke nuisance” which turned into a discussion of the building of a manufactured gas plant:

... may I now pass from material things to congratulate you upon the advance which Pittsburgh is making in things not material, but which are improving Pittsburgh as a residential city. The magnificent parks and coming boulevards, the zoo, the golf links, the conservatory, halls and hotels, picture galleries, libraries and orchestra all tell the story of wonderful advance unequaled, as far as I know, by any other city in so short a period. We all know that many of our citizens are tempted just at that period of their lives when they could be of most use to our city in furthering things of a higher order to leave Pittsburgh to reside under skies less clouded than ours ... The man who abolishes the smoke nuisance in Pittsburgh is the foremost of us all ... Is there no Westinghouse or Brashear among us to work the miracle of our salvation from this nuisance.225

Carnegie lamented that “natural gas is going; the supply becomes less and less.”

Perhaps Carnegie’s response to Pittsburgh’s appearance after the natural gas period is the best test we have of claims made in the 1890s to smoke abatement success. Carnegie spoke of reading of smoke ordinance prosecutions in the Pittsburgh newspapers. From this he expected improvement and was disappointed: “I have read of Mr. Bigelow’s immaculate pumping station. My partners have cheered me upon the Carnegie building being smokeless, and I came here prepared to see manifest signs of improvement ... ” But Carnegie did not find them. He counseled “prevention” rather than
“cure.” Prevention was to take the form of “gas ... produced from our coal at the mines and supplied to homes in Pittsburgh in place of natural gas for all purposes.” Carnegie, however, had directly compared the cost-effectiveness of manufactured gas and coal in his own Pittsburgh mills in May 1891 and decided in favor of raw bituminous. Yet he had also made a considerable investment in a mill to be run on manufactured gas in Bellefont, Pa. in 1892.226

Carnegie claimed that investment in smoke abatement would be paid back one-hundred-fold.227 Carnegie discussed the successful use of manufactured gas in Glasgow but noted that “the cost of coal in Glasgow is twice what it is to you.” Carnegie meant by this to point out the relative cheapness of making coal gas in Pittsburgh, but it naturally also suggests a greater cost differential between raw coal and all other fuels in Pittsburgh.

Carnegie urged:

If I were czar of Pittsburgh, or permanent boss (which is almost as good) I should call together a commission of Pittsburgh’s able, well-known citizens. The president of Carnegie Institute at my side would make an excellent president of the commission, and I should have Mr. Bigelow and Prof. Brashear. I should harness Mr. Westinghouse (being czar I could make that giant do as I wished), Mr. McConway should put on, my partner, Henry Clay Frick, would get an order, and also Andrew Mellon, that longheaded scot. My cousin, Mr. Lauder, should certainly be on the commission. He has a wise head, scientific knowledge and sound judgement ... 228

The purpose of the commission was to:

Consult the experts, purchase a vast field of coal on the river, lay down the plant that will most economically make gas, distribute it to the city, and sell it to the households of Pittsburgh, from the lowest to the highest, and to small manufacturing concerns at such rates that it will be as economical, all things considered as the use of raw coal.229

As we have seen in previous chapters, industrialists, in the long run, would not judge manufactured gas to be their most profitable fuel option. Carnegie foresaw such problems
and suggested public-spirited action, proposing that the city pay the initial deficit for run up by a fledgling manufactured gas industry with public funds. He was confident that the operation would not run a deficit for very long. Carnegie proposed this as “something for the Chamber of Commerce to hammer at instead of the canal, my panacea of former years.”

Carnegie’s reference to the canal highlights his longstanding view that Pittsburgh’s industrial supremacy could not be guaranteed. The advantages of geographical position were not absolute in a world where local caches of natural resources could be completely exhausted and distant new sources unearthed and in which routes of trade and communication were determined as much by technological enterprise as by pre-existing natural features. Apparently Carnegie had found it possible to improve upon Pittsburgh’s “ideal” situation in industrial geography. Such concerns had been made more urgent by the development of steel centers to the west and south.230 Unintentionally he underscored this point: the canal (to bring iron ore from the great lakes to Pittsburgh via the rivers) had long been superceded by cheap railroad transport. Enunciating a view that would become more and more common throughout the century to come, Carnegie remarked that:

> At several stages in my career I have been informed by wise people that Pittsburgh had lost her grip, but I have always felt that the proper response to make to these pessimists was to take a firmer grip of her than ever, Pittsburgh is all right, and if anyone thinks her grip is lost, I am not that man.231

Despite protestations about his love for the city – “where your treasures are the heart will be found also, and you all know where mine lie, for I have put all my eggs in one basket, and am sure to keep a wary eye upon that basket” – Carnegie went on to make excuses
for not living in Pittsburgh, citing the advice of his physicians that he spend his time in seaside relaxation.  

William Metcalf had recently addressed connections between Pittsburgh’s industrial future, fuel choice and Andrew Carnegie’s view of the city in the trade periodical of the iron and steel industry The Iron Age. Metcalf’s views are a coherent articulation of associations between traditional republican and producerist values with bituminous coal and its smoke. These values underpinned his faith in the city’s continued industrial strength in the face of new technological developments understood largely as threats to the city’s fundamental identity. Metcalf’s January 1896 article was titled significantly “Pittsburgh As an Iron Center” – not an “iron and steel center.” He portrayed Pittsburgh as the “Iron City” and the “Glass City” “though she has neither iron ore nor glass sand in her borders, nor within so many miles.” With this he directly took on the point, raised by Carnegie, of Pittsburgh’s threatened industrial supremacy, now that the preferred source of iron was not in the nearby Alleghenies but on Lake Superior’s shores. Despite its distance from sand and iron ore, Metcalf referred to Pittsburgh’s “unrivaled location” presumably because the city was at the Forks of the Ohio. Yet with the end of the Ohio Valley migration, the advent of rail transport, and the change in location of iron ore supplies, it was difficult to maintain this basis for such a distinction. Instead, Metcalf pointed to coal: “the great Pittsburgh coal seam makes her supremacy as a manufacturing center safe ... Pittsburgh coal is unrivaled in quality, in quantity and in cheapness. Within 50 miles, the great Connellsville seam provides a coal that makes the best and the cheapest coke in the world.” A special relationship to
bituminous coal was the key to Pittsburgh’s maintaining its historical industrial

dominance.

Metcalf saw new forms of energy as a threat to Pittsburgh’s character:

All around her petroleum is found in great abundance, and natural gas in such
unlimited quantities that for a few years she was known as the beautiful Gas City;
thousands of people flocked in to take advantage of this gas, and the staid, solid
old place came near to being degraded into a common boom town with a
mushroom growth. By the most vigorous energy and by the most astounding
wastefulness, this steady, thrifty, conservative old Scotch-Irish town soon
dissipated this ephemeral monstrosity of fuel, and once more we are under our
good old cloud of smoke and plodding along in our grime and ashes.234

He lamented the wastefulness of gas use and connected it to unrestrained economic
growth and a violation of traditional local values. Metcalf saw return to coal as the savior
of Pittsburgh’s character and economy.

Are we penitent, sorry for this outburst of extravagance? It is doubtful: it is not
clear that the gas brought any lasting benefit or even much temporary benefit to
Pittsburgh. If we were extravagant in its use when we had it, we were absolutely
riotous in our rush to give away every cent of profit there was in it. As soon as a
man got the first gas jet into his mill he rushed out to the rest of the country and
downed his prices in hope of extending his business and of gathering in some
other fellow’s trade: it is an every man for himself community, and very little of
the benefit of natural gas remained in it. This rush soon exhausted the surplus of
gas; it costs something now to use what there is, and we are going back to coal;
we are on a solid foundation again; we know what coal is, we know what to do
with it, we know how much there is of it and we can again pursue the even tenor
of our way with no fears of the future.235

Metcalf also celebrated the Pittsburgh’s glass industry and took coal as the key to it – but,
ironically, glass was soon to follow the natural gas industry westward.

The only other industry Metcalf discussed, he presented by way of contrast to
iron, steel and glass. He acknowledged that smoke inhibited economic diversification and
regarded this as perfectly acceptable. He connected damage to “delicate” manufactured
goods by smoke to similar smoke damage to domestic goods like laundry on the line. He
referred to Pittsburgh’s current controversy over smoke as a conflict between men and women, repeating gendered characterizations of environmental attitudes from mid-century.

In early days there was much and successful cotton manufacturing here; now there is none. Even if the genius of the people trended in that direction of such fine and delicate manufactures, it is safe to say that the all prevailing soot would drive any one crazy who persisted in trying to produce snow white goods in such an atmosphere. The much suffering housewife counts herself happy if she can hang a line full of linen outdoors to dry on one or two days in the year. Is this smudge necessary? The men say yes; the ladies say no. The contest is being waged vigorously, and time will show which side is right.236

Metcalf held both the old views of smoke and the old republican and producerist views of labor.237 Metcalf agreed that there had been “plenty of strikes and stubborn ones” but he insisted, in republican and producerist fashion, that the person who assumes that the men who work our great mills are any more apt to want to destroy them or injure them in any way than are the owners of the mills, is, so far as our community is concerned, an ignoramus ... There are but two classes of people in the world, workers and loafers. The workers, rich and poor alike, maintain the community and the world. The loafers, rich or poor, are about the most useless things in nature. Pittsburgh undoubtedly contains more workers to the idler than any place of its size on the continent; and workers are builders and not destroyers.238

Much of the point of Metcalf’s article was to argue that Pittsburgh was a safe place in which to invest. He took up the challenge of industrial competition from other locations explicitly.

... it is a good safe place to invest money in, unless a person wants rapid and extravagant returns ... But is Pittsburgh the best place, the most economical in which to produce pig iron and the iron and steel which are made from it?239

Andrew Carnegie’s doubts about Pittsburgh’s future figured prominently:

Our largest manufacturer and greatest philanthropist, Andrew Carnegie, says no; there are other places where pig iron can be made cheaper than here, and that Pittsburgh has lost her supremacy in this great industry. He urges the community
to use every effort to build a ship canal in order to cheapen transportation and restore to Pittsburgh her lost place. This is wise, whether pig iron can be made cheaper elsewhere not, it is clearly eminently wise to strain every energy toward cheapening means of exchange, even if those existing are better than any others.240

But Metcalf questioned Carnegie’s doubts about Pittsburgh, given his continued industrial presence in the city. It was with this discussion of Carnegie’s doubts that he concluded his article and refuting those doubts seemed to be the article’s purpose.241

3.10 The Chamber of Commerce Committee on Smoke Abatement

The appointment of a special committee on smoke abatement in January 1899 was a result of Carnegie’s address. Chamber of Commerce and Civic Club histories credit this committee’s efforts for the eventual passage of a more effective smoke ordinance in 1906.242 In January 1899 the Chamber of Commerce Committee on Smoke Abatement (5 members) asked that the Civic Club work with it to get a new smoke ordinance enacted.243 The committee’s final report emphasized smoke’s damage to the city’s landmarks and to commercial interests, both of which had become economic matters perhaps as serious as industrial supremacy.

The smoke has become such a nuisance in our City as to call for some very decided action, at least if we hope to claim for Pittsburgh the double advantage of its being a good place for business as well as an attractive place to live in ... It is, in short, a prospective condition which the businessmen and owners of real estate in the city, with millions of dollars invested in goods on their counters, and other millions invested in the decoration of their homes, should not tolerate.244

The committee praised Bigelow’s parks and boulevards and Carnegie’s promotion of the arts in Pittsburgh but said: “if excursionists must provide themselves with lanterns and procure the services of guides, it is to be feared that their beauty and magnificence will
have to be set down with other things ‘which eye hath not seen,’ though the ear may have
heard something about them.” The report lamented: “Smoke is something that appears to
grow in a ratio faster than the growth of our population.”

The report called for industrial diversification and saw smoke as an impediment to it:

We want manufacturers of light articles to locate among us, as they do in every
other great city, and thus more greatly diversify our trade and extend the name
and influence of the city over a greater radius, but they do not come, and the
reason is not far to seek.245

The report lamented the lack of “notable success” of the city so far in abating
smoke and ascribed this to “the absence of laws for the enforcement of the city ordinance
for this purpose.” This, despite the 1895 reforms that “directed” rather than simply
“empowered” officials to enforce the law. The Chamber committee believed that it was
possible to “greatly diminish the smoke nuisance throughout the commercial and
residence districts of the City” through “better education of the public to the necessity of
more stringent enforcement of regulating ordinances by the city officials.” Yet the report
blamed public indifference rather than “dereliction of duty by the city officials” for the
lack of ordinance enforcement. It acknowledged that there were no foolproof smoke
prevention technologies, but several worked well at producing only a minimum and non-
objectionable level of smoke if “intelligently handled” and would offer some fuel
savings. In concurrence with previous Engineers’ Society conclusions, the report claimed
that the “undue urging of boilers is the principal cause of smoke.” Most of the boilers in
the business section of the city were too small for the jobs they were required to do,
especially those in “office buildings, warehouses, wholesale stores etc. “mostly because
there is not enough space for bigger boilers in building basements. No smoke abatement
devices would work under these conditions and more expensive smokeless fuels like “oil, 
gas, coke and anthracite” would be the only remedy. The committee urged that the
greater cost of smokeless fuel “should not be an impediment to the efforts of ridding this 
community of an almost intolerable nuisance.”

In the four years since the Engineers’ Society committee had delivered their 
report, the domestic fuel situation had stabilized. The Chamber’s report now claimed that 
few households “within the business portion of the city” used coal but instead relied on 
the remaining supply of natural gas. Therefore, domestic smoke need not be a major 
smoke-abatement consideration. Supporting the view put forward in the Engineers’ 
Society in 1892, the Chamber’s committee contended that “smoke issuing from the boiler 
stacks of office buildings, hotels, warehouses, stores and manufacturing establishments in 
the heart of this City, is more of a nuisance than all the smoke produced by the various 
Carnegie plants.”

The report argued that installation of adequate boiler capacity or use of alternative 
fuel would “very much lessen the waste of goods exhibited in stores and windows, 
furniture, clothes and last, but not least. it would very beneficially affect eyes, throats and 
lungs of the people and greatly contribute to their general comfort, pleasure and 
happiness.” The Chamber’s report acknowledged that abatement would always mean that 
some people will be put to some expense and inconvenience, but it is only 
reasonable that such expense and inconvenience should fall upon those who cause 
the evil, and not upon their victims. There will always be found individuals who 
will insist that, unless they are at liberty to make smoke at their pleasure, they will 
be ruined. Such protestations have to be ignored or the contemplated reform will 
ever materialize.
The Committee recommended to the Chamber that it should “influence the next Legislature” to enact laws allowing the city not only to mandate installation of smoke abatement devices in response to stack violations but to require increased boiler capacity or fuel change if no other means could be found for ordinance compliance. Presuming the technology was indeed adequate to address industrial and commercial smoke, the committee put great faith in ordinances: it claimed that New York City had no smoke simply because ordinances forbade it.

The committee articulated a new justification, based on the nature of smoke and soot and on the location of large industrial plants, for concentrating abatement on commercial rather than heavy industrial properties. It concluded that

> abatement of smoke for sources in the heart of the city is of more pressing necessity than that from the more distant industrial plants, for the reason that the greater portion of soot always drops in the vicinity of its source, therefore the smoke for establishments located at greater distances darkens the sky, yet it is much less offensive and polluting than that produced in the central section of the city.\(^\text{249}\)

This approach would minimize smoke in the Central Business District, of supreme importance to the Chamber of Commerce. It would, however, leave both elite East End residents, whose neighborhoods bordered mills set along the rivers, and the large worker populations who lived next to the outlying mills in which they worked, still vulnerable to smoke and soot. Yet no solution that attacked the mills directly was politically tenable – and the report, like reports and legislation preceding it, concluded that “most attention must be given to the suppression of smoke from boilers, because either the combustion of fuel does not take place at so high a temperature as in a heating furnace, which accounts
for the greater difficulty encountered in the endeavor to prevent the production of smoke from that source.”

The committee argued that for steel works and “other large manufacturing establishments” having enough steam generation capacity and the best mechanical stokers would solve the smoke problem. The committee argued that for heating and other furnaces (in metals industries) use of producer gas rather than direct firing with bituminous would be best, but it added that “the temperatures of all such furnaces must be regulated according to the requirements of the various stages of the work.” With coal, such temperature regulation could only be conducted by admission of additional air and therefore through production of smoke. Instead, the report claimed, “the rational method is to govern the fuel supply, and this is much easier accomplished with gas than with coal, because regulating the flow of gas will bring forth the desired result.” It recommended that with producer gas and regenerating systems “the black smoke from heating furnaces of all kinds could be entirely prevented.”250 As we have seen, however, experiments were made on the efficacy of such systems in Carnegie’s own mills in the early 1890s and manufactured gas was rejected in favor of raw bituminous. Without further technological improvements of the sort that Carnegie indicated, no such system would be adopted in Pittsburgh’s mills. In the end, but only in the end, the committee took up the solution Carnegie proposed in the address that had prompted formation of the committee. The report said that “the eventual solution of the smoke problem” would be “converting coal into gas” and that “the advent of this desirable state will be hastened by the restrictions imposed on the production of smoke.” As we have seen in previous chapters, there was significant experimentation with manufactured gas in Pittsburgh at
the end of the Natural Gas period, but eventually this avenue was rejected as insufficiently profitable.

3.11 Early Claims of Progress and Consensus: The Joke that Wasn’t Funny Anymore

Despite Carnegie’s disappointment with smoke abatement progress in late 1898 and early 1899, by the first years of the new century it was clear that some real effort was being made to enforce smoke ordinances. The important technical issues relevant to smoke abatement had become familiar enough to newspaper audiences that the problem of smoke abatement could be divided into cases and different technical solutions proposed for each. The Pittsburg Times ran a series of front-page stories on such questions for an entire week in May 1900. The series attempted to show that smoke abatement was possible under all circumstances, even those acknowledged to be difficult at the Engineers’ Society and in the Chamber’s report. The paper continued to showcase governmental experts, as one would expect given its machine sponsorship. It did not, however, seem to respect the political consensus that had limited action against smoke to regulation of non-industrial producers. Instead it covered operations at industrial plants, large and small, and sought to show how well they were doing with their boilers. Some of its interviews with smoke abatement experts even touched on regulation of metal furnaces, rather than boilers – a kind of smoke regulation that would remain contentious for the next decade and a half. The articles addressed many of the objections to smoke abatement raised in the Engineers’ Society meetings of 1892 and took up recommendations put forward by the Chamber of Commerce committee the previous December. Smoke Inspector Brennan used the articles to advertise his work. He also used
them as a platform from which to argue for more stringent smoke regulation than the Magee-Flinn machine had so far allowed.

The Times campaign, while perhaps covertly driven by new interests in economic diversification and consumer values, would speak the language of the more narrowly defined economic interests of the smoke makers themselves: fuel cost saving through greater combustion efficiency. Arguments such as those made by the Times were particularly weak in Pittsburgh: coal in the city was unusually cheap and while some cost saving would result from fuel economy, it would be less dramatic than in places where fuel costs were higher. Occasional reference to the other motivations for smoke abatement in some of the articles was evidence of limited recognition of the ultimate inadequacy of the rhetoric of fuel economy alone.

The first article began with a two-pronged attack on smoke – the first expressed in quotations from smoke inspector Brennan complaining about the leniency of the current ordinance, and the second showing a successful example of smoke amelioration. The city’s Brilliant Pumping Station, celebrated for its smoke abatement success but criticized for failing to make enough improvement, continued to employ smoke abatement devices. Director of Public Works Bigelow cited preservation of Highland Park as a chief motivation and the chief engineer at Brilliant remarked that “to defile the breathing spot of so many would be inexcusable.” It laid the groundwork for the subsequent features by explaining the chemistry of combustion and by describing a situation where smoke abatement was undisputedly easy. Brilliant possessed adequate boiler capacity to do the work required of it and the demands of that work on the boilers were unvarying. Both these conditions were put forward by critics of smoke abatement as pre-requisites for its
successful practice. In featuring the Brilliant pumping station first, The Times both allowed the municipal government to appear to be in the vanguard of smoke abatement and chose a case in which few were likely to express doubts that smoke abatement was a reality. Presented here as an easy case, Brilliant, in reality struggled for over a decade to improve its smoke profile.  

Subsequent articles went on to present less “easy” examples of smoke abatement. The next two articles discussed smoke abatement efforts at large iron and steel mills: the Jones and Laughlin American Ironworks on the South Side and Andrew Carnegie’s Homestead Works. The Times described the smoky spectacle of the American Ironworks:

the spectacle presented when the boilers have been freshly fired is one of the most impressive to be seen in any manufacturing region in the world ... clouds of smoke ... roll away from the tops of the stacks that the whole territory of Oakland and SoHo are buried under the thick black waves of soot ... the stacks stand high in the air like a regiment of fiends from the lower region keeping guard over the caves of darkness ... .As the fires are replenished it is not difficult to imagine that the portion of Pittsburg at least is immediately above the doors of the inferno ... That lurid spectacle is worth going some distance to see before it is abolished forever.

The paper asserted that “one glimpse of that explains all of Pittsburg’s remarkable supremacy in manufacturing.” Smoke was still a sign of industry, yet, it was not its necessary accompaniment. The Times here implicitly rejected the view – embodied in the 1892 and 1895 smoke ordinances – that boilers in downtown office buildings used to run elevators were the most important source of Pittsburgh’s smoke to regulate. The paper asserted that if one compared Jones and Laughlin’s daily coal consumption to the coal consumption of the city as a whole, it was such a significant proportion that: “it will be seen that it is absolutely useless for the small boiler plants to labor for the prevention of smoke unless the big plants like the American Ironworks strive for the same ends.”
Unlike those who debated in 1892, the paper did not, by 1900, display a hands-off attitude toward Pittsburg’s essential and characteristic industries.

The article turned the image of the smoky office building on its head and used it in an argument that smoke abatement in large industries was indeed possible. The new Jones and Laughlin plant was projected to “make less smoke than some of the single stacks down in the city that have nothing more to do than run the elevators and drive the little engines of an office building.” In January 1900, Jones and Laughlin had installed a boiler equipped with an automatic stoker that passed combustion gases over the hot coals before they were allowed to escape. They were engaged in large-scale renovations aimed at increasing capacity of the plant and the new boilers added had improved smoke emissions. The Times quoted the chief engineer at the ironworks as saying that financial savings, both of fuel and of labor costs and smoke abatement were twin goals. He cited economic factors as “the first thing the maker of iron must figure on” and said that “if wasteful methods will evaporate more water in a given time, wasteful methods must prevail.” It should be noted, however, that it was steam boilers for power rather than blast furnaces or heating furnaces that were being run with smoke abatement in mind at Jones and Laughlin. Like the Brilliant Pumping Station, the American Ironworks was presented as something of an “easy case” since its smoke abatement improvements were made possible only by the installation of new equipment carefully planned to use fuel efficiently. The Times went on to discuss cases where smoke abatement could be accomplished without the resources available to such industrial giants.

The next article in the series concentrated on the smoke abatement prospects of such “little sinners” and highlighted the Epping-Carpenter Company which made pumps
that had to be tested by connecting them to the company’s power boilers. This periodically increased the load on the boilers tremendously and would normally have meant “extraordinary agitation of fires” to get up steam quickly, and thus a great deal of smoke. David O. Thomas, the chief engineer of the plant, gave The Times a demonstration of such a test in which the steam gauge showed the quickly increased steam production and still very little smoke resulted. The smoke produced did not last thirty seconds, let alone the three minutes allowed by the current ordinance. The engineer saw the solution to the smoke problem in greater knowledge of the theory of combustion by plant owners and by those in charge of fires. He claimed that he had had doubts about the system they now employed – an automatic stoker feeding coal under the fire so any vapors produced during the temperature lowering at feeding were consumed as they moved up through the fire. He wondered if the practice would live up to the theory, but was, in the end, utterly convinced. The paper gave names of other plants in Pittsburgh with similar systems in use.253

Like Epping-Carpenter, Consolidated Ice presented a difficult case for smoke abatement. At Consolidated Ice the boilers and the boiler layouts were old and had been constructed without regard to fuel economy. The boilers themselves were overcrowded. This was a problem for many of Pittsburgh’s businesses which were growing beyond their boiler capacity. Yet, although the city ordinances allowed for three minutes of smoke at any one time, Consolidated Ice did not emit smoke for more than 30 seconds at once, and then only when the grates were cleaned. They used automatic stokers and claimed a 30% fuel savings over hand-firing. In addition, the mechanical stoker allowed them to use any kind of coal from lump to cheap slack.254
All the articles viewed mechanical stokers as the solution to the smoke problem—and the next article in fact argued that smoke abatement was a lost cause with hand firing. This mechanization of fire-tending accorded well with the mechanization of all aspects of production in this era. The next article urged the use of mechanical stokers and their substitution for common laborers as firemen and engineers. W. E. Snyder, in charge of the Schoenberger Mills, was the first interviewee in the series of articles to call for the use of mechanical stokers for metal heating furnaces rather than just for steam boilers. His plant used many stokers as well as waste gas from blast furnaces and he was ready to install stokers in the entire plant.255

The next article appears to have been composed to meet objections about the difficulties of obtaining the skills or the skilled workers that earlier articles suggested would be essential to smoke abatement. Its headline was “Any Man Can Run This One – All the Judgement Needed Is Enough to Put Coal on the Fires – Smoke Suppressed in Eight Seconds.” The Times received a call from the operators of a saw mill who claimed to be using a device there to abate smoke from a combination of wood and coal that could be run by anyone. They demonstrated the device to reporters and after making a smoky fire, turned on the device and abated the smoke in 8 seconds. They claimed that “it does not matter whether the man who tends it is a genius or a clod ... unless he tampers with the air and the steam pipes, he cannot make smoke if he wants to.”256

Articles claimed great success at smoke abatement for Pittsburgh and asserted that, even at this early stage that Pittsburgh, with more than 300 boilers in the city installing smoke preventors in the two years of the existence of the Smoke Inspector’s office, was “bothered less by smoke than Chicago, Cleveland, St. Louis and other cities
where soft coal [was] the fuel ... ” A later article claimed that 95% of Pittsburgh’s smoke could be prevented by such means. It also claimed that Pittsburgh was not “as smoky as it has been in the past” and that “it would be a mistake to suppose that it is as smoky as the increasing consumption of soft coal would suggest.”

The time never was in the history of the city when so many boilers were making so much steam and driving so many wheels. But much money has been spent in the past 10 years in equipping boiler plants for the economical consumption of coal ... all of it working toward the one end sought until what was theory had become a simple practicality and the prevention of smoke is with the enlightened engineer a matter as well understood as the utilization of the expansive forces of the steam his engine uses.257

The paper calculated the loss due to coal waste to the city as 20% and explicitly acknowledged that “the secondary cost, which comes in the damage to buildings to furniture, to goods and to every thing that is subject to the influences of smoke” would add to this economic loss.258

In its final two articles The Times provided an overview of progress against smoke in Pittsburgh.259 It repeated the theme of the aerial view of the industrial spectacle introduced in early articles. In these summary articles, however, it argued that much progress had been made and that smoke arose from “segregated spots” only and that while it was blown by winds around the city, “gradually ... soot settles out so that the worst part of the smoke is confined to a circumscribed area. The vicinity of the boiler that makes it is the principal sufferer.” The whole series of articles was published in May, the season when Pittsburgh’s smoke situation was neither made worse by winter heating, misty air, nor summer temperature inversions. The paper claimed that “dwelling house chimneys are at this season quite inoffensive” and
the business part of Pittsburgh or the portion bounded by Try Street and Thirteenth Street does not make much smoke. The greater quantity comes from the narrow territory along the rivers above the streets mentioned. The vast region from the court house eastward, as far as the eye can reach, is almost barren of offense, except in the narrow strips of ground that border the streams ... Here and there will be seen a cluster of stacks the equipment of some large industrial plant, that give off no smoke. Some are fired with gas, some fitted with smoke preventing devices. Perhaps in the midst of a number of unoffending stacks will be seen one that is vigorous in its abomination ... From the eminence can be seen the origin of the clouds of smoke.260

This statement explicitly acknowledged that the areas of the East End exempted from the 1892 ordinance (between the Allegheny Valley Railroad tracks and the Allegheny River and between Second Avenue and the Monongahela River) were the most important areas of smoke production in the city. The current (1895) ordinance regulated boiler smoke but not furnace smoke in such areas. Nonetheless, the paper boldly asserted:

Smoke is doomed in Pittsburgh. When the agitation against smoke was commenced, the movement was looked upon as a farce and many intelligent men insisted that to stop smoke would be to stop the mills. The man of ordinary observation knows better than that now. The matter has been argued and investigated so much that how to burn coal is one of the best understood theories in the practice of the boiler room.261

Smoke inspector Brennan celebrated progress against boiler smoke throughout the city. He claimed that 30% of Pittsburgh’s boilers had smoke preventors and that he hoped to see them on 70% of boilers within the year. “People cannot afford to do otherwise,” he asserted. Brennan gave credit to Public Works Director Bigelow for being motivated to support smoke abatement by a desire to protect Pittsburgh’s parks. Brennan spoke triumphally:

Slowly the smoke crusade evolved. By many it was taken as a joke, and the idea of freeing the city from smoke was ridiculed. But the invincible power was at work. Men were learning that they saved money by burning their smoke and the project spread from one mill to another. It entered the small plants along with the
big ones and as the possibility of making money by saving smoke is better known
smoke will be utilized.\textsuperscript{262}

The idea of smoke abatement as a “joke” or a “farce” reflects the attitude
expressed by many at the Engineer’s Society meetings in 1892, in the newspaper
editorials of 1871, in the tongue in cheek tone of James Parton’s 1868 feature and even in
the \textit{National Labor Tribune}’s coverage of the Ladies Health Protective Association. What
Brennan did not comment on here was the dependence of this humor on the gender and
class characterizations of those interested in the cause. Parton poked fun at dandies and
frivolous young girls, and the 1871 editorial ridiculed Huckenstine’s neighbors as
aristocratic gentlemen. Men at the Engineers Society ridiculed the LHPA members’
assumed concern for their complexions and the \textit{NLT} was amused by the incongruity of
upper class ladies, who should have been impractical, frivolous and sentimental engaging
in such “business-like” activism. The change Brennan observed was a change in the
acceptability of the values previously regarded as both feminine and aristocratic – and
hence as anti-republican. Over the next several decades, growing anti-smoke sentiment
would rest on the dismissal of older notions about the relation of gender and class to
environmental amenities. It was due to such changes that smoke abatement became, by
1900, a joke that had lost its humor.

Emboldened by his perception of anti-smoke consensus, Brennan argued for more
rigid ordinances, with the time limit for smoke-making cut from 3 minutes to 1 minute at
any one time and for more staff for his office. He also wanted to license and register
engineers and firemen and to approve all plans for new construction or modification of
combustion equipment. He addressed the problem of metal heating furnaces directly
saying they “will make a little [smoke] at certain stages of heating metal.” Brennan regarded smoke from all other sources as eminently remediable. He did not see domestic smoke in Pittsburgh as an issue worthy of the diversion of attention from industrial smoke. Brennan examined such diversionary arguments when he compared the domestic smoke situation in Pittsburgh with that in London: London had 10 times Pittsburgh’s population and consumed only 1 ½ to 2 times the coal. Brennan argued from this that, while there were devices that could and should be used to abate domestic smoke, in Pittsburgh the industrial problem swamped the domestic one:

From this it is argued that the dwelling houses of London make much of the smoke with which the city is afflicted ... In Pittsburgh it is estimated that not more than half of the houses burn coal for fuel and the larger houses are those that burn gas, the coal fires as a rule being confined to the smaller houses.  

The paper also described the contribution of natural gas and gasoline engines to smoke abatement but argued that in Western Pennsylvania, because of the importance of coal, smoke abatement must concentrate on better ways to use soft coal – “still the fuel that Western Pennsylvania offers to the World.” It continued: “To prevent smoke by using another fuel than coal would be to condemn the fuel that affords a large part of the revenue of the community and [is] foreign to the question.” Brennan also asserted that locomotive and steamboat smoke would not be much of a problem when the steam boilers and stationary steam engines were dealt with.

The paper summed up its series by pointing to the abundance of devices for smoke abatement and to its just-offered proof that many were effective. It reported on Smoke Inspector Brennan’s work in bringing 125 complaints against smoke offenders and his claim that such complaints were usually satisfactorily resolved before they went
to court and that they gave good results by influencing others. Brennan looked forward to the day when “it will be looked upon as a willful lack of public spirit and good citizenship for any man to maintain a smoke nuisance just as it would if he maintained any other nuisance.” He boasted that just as “the soft coal consumed in the city is increasing every day ... Pittsburg is approaching the conditions of a smokeless city and is farther along in that direction than most people imagine and making more rapid progress.”

Brennan and his supervisor Bigelow may well have had a commitment to smoke abatement that went beyond Magee’s interest in it for its public relations value. Public Works Director Bigelow, while installed by the machine, chafed at its control. He had undertaken large projects, like the creation of Schenley Park, independently of the machine’s direction. Bigelow was not just Magee’s man. Because of his independence, Bigelow would be forcibly ejected from his City Hall office and lose his post. He would eventually form an alliance with Magee-Flinn enemies in Matthew Quay’s state machine that would result in the temporary elimination of the Magee-Flinn machine from control of Pittsburgh politics. Brennan, when he left office as a result of the action of the legislature to turn out all of the existing administration in 1901, became superintendent of power stations for the traction company that was Magee’s chief competitor and which would engineer a hostile take-over of Magee’s firms after the boss’s death.

Even if the claims of the Times articles about the ease of smoke abatement were overblown, it is clear that Brennan, and his two assistant smoke inspectors, had been responsible for some real smoke abatement efforts in the city. During his entire tenure he claimed to have “brought about 250 suits for violations of the ordinance,” which had
generally been “settled by the offenders complying with the law or making a sincere effort to do so.”268 The Gazette Times in 1906 indicated that by 1897 “a rigorous effort” had been made to enforce the 1895 ordinance and “satisfactory progress was being made by the inspectors.”269 Finally, though, when Brennan brought a furniture manufacturer to court, the law would be overturned. Whether or not one accepts the newspaper’s overall assessment of smoke abatement progress in these years, the overturning of the 1895 smoke ordinance is evidence of some enforcement. The ordinance could not have been overturned if it had remained completely unenforced.270

3.12 Overturning of the 1895 Ordinance

In the year after Brennan announced that smoke was “doomed” in Pittsburgh, the 1895 smoke ordinance he had used to threaten the 250 violators with court proceedings and fines was declared invalid. In October 1899, the bureau prosecuted William H. Keech, “the pioneer and most successful operator in the installment furniture business in Pittsburg ... whose advertisements [had] made his name familiar to every man, woman and child in Western Pennsylvania,”271 for violation of the smoke ordinance. Smoke ordinance prosecutions were taken up in Pittsburgh’s Aldermanic Courts. The aldermen were elected on a ward by ward basis and were to handle “practically all the minor civil litigation” of the city including “all the preliminary matters connected with criminal prosecutions.” Aldermen “issued warrants for arrest, held hearings and committed the accused to jail, unless bail was allowed.”272 Alderman Toole fined Keech twenty-five dollars and court costs. In February 1901, Keech appealed to the Allegheny County Court of Common Pleas. The jury in the case ruled against Keech but Judge Stowe entered a
decision non obstante veredicto for Keech and against the city. Judge Stowe held that “the section of the ordinance declaring the emission of black or dark gray smoke to be a nuisance was not effective to make a nuisance that which was not one in fact” and that the whole ordinance was unreasonable because it regulated only boilers smoke and because “the enforcement of such an ordinance would be impractical, not to say impossible in present conditions ...”

The city then appealed to the Superior Court of Pennsylvania in April 1902 and the Superior Court affirmed the decision of the Allegheny County Court of Common Pleas in December 1902. Superior Court Justice P. J. Rice was “not prepared to commit” himself to the view that the ordinance was “unreasonable or unconstitutional” or “that it would transcend the powers possessed by the city.” In this way he sidestepped issues of discrimination and impracticality raised by the Common Pleas decision. Unlike the lower court, he did not reject the denomination of actions that were not in themselves nuisances as public nuisances by municipal authorities as a matter of general principle. The Superior Court justice instead took issue with the form in which the ordinance was laid out. The first section of the ordinance declared that “the emission of more than 20 per cent of black or dark gray smoke from any chimney or smokestack where bituminous coal is used as fuel in connection with boilers for heating and power purposes, shall be deemed and is hereby declared a public nuisance.” Justice Rice took this declaration of public nuisance to be of no consequence since no penalty was attached. The third section of the ordinance did specify a penalty but its definition of the offense differed. It imposed a penalty on “Any corporation, copartnership or individual who shall or may allow, suffer or permit smoke from bituminous coal to be emitted or escape from any chimney...”
or smokestack used in connection with boilers for over three minutes’ duration at any one
time.” This definition of the offence omitted the phrase “more than twenty per cent black
or dark gray” and appeared therefore to attach a penalty to any and all smoke emission of
over three minutes, whatever its degree of darkness.

The court took this prohibition to be patently unreasonable – so unreasonable that
its unreasonableness was unworthy of discussion:

It is unnecessary to take up time and space in the discussion of the
question whether the courts have power to declare an ordinance void for
unreasonableness. Nor is it necessary for us to discuss the
unreasonableness of an ordinance that prohibits the emission of any smoke
whatever from bituminous coal for a longer period than three minutes.
That the court has such power and that the enforcement of such ordinance
would be impracticable, not to say impossible in present conditions are
propositions not seriously controverted by the appellants’s council.275

The justice recognized the norm of the application of a principle of charity in the
common law that would have dictated that “if an ordinance is susceptible of two
interpretations, one of which would make it reasonable and the other not, it is the duty of
the courts to adopt the former.” Yet the justice took the third section to stand on its own
and saw no more reason to read “twenty per cent” into the third section than to read
“three minutes” into the first. The justice went on to betray his wider feelings by calling
even the first section which defined smoke of more than twenty per cent black or dark
gray as a public nuisance “unreasonable” as well as “nugatory.” Nonetheless, he felt
“justified in withholding expression of opinion upon the other very important questions
discussed upon the argument, until a case shall arise in which it is necessary to decide
them.” The judge made it clear that such a case would involve an ordinance free from the
technical defects of the current one but which would also need to be “duly enacted, not
manifestly unreasonable, or oppressive, nor unwarrantably discriminatory.” And he had, in a parenthetical remark buried in the larger argument, made clear that he regarded the definition of the emission of smoke of more than twenty percent black or dark gray as a public nuisance as unreasonable.276

Looking back from 1906, former smoke inspector Brennan lamented: “The last smoke ordinance was knocked out by the court in 1902 and since then there has not been a single effort to improve conditions.”277 Brennan argued that Pittsburgh would then have been “free of smoke had not the law been nullified by the court in the Keech case ...” and that “the failure of the authorities to take any further steps after the court declared the last smoke ordinance invalid in the Keech case has made the nuisance greater and more obnoxious than before any attempt was made to enforce the law ...” Brennan also asserted: “The people of Pittsburgh generally desired to comply with the ordinance and they were trying to do so when the appeal was taken to court in the Keech case and the ordinance was knocked out.”278

3.13 The Struggle for Oakland: Nuisance Suits Against the Junction Railroad and Jones and Laughlin

With the overturning of the 1895 ordinance smoke abatement activists fell back on nuisance prosecutions. The East End remained the primary battleground with the neighborhood of the Oakland civic center, crossed by railroads and adjacent to large industrial plants as the site of greatest conflict. In 1903 Eliza Thaw Edwards approached the Allegheny County Court of Common Pleas sitting in Equity with a complaint against the Pittsburgh Junction Railroad. Although Thaw Edwards lived not in Oakland, but in
what was then considered Shadyside, the anti-smoke activists to whom she had connections were particularly interested in preventing damage to Oakland’s parks and monuments caused by smoke from the same railroad. If Thaw Edwards won her case, the railroad would be compelled to abide by the terms of its charter and emit smoke neither in Shadyside nor in Oakland.

Eliza Thaw Edwards was a member of one of the oldest and most prominent families in Pittsburgh. She was sister-in-law to Mrs. William Thaw Jr. who by 1912 would be president of the Twentieth Century Club, of which three 1890s LHPA executive committee members served as vice presidents. She was among five (of 17 officers or board members total) former LHPA members serving as officers or board members of that organization. Edwards’ sister-in-law would be treasurer of the Civic Club of Allegheny County, another organization descended from the LHPA, for forty-three years and one of three women specifically singled out for thanks in the Civic Club’s celebratory history of its first fifteen years. While Eliza Thaw Edwards herself was less prominent than her active sister-in-law, she served on the board of the Western Pennsylvania Hospital together with LHPA meeting hostess Matilda Denny.

Thaw Edwards sought an injunction against the railroad for injury to and depreciation of the mansion she had occupied for thirty years, since before the railroad entered the city, and for “the discomfort, annoyance and injury to ... health” caused by its smoke. She referred directly to the violation of the old ordinance in the case – the railroad’s charter forbade it to use bituminous coal as fuel within city limits. According to newspapers from as late as 1906 municipal authorities had never enforced the terms of the railroad’s charter. The Court of Common Pleas denied the injunction in 1903.
In 1904 the Junction Railroad was still creating problems. Twentieth Ward Councilman C. W. Helmold had presented petitions to Chief Ordinance Officer Murray Livingston, one with 400 signatures and the other with 200 or more signed by residents of the Twentieth, Sixteenth and Fourteenth Wards “protesting against the smoke that comes from the engines on the Pennsylvania and Pittsburgh Junction railroads.” Councilman Helmold claimed that “excuses were offered from time to time, but nothing was ever done ... Finding I could receive no assistance from the city authorities, I gave up in disgust. The smoke that comes from the engines of the Pennsylvania road between Ben.Venue and Roup stations in the East End is fearful.” Fourteenth ward (Oakland) councilman W. H. Stevenson denounced the city’s failure to control railroad smoke in his ward, where, according to the paper, “the Pittsburgh Junction railroad [was] violating the law.” Stevenson complained: “Residence property is ruined, the parks suffer greatly from the smoke and the new Carnegie technical school will be black as ink in a short time.”

In March 1906 Thaw Edwards appealed the 1903 Common Pleas ruling to the Supreme Court of Pennsylvania. Her lawyers argued that the railroad’s charter (passed November 30, 1881) made the prohibited action into a public nuisance. Lawyers for the railroad argued that the ordinance could not create a civil right for Edwards against the railroad or a Civil Duty of the railroad toward her. It was the city’s responsibility to do so and the lawyers made clear that: “Since the year 1900, the city of Pittsburg has acquiesced in the operation of the defendant’s railroad in violation of the terms of the ordinance.” Chief Justice C. J. Mitchell argued that it would clearly be within the rights of the City of Pittsburgh to bring a suit against the railroad “either under its right to rescind, expressly reserved in the ordinance, or its general right for condition broken”
and in such a case “there would be no defense.” Mitchell contended that what the court had to consider, in addition, was whether Edwards “as a private citizen [had] standing to maintain this bill.” The justice pointed to precedents supporting the view that a railroad occupying a public street “without authority by legislative grant ... constitutes a public nuisance and may be enjoined at the suit of a private citizen specially injured.” The violation of the condition of the ordinance abrogated the railroad’s charter and left it without authority to operate and therefore made it into a public nuisance, subject to injunction in any nuisance suit brought forward by a private individual. The Pennsylvania Supreme Court thus reversed the decree of the Allegheny County Court of Common Pleas – it issued the injunction and required that the Junction Railroad pay court costs.282 The railroad, with no other choice, decided to burn coke instead of soft coal inside the city, hauling the coal burning engines as cars behind the steaming coke burning ones.283

It was through connection with Eliza Thaw Edward’s nuisance suit that the LHPA claimed to have stopped the Junction Railroad’s destruction of foliage in Schenley Park (directly adjacent to the Carnegie Technical School that the newspaper interviews suggested that the railroad smoke would blacken.)284 LHPA leader Imogen Brashear Oakley regarded this, in retrospect, as the organization’s crowning achievement with respect to smoke: “We forced the Junction Railroad, which held the right of way across Schenley Park, to obey the terms of its charter and to be absolutely smokeless.”

A 1950 history of Pittsburgh’s public health laws regards the decision in the Keech case as having left Pittsburghers bereft of effective legal remedies against air pollution in period of intense industrial growth. These legal scholars see legal battles over air pollution by Jones and Laughlin in this era as representing the fate of citizens
who “in the absence of any ordinance regulating emission of smoke” must use “the only legal instrument available ... the expensive and cumbersome proceeding by injunction to restrain the production of smoke as a nuisance.” Eliza Thaw Edwards had been fortunate in the particulars of the legal situation of the Junction Railroad. Those contending with the red ore dust raining down on Oakland from the adjacent Jones and Laughlin plant would not have a municipally granted corporate charter that restricted pollution to rely on.

The claims made in the series of Times articles from 1900, discussed above, about smoke abatement at Jones and Laughlin should be met with skepticism. In the years following Jones and Laughlin’s remodeling of the American Ironworks with smoke consumption in mind, the firm was actually the target of a major pollution nuisance prosecution, but one focused on stack emissions of dust rather than smoke. Christine Rosen has pointed to this important court case as a landmark in the overturning of the doctrine of “balancing” costs and benefits of nuisance that had been employed in Huckenstine’s 1871 appeal. Rosen argues that the decision in Huckenstine’s Appeal which considers the economic value of benefits offered to the community by the industry and weighs them against the economic damage done by the pollution breaks with a tradition in nuisance law of considering the victim’s right to the enjoyment of his property as paramount. In Huckenstine’s Appeal the injunction issued by a lower court against use of the brick kiln was overturned by the Pennsylvania Supreme Court. Justice J. Hay Brown had ruled that the brick-burning should continue because the economic benefit it conferred on the community exceeded the economic cost it imposed. Rosen points out that this decision set a precedent for the use of such “balancing” reasoning in
Pennsylvania cases considerably earlier than in neighboring mid-Atlantic states. Without balancing reasoning judges had only the older tradition of stronger regard for injured rights on which to rely. Nonetheless, the case, however, marks continuity of environmental attitudes as well as change. Even though the plaintiffs in the case argued that Jones and Laughlin’s pollution was unacceptable, they did so by arguing that it was unacceptable because it was different in kind from the smoke pollution that they, as argued in Huckenstine’s Appeal, were bound to accept as residents of Pittsburgh.

In 1859 industrialists connected with the firm that would eventually become Jones and Laughlin had purchased riverfront farmland from Jennie Arthur Sullivan whose property lay both on top of and at the foot of a 150 foot high bluff overlooking the Monongahela River. The property at that time lay outside the City of Pittsburgh (Pitt Township, Borough of Ormsby) but was annexed to it in 1868. An iron furnace was built and put into operation on the property. Between March 1898 and May 1901 Jones and Laughlin rebuilt and enlarged three furnaces that constituted the “Eliza furnaces” on their property. The entire iron and steel industry at this time was undergoing a transition in the type of iron it used. The ore supply from the iron range in Michigan on which it had relied was nearing exhaustion and ironmakers sought new sources in the Mesaba iron range of Minnesota. Mesaba ore was of a different character than old range or rock ore. It was pulverized and dusty. Jones and Laughlin had been using Mesaba ore in their furnaces since 1894 and between 1894 and 1899 increased the proportion of dusty Mesaba Ore to rock or broken ore which had been used before. Jones and Laughlin claimed that this practice was common to all Pittsburgh ironmakers and that it in fact used a lower proportion of Mesaba Ore.
In September 1899 Jennie Sullivan and her husband brought a bill of complaint before the Allegheny County Court of Common Pleas, sitting in Equity, against Jones and Laughlin. They claimed that since Jones and Laughlin had begun running its three newly enlarged blast furnaces and a fourth newly built one using Mesaba Ore, greasy corrosive ore dust rained down on their property repeatedly, making the eight houses they had erected there and were trying to rent out “almost uninhabitable.” At certain points in furnace operation called “slips,” large amounts of red ore dust would escape from the stacks and rain down on the Oakland and South Side districts to the north and south of the river. The dust was corrosive and said to contain arsenic. The plaintiffs in the lawsuit had at one point removed three barrels of ore dust from porch roofs in the neighborhood. The ore dust “discolored fabrics and paints, injured carpets and curtains, destroyed fruit and shade trees and vegetation generally and depreciated the value of properties more than 25 per cent.” The Sullivans claimed that the use of Mesaba Ore in the furnaces “highly charged with gasses” caused explosions that liberated large clouds of ore dust that precipitated dust over the neighborhood. They contended that there were “a number of perfectly feasible appliances” that would reduce the ore dust pollution but that Jones and Laughlin refused to install them. They asked for an injunction against the pollution.

Jones and Laughlin answered by saying that its furnaces had been operating continuously on the land for forty years and that the plaintiffs had only noticed an increase in pollution because the years preceding 1899 had been years of depression in the iron industry. The corporation claimed that “slips” causing dust emission were very occasional and that the defendants lived very close to the stacks. They claimed that the plaintiff’s properties never were a desirable residence location and that they were near
many industries. Jones and Laughlin claimed not to know what appliances might be available to fix the problem but said that it had just recently entered into a contract with a firm that could briquette the ore and perhaps reduce dust emission and that it expected to have this new technology in place within ninety days.\textsuperscript{289}

The court issued findings of fact about the case. It found that the bluff above the furnaces was just about at the height of the smoke stacks. While it agreed with Jones and Laughlin that the furnaces had long been in place at the foot of the bluff, and were part of a manufacturing district, it also acknowledged that the plaintiff’s district had long been residential. Since these two districts adjoined one another the plaintiff’s neighborhood had long been subject to manufacturing smoke but not to ore dust until about July 1, 1901. The findings of fact also took as relevant the value of Jones and Laughlin’s property and the firm’s employment of 10,800 men. The court determined that slips were always part of blast furnace operation but that with Mesaba ore they occurred 4 to 18 times in 24 hours and liberated much more dust than with old range ore. The court acknowledged that the dust seriously depreciated property values.

The court of Common Pleas dismissed the Sullivan’s complaint and required them to pay court costs in a ruling on May 27, 1903. The court based its ruling on consideration of the “effect resulting from granting of a restraining order, that is, whether a greater injury will result. It identified a smoke-stack top dust catching technology but regarded both this and the ore-briquetting as experimental and so as not to be relied on to grant relief.\textsuperscript{290} In this way it applied the doctrine of balancing costs and benefits of nuisance established by Huckenstine’s Appeal. The court was convinced that the ore dust situation was due to the use of Mesaba Ore but that this was now a “necessity” and that to
restrict its use at the Eliza furnace would shortly make iron production impossible in all thirty-seven of Allegheny County’s blast furnaces.

The court discussed the obligation of all to bear the cost of Pittsburgh’s changing industrial geography:

Persons living in Pittsburgh must submit themselves to the consequences incident to a manufacturing district. If the growth and expansion of manufacturing industries make present residence neighborhoods undesirable, residents must either accept the changed conditions or seek other localities. Such has been the experience of our people and such it will continue to be so long as Pittsburgh is a growing manufacturing centre. Within very recent years Penn Avenue, below Sixth Street, was considered the most desirable residence locality in the City – today that part of the City is given over entirely to manufacturing establishments and business houses. Only recently residence sites on Bluff Street, Centre Avenue and Cliff Street were much sought after for quiet homes, with congenial surroundings. New and enlarged business enterprises, together with increased and changing population, have entirely transformed these localities; and even now the East End of the City, which was thought to be securely free from the annoyance incident to the manufacturing plants, experiences these inconveniences to some extent.291

While the court did not issue an injunction it invited the plaintiffs to seek “remedy at law” – that is, to sue for damages.

On June 3, 1903, the Sullivans began the process of appeal to the Pennsylvania State Supreme Court. Their case was argued on February 16, 1904 and reargued on March 28, 1904. The court affirmed that the neighborhood in which the Sullivan’s property was located had been before 1899, a more comfortable place in which to live.

The Supreme Court highlighted the lower court’s findings that

The residence district in which plaintiff’s property is situated, and which is part of the Fourteenth ward of the city of Pittsburgh, was, prior to the year 1899, a pleasant and habitable part of the city. While subject, as most parts of the city are, to smoke, it occasioned no special inconvenience to the inhabitants and the testimony shows that flowers, trees and shrubs were kept and cared for, and were not injured by any smoke or dust which might prevail throughout the district.292
Supreme Court Justice J. Hay Brown characterized the plaintiffs’ complaint as directed not at Pittsburgh’s characteristic pollution problems, but against an injury different, not just in degree but in kind, from these. In arguing this position he used rhetoric that seemed to justify the levels of pollution that others in the city were struggling to reduce. The Sullivans, according to Justice Brown, were not complaining of the smoke which everyone in Pittsburgh endured, not complaining of iron manufacture, even with Mesaba ore, but “that the appellee, in tearing down the three furnaces and replacing them with four new ones, of immense size and several times the capacity of the old, and in using in them the fine ‘Mesaba’ ores dusts, without so operating them as to prevent the escape of the dust from ‘slips’ causing admitted devastation, is practically confiscating their properties.” For Jones and Laughlin to have the right to pollute as it was, it would need to have the right of eminent domain over the property.293

Justice Brown argued against the idea on which use of the doctrine of balancing rested in Huckenstine’s appeal: the idea that injunctive relief was granted out of the grace of the judge and not because of a right of the plaintiff. Since judges were not usually to consider the consequences of their decisions, just the fairness of them, only in such a case, where a claim of right was not at stake, could a judge consider consequences through balancing the costs and benefits of nuisance. Justice Brown argued, however, that “no man can complain that he is injured by being prevented from doing to the hurt of another that which he has no right to do.” Balancing was not applicable when the action itself was tortious. On April 19, 1904 Justice Brown ruled against Jones and Laughlin: “perpetually enjoining ... [them] ... from such operation of its furnaces ... as to cause to be emitted therefrom clouds of ore dust, working and causing the injury to the property of
the appellants as in the bill described and found by the court below.”

Justice Brown, while asserting that Pittsburgh residents were bound to endure the “annoyance and discomfort” of ordinary smoke, affirmed the value of the civic environment by refusing to apply the doctrine of balancing to the ore dust nuisance.

As to the principle invoked, that a chancellor will refuse to enjoin when greater injury will result from granting than from refusing an injunction, it is enough to observe that it has no application where the act complained of is in itself, as well as in its incidents, tortious. In such a case it cannot be said that injury would result from an injunction. For no man can complain that he is injured by being prevented from doing to the hurt of another that which he has no right to do. Nor can it make the slightest difference that the plaintiff’s property is of insignificant value to him as compared with the advantages that would accrue to the defendants from its occupation. There can be no balancing of conveniences when such balancing involves the preservation of an established right, though possessed by a peasant only to the cottage as his home, and which will be extinguished if relief is not granted against one who would destroy it in artificially using his own land.

Chief Justice Mitchell dissented from the view that the ore dust pollution represented a change in the kind of injury. He contended that it was a change in degree only and that expansion in industrial capacity was a natural part of business. Justice Thompson provided a much longer dissent. He held on to the view that injunction was of grace rather than right. He would have refused to enjoin but seen a suit for damages as reasonable. He quoted the Allegheny County Common pleas judge’s view that an injunction in this case could shut down the region’s iron industry.

In January 1907, the Sullivans again addressed the Allegheny County Court of Common Pleas, charging that Jones and Laughlin still showered ore dust onto their property and should be held in contempt of the injunction. Jones and Laughlin was threatened with a fine of 5,000 dollars for its president and 100 dollars each for a number of its officials. Jones and Laughlin claimed that while some dust did still escape, the
quantity and frequency was nothing like that which had troubled the plaintiffs before the injunction. Further, they claimed that most of the dust escaped only when their furnaces were being attached to an anti-pollution apparatus, which, “being so extensive greatly disarrange and disturb the furnaces” and made “necessary the disconnecting and opening of certain pipes and parts of the furnaces, which contributed to the escape of ore dust.” They provided an impressive list of modifications to the furnaces, laboratory analysis of lime, fuel and ore undertaken to reduce the nuisance. The court took testimony beginning on February 7, 1907. This testimony amounted to 1,962 pages. The court found that contrary to Jones and Laughlin’s claims, there were large escapes of ore dust. They were too frequent to have occurred only when anti-pollution devices were being attached, but instead occurred “when the furnaces were being operated in the ordinary and usual way ... persistently, frequently both day and night.” In addition, Jones and Laughlin had built a fifth furnace since the granting of the injunction and it too emitted great clouds of ore dust. The court also affirmed that ore dust got into the plaintiff’s property and did great damage, though there was no evidence that damage to vegetation had persisted after the injunction or that property values had further declined. Nonetheless, property values had not risen in the neighborhood as they had in the rest of the city. The court did agree that ore dust deposits were less frequent and smaller in quantity than they had been before the injunction. Jones and Laughlin’s witnesses claimed that the quantity or ore dust deposited had been reduced by 80 percent. The corporation claimed that it had looked into every option to abate the pollution and spent $285,000 on anti-pollution technology and on research and had lost an additional $200,000 in reducing capacity in order to reduce emissions and in rejecting ore, coke and
limestone that would have exacerbated the problem. The court agreed that the defendants had “done everything human ingenuity could suggest” and that the spirit of the injunction had, for this reason not been violated and yet, that the remaining emissions were “substantially of the same kind of injury though not as great in extent.” The Court of Common Pleas felt bound to enforce the Supreme Court’s injunction until the time that Jones and Laughlin was able to convince the court the decree should be modified. So Jones and Laughlin was held to be in contempt of court.299

Jones and Laughlin immediately appealed to the Pennsylvania Supreme Court. As part of their “specifications of error” they submitted the list of their abatement activities. They claimed that they had built the fifth furnace as an experiment in the use of less-polluting technology with the hope that if results were satisfactory with it, the other furnaces could be modified to the same specifications. Jones and Laughlin also argued that pollution injury must be measured not with respect to the conditions of the whole city but with respect to neighborhoods bearing a similar geographical relation to manufacturing districts. The corporation further argued that the injury was different in degree but not in kind from that inflicted by ordinary Pittsburgh smoke and was due to the location of the plaintiff’s property within the city. It argued that the situation for the plaintiff was significantly improved because, since the injunction, their tenants had not left and no excessive expenses had been generated since the decree.300

The National Labor Tribune, usually silent in these years on smoke, printed a front page editorial in July of 1907:

The action taken by Judge Young, of the county courts, during the past week in the celebrated ore dust case is one which Jones and Laughlin allege may compel them to move their great iron and steel plant from the South Side to some other
locality and perhaps even to some other State. If it really involved any prospect of this sort, it would indeed be a serious matter, for a large population is dependent on the Jones and Laughlin plant, which gives employment to 7,000 or 8,000 men, and therefore sustains a population of not less than 25,000. And yet the population of Oakland, one of the most thickly settled portions of Pittsburg, is entitled to consideration too. Oakland has a population of about 40,000 people, and the ore dust which pours in a never-ending cloud from the blast furnaces of Jones and Laughlin makes residence in that section almost intolerable. The loss that property owners there have suffered through damage to their property is quite as great as would be caused by the moving of the blast furnaces and steel works.301

This response is particularly surprising from men whose livelihoods depended directly on the mill. It shows how pervasive (though admittedly not universal) new valuations of the civic environment had become. It also echoes the Supreme Court’s 1904 refusal to apply the doctrine of balancing. Nonetheless, in its 1907 decision, the Supreme Court would judge that the nuisance was no longer serious enough to be considered tortious in and of itself.

Justice Brown who had issued the initial injunction presided over the contempt appeal. He was determined to stand by the decree “without regard to consequences to the steel company in the operation of its furnaces. If it cannot operate them without practically destroying the properties of appellants, it must close them.” The judge was convinced however, that although witnesses said that the escaping ore dust was still frequent, in large quantity and injurious, since there was no longer injury to vegetation and since property values had not declined and tenants had not been forced to move away since the injunction, Jones and Laughlin was no longer engaged in the confiscation of property: “the finding is not that the same injury is being inflicted.” Brown reversed the lower court decision that held Jones and Laughlin in contempt. It was his view that despite continuing injury, the conditions of the injunction were being met.302
This case demonstrates the weakness of proceeding by nuisance suits. The common law of nuisance required that the plaintiff’s complaint be judged with reference to pollution standards of the surrounding area. The Sullivans could only win by claiming that the pollution they complained of was not that generally suffered in Pittsburgh. In practice, they could not have made any progress in the case by arguing that Pittsburgh’s level of air pollution was illegitimate because of the universally appealed-to precedent: “the people who live in such a city or within its sphere of influence do so of choice, and they voluntarily subject themselves to its peculiarities and its discomforts, for the greater benefit they think they derive from their residence or their business there. A chancellor cannot disregard all this.” The justices in both the Huenkenstine’s Appeal and the Jones and Laughlin Ore Dust case referred to the same precedent on this point:

If a man lives in town of necessity he must submit himself to the consequences of the obligations of trades which may be carried on in his immediate neighborhood, which are actually necessary for trade and commerce, also for the enjoyment of property, and for the benefit of the inhabitants of the town. If a man live in a street where there are numerous shops, and a shop is opened next door to him, which is carried on in a fair and reasonable way, he has no ground for complaint, because to himself individually there may arise much discomfort from the trade carried on in that shop.

Judges writing against the Sullivan’s position did so for several reasons. One was to contend that the expansion of industry is natural and that in selling the land to a blast furnace proprietor the plaintiff should have expected eventualities such as ore dust pollution. The other was to contend that because offering of an injunction (instead of insisting that the matter be settled with a suit for damages) was an act of grace and not a matter of plaintiff’s rights, the consequences of the decision could be considered and balancing could (and should) be applied.
In the context of the case, another important question arises: Did a technical solution exist to the problem of Jones and Laughlin’s Red Ore Dust? This question depends on the standards of environmental quality one wants to impose. In his initial decision, Justice Brown asserted his distrust in a technical solution to the problem since all those known were experimental and would not guarantee the plaintiffs relief from an injury he believed amounted to a confiscation of property. But in examining the contempt decision, Brown became convinced that a technical solution had already been implemented – Jones and Laughlin had reduced dust emissions enough that vegetation in Oakland was no longer damaged (at least not to the extent it had been earlier) and tenants were willing to rent the Sullivan properties. Yet, clearly a solution had not been adopted that would return the quality of south Oakland’s environment to what it had been before 1899, much less to a standard of acceptable air pollution that did not take the already smoky character of Pittsburgh’s air as a baseline. Certainly a change in raw materials might have improved the situation to the degree the Sullivans desired, but they dared not argue for that degree of constraint on the industry, since alternative ore was scarce.

A reduction in furnace capacity and a return to the level of production of earlier years – perhaps a reliance on more, but smaller furnaces to produce the same total output would have been possible. Are we to judge this to be an acceptable “technical solution”? Interestingly enough, it has much in common with one of the standard pieces of smoke abatement advice: it is important to make sure that one has adequate boiler capacity to generate the steam required in order to operate without excessive smoke. This was a perfectly acceptable solution to members of the Chamber of Commerce and the Engineers’ Society. The parallel suggestion would have been regarded, by authorities
such as Judge Brown, as outrageous restraint on the pursuit of economies of scale for an enterprise like Jones and Laughlin’s.

3.14 Progressive Reform in Pittsburgh and The Crusade of the Pittsburgh Sun

In the midst of this important court case, anti-smoke activism in Pittsburgh reached a new pitch. Smoke abatement would become a rallying cry for local progressives. 1906 marked a high point for both progressivism and smoke abatement activism in Pittsburgh – the city Lincoln Steffens had characterized in McClure’s just three years before as “A City Ashamed.” Steffens had linked political corruption and smoke. The section of his autobiography about the city recalled Parton: he titled the chapter “Pittsburgh: Hell With the Lid Lifted” and used the phrase again in the subtitle of his McClure’s article. Smoke abatement, through which it seemed possible to make tangible, if temporary, progress in these years, would become a symbol of what reform could accomplish.

To put smoke abatement activism in context, it is necessary to understand something about the character of progressivism in Pittsburgh. John Ingham sees its origins in organizations like the Western Pennsylvania Humane Society, founded in 1874, and the Pittsburgh Association for the Improvement of the Poor (1875). LHPA members like Louise Herron were instrumental in the founding and operation of these agencies. Ingham links Pittsburgh progressivism with the desire to systematize poor relief, and with dissatisfaction with machine politics. Organizations like the Chamber of Commerce, the Civic Club, and the younger generation of the upper classes they represented, sought to replace, in Roy Lubove’s words, “older traditions of paternalism, parochialism and amateurism out of touch with any ‘modernizing movements.’”306 Desire
for rational organization of both government and social services meant, for progressives, an increased reliance on professional and scientific expertise and an “end to the particularistic focus of the Magee-Flinn machine.”

Religion stood alongside rational systematization as a motivation for reform. The center of Pittsburgh’s progressive community was the Calvary Episcopal Church and the ethos inspired there by its pastor from 1889 to 1894, Reverend George Hodges. Ingham quotes Hodges’ biographer who credited him with the creating Pittsburgh’s progressive vision without which “the Pittsburgh of today, with its park systems and civic center” could not have come about. Hodges was committed to the Social Gospel and wanted to “build a bridge” between the East End where his church was located and poorer sections of the city. He, in fact, conducted religious services and concerts in the slum at Pittsburgh’s Point for this stated purpose. The Pittsburgh Dispatch printed his sermons in full every Monday morning. Hodges would also be instrumental in the establishment, in 1893, of Pittsburgh’s first settlement house, “Kingsley House” named for the British religious writer Charles Kingsley. Hodges’ followers, men like LHPA spokesman H. K. Porter and Chamber of Commerce chairman H. D. W. English, were so vigorous in their reform efforts that they and their fellow congregants were known by local machine politicians as “The D— Calvary Crowd.”

Lincoln Steffens’ piece was an indictment of the Magee-Flinn organization and its backing by businessmen like Andrew Mellon, and a chronicle of frustrated attempts by local progressives to dismantle it. Steffens undertook to show, with Pittsburgh as his examplar, that political corruption – “both police and financial” – did not depend on ethnicity. Solid Scotch-Irish stock was as capable of supporting the machine as the Irish
The Tweeds of New York, the Scandinavians of Minneapolis or the Germans of St. Louis. Pittsburgh was “the type of city that has tried to be free and failed ...” Steffens recounted the unsuccessful attempt by local reformers in consort with state-level (Quay machine) politicians to end control of the local machine. With the Magee-Flinn organization in disarray due to Boss Magee’s death in 1901, local reformers had organized a Citizens’ Party. By 1903, when Steffens was writing, the Citizens’ Party had been taken over by “grafters” and “the rats from Flinn’s sinking ship” attracted to the new party by the “smell of money.” Steffens lamented this defeat, but even he did not underestimate the tenacity of local Progressive forces. In 1903, Pittsburgh’s progressives could look forward to real, if temporary, political victories.

In 1906 Democrat George W. Gurthrie, a vestryman at Calvary was elected mayor, filling a power vacuum left by a state shake up of Pittsburgh’s municipal government. According to John Ingham, Guthrie was “an impeccable member of Pittsburgh’s Core Upper Class,” “married to [an] iron and steel famil[y]” Guthrie’s allies would go on to form the Voters’ League whose anti-graft campaign would later land eighteen councilmen and several bankers in prison. Guthrie would be a strong supporter of smoke abatement, which was already a central part of Pittsburgh’s progressive program.

Guthrie’s inauguration in 1906 would correspond with the founding of a new Democratic afternoon paper, the *Pittsburgh Sun*, which would immediately undertake an anti-smoke crusade. The *Sun* was published by the *Post*, the paper of the minority Democratic Party in the city. The *Post* had long taken vigorous editorial stands in opposition to the Republican machine and the machine’s paper the *Pittsburg Times.*
Smoke abatement would become the new *Sun*’s signature theme. The *Sun* alone published more than 55 articles on smoke between June and October 1906. The *Sun*’s articles on the municipal politics of smoke abatement were filled out by naming names and describing conditions produced by the worst of the smoke makers – notable among them its rival newspaper, *The Pittsburg Times*. Other papers also took up the crusade, but they accompanied rather than led the charge. The *Pittsburgh Gazette-Times* (the *Pittsburgh Gazette* purchased the *Pittsburg Times* in 1906), the *Pittsburg Daily Dispatch* and the *Pittsburgh Post* together published more than 20 articles on smoke between June and November 1906.

At the top of the *Sun*’s front page on June 22, 1906 was a banner reading: “THE WAY TO STOP THE SMOKE NUISANCE IS TO STOP IT!.” Beneath it was a front page article on smoke. *Sun* representatives approached the city attorney directly to ask what was being done about smoke ordinances and the city attorney responded that it was not up to him but that he would do whatever the mayor and councils instructed on the matter. The *Sun* next approached a sympathetic first-term councilman who said he believed that a smoke ordinance could be made for Pittsburgh “without interfering with our business interests.”

### 3.15 Comfort and Cleanliness As Legitimate Values in the Sun’s Crusade

The language of the *Sun*’s initial article departed from that of the 1860s and 1870s, and this would be true for the rest of the newspaper campaign as well. The *Sun* emphasized smoke’s effects rather than cost savings for smoke makers, collapsing categories of the aesthetic and the economic. The *Sun* complained of the negative impression made on
both visitors and the local public by the smoky appearance of the Pennsylvania Station railroad depot. It lamented the ruination of a “new suit” or “handsome dress,” the “gay clothes” that might be worn by a pedestrian walking along the top of a wall above the smoking engines at the depot. The paper linked ornate clothing to monetary value when it spoke of the “dainty white dresses ... blackened by soot” – the clothing of thousands of pedestrians ruined by steam stand diggers working beneath the Seventh Street Bridge over which they crossed daily. It claimed that “more clothing has been ruined than could be purchased with the monetary returns from the sand and gravel gathered at that point.”

Such comments contrast with James Parton’s picture of the town in which only clothing was worn that blended in with the “dingy livery of the place” and in which “all showy and dainty apparel was forbidden by the state of the atmosphere.” As we have seen, both local and national writers, Parton, Thurston and many others, had celebrated Pittsburgh’s uniqueness and departure from ordinary civic conventions in its production and tolerance of prodigious smoke. In the Sun article, however, the “New York man” asks the Pittsburgher why locomotives don’t burn hard coal within city limits. The paper answers for the imaginary resident that there can be no other answer than that Pittsburghers are “easy marks.” The paper posited an awakening of Pittsburgh residents in which they asked themselves “Why can’t I have a decent place to live as well as they have in other parts of the country?” Again the paper held Pittsburgh to the same standards as other cities, even older Eastern cities such as New York, rather than celebrating its frontier uniqueness and newness. The article began by targeting mobile sources of smoke, shared by Pittsburgh and other cities, rather than the heavy industrial
sources that set Pittsburgh apart from cities such as New York. It claimed that mobile
sources such as railroads, hoists, and cranes were an easy place to begin smoke
abatement, despite the fact that it was often argued that for these machines it was most
difficult to design low-smoke combustion devices. Instead of urging the adoption of such
devices, the paper urged the use of coke or hard coal. The suggestion that hard coal
should be used in the bituminous capital of the world was a bold gesture – an attack on an
important source of regional prosperity and identity.320

The Sun celebrated ways of living that emphasized comfort, cleanliness and
aesthetics as legitimate civic and domestic values – values dismissed by the writers of the
1860s and 1870s. The paper interviewed local property owners and housewives about the
effects of smoke on domestic conditions. In a feature on the ore dust nuisance in Oakland
the Sun interviewed a “well known man” residing on Bouquet street in south Oakland:

Here, look at these dogs (picking up two handsome French poodles) they were
just washed yesterday and now just look at them! Their feet are always covered
with that reddish powder when ever they attempt to run about the place. This
morning things were very bad around here. That ore dust was covering
everything. The walks had to be swept before we could use them ... I bought an
extra lot and spent about $10,000 on improvements on my place here on the
strength of that supreme court decisions enjoining the Jones and Laughlin
company from making the dust nuisance. Just now I think I would have trouble
disposing of the whole place for that sum. You can put me down as saying that I
am ready to get into any movement that will compel the company to stop making
that ore dust.321

On Frazier street “directly over the plant” the Sun reported on the “especially bad”
situation in a row of 7 houses only 2 of which were usually rented – and none for longer
than it takes people to move out again. A neighborhood woman complained of the effects
on her housekeeping:
When that dust hits the wet clothes they make marks as if they had been burned. The iron gets right into the material and ruins the fabric. If you run your hand over my piano you will have to wash it as soon as possible ... A man with his wife came to look at the house next door yesterday with a view to buying it. After they had been here a little while one of those great clouds of dust came along and as soon as the woman saw the way that stuff was falling all over everything she threw up her hands and refused to have anything more to do with the property.\textsuperscript{322}

The \textit{Sun} in 1906 regarded domestic cleanliness, front lawns and “comfort and ease” much more highly than Pittsburgh newspapers regarded Huckenstine’s neighbors’ orchards and grounds “beautified by money, taste and the skill of the landscape gardener” in 1871. Domestic cleanliness and comfort was closely associated with property values in the \textit{Sun}’s rhetoric.\textsuperscript{323} In addition, the paper complained about damage to civic property from smoke: the “fine chiselings” on W.H. Richardson’s masterpiece, the Allegheny County Courthouse, could not be seen since the building was covered with “smoky grime” and the new Catholic cathedral was covered with soot before it was even dedicated.\textsuperscript{324}

In one of its earliest articles the \textit{Sun} interviewed the mistresses of two well kept houses: one described as “bearing the evidence of care and attention” and the other as a “recently purchased brick residence” with a “nice lawn in front” and “the appearance of comfort and ease”. Both homes, located next to the smoking stacks of the Prairie Laundry Company were covered in “terrible dirt.”\textsuperscript{325} The \textit{Sun} worried about the effects of smoke from another laundry company on “expensive private residences” in Wilkinsburg.\textsuperscript{326} In a later article the \textit{Sun} interviewed the “mistress of a handsome home on Fremont Street” next to the Fort Wayne and Chicago Railroad roundhouse in Allegheny that the paper regarded as the “Real Soot Octopus.” The mistress is quoted:
Why, that smoke pours out Filmore Street from the roundhouse onto Fremont street in such masses that frequently when we are sitting out here on the steps it is absolutely impossible to see the arc light hanging here. The street just gets black with the dirty stuff... I never dare to let the front and back doors be open at once, nor for a moment or this whole house would be filled with smoke that if you didn’t live here and weren’t accustomed to things you would just naturally think the place was a fire. And it is only necessary to rub your handkerchief any time over the table to have it thoroughly covered with dirty soot and grime. We are forever housecleaning here and can not ever let up for a moment or this place would be too dirty to live in at all.\textsuperscript{327}

The Sun’s defense of domestic comfort was closely linked to battles over industry’s power to transform neighborhoods through pollution, so prominent in the nuisance cases discussed above. The roundhouse was located in a neighborhood in Allegheny, the section of the city that had formerly been a center of elite residence. Atlases from the period show that the roundhouse was not a new presence in the neighborhood – it is visible on maps in an 1872 atlas in the same location. At that time the area was comparatively empty of homes. The roundhouse was about ten blocks directly north of the neighborhood that had traditionally been the home of the Allegheny’s elite, just upwind of the smoke of the city of Pittsburgh, a bit north and west of the Point. It directly abutted, as late as 1901, vacant property belonging to Matilda Denny, heir to one of Pittsburgh’s largest landed fortunes, hostess to LHPA meetings. By 1890, Freemont street, directly across from the roundhouse, was the location of a number of residences, which also appeared in the 1901 atlas.\textsuperscript{328} While these residences were not palatial, they were clearly valuable property. As late as the mid 1890s Fremont was clearly a street of elite, though perhaps not truly upper class, residence. A short street, it was listed as an address fifteen times in the 1895 Blue Book. Similarly Bouquet Street in Oakland was listed fifteen times. Neither street was listed in the more upper class 1904
Social Directory. Allegheny’s Ridge Avenue, a frequently mentioned site of upper class residence, in contrast, was given as an address over one hundred (116) times in the 1895 Blue Book and thirty-seven times in the 1904 Social Directory.

In August 1906, residents adjacent to the roundhouse delivered a petition to the Mayor of Allegheny. Residents of Freemont street had not yet given up on Allegheny as had many of their more solidly upper class neighbors. While the Fremont street residents were not responding to a new pollution situation, as the Bouquet Street residents were, they were all too aware of the industrially generated changes, discussed in this chapter, that had displaced Allegheny as the center of elite culture. They were trying to save the character of their neighborhood while they could.

3.16 Framing a New Ordinance: Pittsburgh’s Mills and Its Exceptional Smoke Problem

The Sun claimed that its own campaign led directly to legislative action and real improvements in the smoke situation. Newly elected Select Councilman Corwin D. Tilbury was quoted by the paper as ready to make smoke his mission. He said: “I have been reading those smoke articles in The Sun and have become much interested. My understanding is that the people have reduced the nuisance in other cities to a minimum and I can see no reason why Pittsburgh can’t do the same thing.” As a result of reading the paper, Tilbury was ready to present a resolution to councils asking them to instruct the city attorney to draw up an ordinance.

By June 26, four days after the Sun had begun its campaign, Councilman Tilbury had introduced a resolution, immediately passed by councils, to instruct City Solicitor W. H. Rodgers to draw up an ordinance which the councils could then act on. The paper was
jubilant, congratulating itself, and congratulating other newspapers for following its example. It proudly proclaimed that councilman Tilbury had asked for the Sun’s help in drawing up an ordinance that would “stand in the courts” and that would “not in any way be detrimental to manufacturing interests.” The Sun continued to argue for the need for an ordinance and to report on Councilman Tilbury’s efforts to help to frame one while it was waiting for the city solicitor to take action. The paper actually claimed that the city was already cleaner as a result of its crusade, although no ordinance had yet been passed. It reported that by early July, Pittsburgh’s mayor Guthrie was receiving 12 letters a day in support of the smoke crusade and that the mayor himself supported passage of a strong ordinance.

Business organizations in Pittsburgh announced themselves in the Sun as energetically backing work against smoke. Pittsburgh’s progressives had strong ties to such organizations. H.K. Porter and H. D. W. English held important positions in the Pittsburgh Chamber of Commerce. From 1899 on, the Chamber’s yearbooks and annual reports repeatedly linked smoke abatement and the need for economic diversification. Its 1903 yearbook argued that the “workshop of the world” should not remain “a workshop alone.” It emphasized Pittsburgh’s spectacular topography and its potential as a peerless site for beautiful homes and as “a haven of health, beauty and comfort for our hours of rest.” The 1910 annual report would stress economic diversification and the application of Pittsburgh’s “great natural advantages” beyond the “manufacturing of finished and semi-finished iron and steel.” The Chamber, together with the Oakland Board of Trade and the Lincoln Board of Trade in East Liberty expressed commitments to be part of the Sun’s fight against smoke. These business organizations did not try to pass the
buck on smoke to non-capitalist coal burners, as had been done in the 1892 Engineers’ Society meetings in which defensive industrial fingers pointed at domestic grates. The smoke abatement committee of East Liberty’s Lincoln Board of Trade, in their correspondence with The Sun, targeted “manufacturers,” particularly a local brickyard and beef packing plants, as well as “railway stacks,” as their smoke-making enemies. The Board of Trade singled out a brickyard, the very sort of industrial enterprise regarded in Huckenstine’s appeal as the embodiment of virtuous industry providing “sustenance” for its owner and for the city itself. It is difficult to access the depth of business and industrial commitment to smoke abatement, however. Several of the concerns highlighted as having made excellent progress against smoke in The Pittsburg Times articles of 1900 would be cited by the Sun in 1906 as among the worst smoke makers. One article featured an exposé of the Epping-Carpenter company, which had been praised by the Times. The Sun was particularly happy about the voluntary progress it had inspired in Pittsburgh’s central business district. If downtown smoke makers cleaned up of their own accord it would “be easier to devote the greatest attention to the manufacturing establishments on the outside.” The paper then proceeded to name some of the worst offenders among the metal-working establishments: the La Belle Works in Allegheny and Park Mills in what would later be known as the Strip District. The Sun also credited itself when “several of the most prominent manufacturing firms in the city were putting in smoke-preventing devices.” The Clark Mills on 31st Street along the Allegheny River which had been a “very bad smoke producer” affecting the immediate area and the
downtown had decided to “install attachments” as had the Dilworth Porter Plant on the South Side for its nineteen boilers.342

With these claims the Sun got to the heart of Pittsburgh’s special smoke abatement difficulties, visible in the shape of its earlier smoke ordinances and in the 1890s debates at the Engineer’s Society. Writers in the Sun took a range of positions on mill smoke. While some understood mills as a legitimate target for smoke abatement, as in the discussion above, most accepted claims about the irreducible smoke-making needs of metal furnace, which had been brought forward by Metcalf in 1892. Manufacturers continued to argue that iron mills had special smoke abatement problems and defended the necessity for smoke-making for metal puddling and heating furnaces on the grounds that some smoke was necessary to insure that combustion temperatures did not reach a level that would damage the iron, the furnace, or both. Some engineers, as early as 1892 (including Metcalf’s own metallurgical researcher, Langley) had tried to circumscribe these claims – a small fraction of metallurgical furnaces needed to make a very small amount of smoke at a particular point in production. For the most part, such qualifications had fallen on deaf ears. Most writers in the Sun, along with smoke abatement proponents in councils accepted the more general claim and it caused a special problem in the framing of smoke ordinances. This special problem made Pittsburgh’s smoke situation incomparable to that obtaining in other cities.

“Non-discrimination” was a major challenge in the framing of a new ordinance. The previous smoke ordinance had been struck down the first time it was challenged by the Keech Company on the grounds that it was discriminatory, since it regulated only boilers and implicitly exempted mill furnaces. When councilman Tilbury drafted his
ordinance, finishing on July 17, the paper commented that the ordinance would not “injure manufacturing interests such as puddling furnaces or roller mill heating furnaces ... but every other type of smoke producer that has no excuse ... will have to come to time.” It went on to say that mill furnaces of these types were “very few in number compared to the regulation type ... the necessary smoke they make will not bother.” The ordinance was intended to control the “vast majority of stacks ... over manufacturing plants and office buildings.” By mentioning the intention not to restrict puddling and heating furnaces the paper pointed out that “the whole instrument [was] arranged and adjusted to meet the peculiar conditions that obtain in Pittsburgh.”

Once councilman Tilbury had drawn up his proposed ordinance, conflict arose over whether it was possible to include an explicit exception for such mill furnaces. The Sun summed the difficulty up as follows:

Some confusion is anticipated in the exceptions contained in the new smoke regulation. Puddling furnaces and roller mill heating furnaces, it is said, can’t help making smoke, and as a matter of fact smoke is a necessary element in the fires which they use in the treating of the metal. But it is feared that the attorneys will say that a law must apply to everyone equally or it will not be constitutional in which case, the reading of the instrument in that particular might have to be changed,. But the contemplated exceptions are thought to be necessary in order to meet the peculiar conditions such as are found in a manufacturing center like Pittsburgh.

The special problems of the mills set Pittsburgh apart. Even the architects of the new smoke abatement campaign were not prepared to threaten the city’s foundations by regulating its metallurgical furnaces. Given Pittsburgh’s emblematic industrial tradition, the whole enterprise of drawing up a smoke ordinance was a matter of balancing Pittsburgh’s unique needs and character with its aspirations to raise at least some aspects of its environmental conditions to the standards set by other cities. Tilbury began his
efforts to help frame the new ordinance by writing to mayors and smoke inspectors of
cities such as Cleveland, Chicago, Philadelphia, New York, Boston, Indianapolis and
Joliet Ill. to request copies of their ordinances and to solicit advice about how to
approach Pittsburgh’s smoke problem. The paper printed a number of the responses
Tilbury received. Tilbury even compared Pittsburgh’s future level of cleanliness to that
he had observed in the queen city of Europe: Edinburgh, long known for its pure air and
salubrious topographical situation. Yet ordinances suitable for other cities could not be
applied directly to Pittsburgh because of its unique industrial character.

On July 3, when the city solicitor offered a brief draft ordinance prohibiting
smoke of more than 20% black for an unspecified period of time per hour, Tilbury and
the Sun criticized the ordinance as “off hand” and framed with “no investigation or
knowledge” and as one which “would never meet the needs of a city like Pittsburgh.”
Tilbury undertook a major campaign to amass the technical knowledge needed to tailor a
legally robust ordinance that would meet the special problems of all of Pittsburgh’s
smoke makers. The councilman intended to “call on practical engineers and master
mechanics” from all kinds of “manufactories and office buildings” “where all kinds of
boilers are used” in order to come up with a technically detailed and customized
solution.

Attitudes toward the pollution from the mills were complex and contradictory.
This is evident both in conflict over ore dust pollution from the Jones and Laughlin’s
Eliza furnaces and over the difficulties with framing a smoke ordinance that would be
non-discriminatory yet would meet whatever special needs the mills could legitimately
be said to have. Despite ambivalence in such attitudes, clear differences emerge between
the range of positions possible in this era and those possible forty to fifty years earlier. In
the 1900s all industry was no longer equated with “sustenance.” Instead, both ore dust
pollution in Oakland and the efforts of an ice company to meet a surge in summer
demand, bringing with it a surge in smoke, were attributed to “over-production” due to
greed. Jones and Laughlin was said to be putting 1000 tons of ore in furnaces built to take
100 tons.

Even Jones and Laughlin acted against pollution in response to court decrees
made possible by such changed environmental attitudes. Although Jones and Laughlin
had promised a local judge several years earlier to abate the nuisance by installing a
Cyclone Dust Catcher to eliminate 95% of the dust, the attempt had been an “absolute
failure.”350 Despite Jones and Laughlin’s dismal pollution record with respect to ore dust,
the company was featured positively in one of the Sun’s smoke abatement articles. The
Sun interviewed a smoke consumer company representative who had just signed a
contract with Jones and Laughlin to put attachments on 35 boilers at its South Side
works. The consumer company representative claimed that the devices would “mean an
immense reduction in smoke from that quarter of the city and the river winds won’t carry
so much dirt as they have been in the habit of doing.” He claimed that Jones and
Laughlin was motivated by an interest in fuel savings and that they too had been reading
the Sun and wanted to do things right.351 The smoke abatement devices were being
attached to boilers at a different J&L plant from the one at which ore dust had been a
problem, so did not have any bearing on their biggest pollution offense. Even at the Eliza
furnaces, Jones and Laughlin claimed to have spent hundreds of thousands of dollars to
mitigate the nuisance.352
3.17 Drafting the 1906 Smoke Ordinance

By July 17, Councilman Tilbury had drafted an ordinance loosely based on that of Indianapolis, augmented by “the best features of laws from other cities” and understood to exclude mill puddling and heating furnaces. No percentage of smoke or time limits for emission were specified as in the old ordinance. Other features of the law highlighted by proponents were that all personnel from owners down to firemen could be held responsible for smoke and that much time would be given for plants to make any required changes, with the time allotted tailored to the changes requested. After Tilbury had drawn up his ordinance there were “rumors” that “several big corporations [were] preparing to fight it” because it would mean a reduction in coal orders and the expense of installing smoke consumers. In response, the paper reiterated the way in which the ordinance was tailored especially for Pittsburgh remarking that if any of the ordinances of other cities compiled by Tilbury had been applied as is to Pittsburgh “manufacturers and businessmen here might have [had] some real cause for complaint.”

Tilbury presented the ordinance to the councils on July 23 and it was immediately referred to the finance committee since it required financial provisions to be made for salaries. It was initially expected to pass before the councils’ summer vacation. The ordinance prohibited all dense smoke from all kinds of boilers and furnaces with the exception of those in private residences. It did not carry an explicit exception for metal working furnaces because of fears that the courts would regard that as discriminatory. Nevertheless, proponents argued that if such smoke was necessary, the inspector would acknowledge this. As Tilbury explained: “the necessity of these furnaces to make smoke
was duly recognized and ... any court would exercise discretion concerning them in the
spirit of the ordinance. The puddling furnaces had been excepted in the original draft of
the ordinance but on legal advice all the exceptions were left out of the bill, exclusive of
private residences."\(^{357}\)

While supporters awaited action from the finance committee the Sun continued to
point out, by name and description, firms that “needed” the ordinance\(^{358}\) as well as to
describe exemplary establishments.\(^{359}\) It also reported on the dangerous consequences of
smoke-exacerbated weather and health conditions in articles with titles like: “Black Fog
Is Responsible For Accidents – McKeesport Boy Is Killed in a Traction Collision and
Two Wagons Wrecked By Cars on Point Bridge – Trains Are Also Delayed,”\(^{360}\)
“Midnight Gloom Enveloped City,”\(^{361}\) and “Smoke Turns Down Naval Applicants –
Many Applicants for Enlistment at Local Recruiting Station Show Eye Troubles Due to
Our Atmosphere.”\(^{362}\) The paper also picked apart opposing newspaper editorials that
argued that the ordinance was an exercise in the contemplation of an ideal and an attempt
to do the impossible. It used its grasp of precedent to argue against other papers.
Opposing editorialists claimed that the previous ordinance had been struck down because
it was too severe – and so concluded that an ordinance which prohibited all dense smoke
rather than 20% black for more than 3 minutes per hour, would surely be struck down as
even more severe.\(^{363}\) The Sun countered by pointing out, that the charge of discrimination
rather than the severity of the ordinance was responsible for the overturning of the
previous ordinance. Actually, both severity and discrimination had been at issue.
Throughout the period, opinions varied on which sources of smoke were the most serious. The Sun and smoke abatement officials generally blamed manufacturers and locomotives, followed by office building boilers and mobile steam engines. Tilbury himself, and many of the Sun’s articles complained that railroads were a very important source, yet they had been left out of the ordinances of the 1890s and of the draft ordinance offered by the city solicitor. Tilbury claimed the railroads made three times the smoke as the biggest boiler in the city. The Sun claimed that “Any single locomotive stack in the same length of time can make more smoke than the largest chimney over any plant in Pittsburgh.” The Sun’s campaign coincided with the consideration of Eliza Thaw Edward’s nuisance case appeal against the Pittsburgh Junction Railroad before the Pennsylvania Supreme Court. The court, as we have seen, would constrain the railroad to burn smokeless fuel within city limits.

Although the Junction eventually capitulated simply by burning coke, railroad officials often claimed that they could not comply with smoke abatement regulations because adequate stokers and smoke consumers did not exist for locomotive engines. Consensus among Pittsburgh anti-smoke forces in the 1890s was that if railroads were unable to abate smoke in any other way they would have to be required to burn fuel other than bituminous coal within city limits. The Sun claimed that the railroads’ resistance to use of other fuels was nothing more than “babytalk.”

While waiting for action from the finance committee, the Sun had gotten wind of the existence of old ordinances regulating smoke in Pittsburgh and Allegheny that had not been enforced. Two days after the Sun dropped a hint about such ordinance on its
pages, the director of Public Works of the City of Pittsburgh, James W. Clark, wrote to all the railroad companies in the city calling their attention to an ordinance on the books since (at least) 1874, which had up to that time never been enforced, that prohibited any locomotive from burning wood or soft coal within city limits. Clark put the companies on notice that they would be given a month to comply. The discovery of such a strong ordinance from the past made it unnecessary to include a railroad provision in the new ordinance, which was weaker than the old law.369

Around August 21, perhaps influenced by the fate of the Junction, some railroads had begun to restrict smoke.370 City officials asserted that they would not hold railroads to the letter of the law, which required fuel change, if railroads were managing to refrain from the creation of nuisances by other means.371 Two days later, the paper printed a report on the smoke ordinance that had been on the books in Allegheny city since 1897, and asked repeatedly why it had not been enforced, answering with the refrain: “Ask the department of public safety in Allegheny city hall.”372 On October 16, Chief Clerk of the Pennsylvania Railroad E. F. Crawford, in charge of motive power, reported to the Sun that the railroad had put smoke consumers (steam jets) on thirty locomotives in the Pittsburgh area and that they were working well. The Sun applauded the “Great Corporation.”373

Railroad smoke presented a particularly attractive target for abatement agitation in Pittsburgh. Ordinances to restrict it already existed, though they had not been enforced. Difficulties with rights created by state railroad charters had made the enforcement of local smoke restrictions difficult.374 Technical problems also complicated locomotive smoke regulation. Space for a firebox in a locomotive cab was small. Since it was not
possible to build a large fire, a very high rate of combustion was required to produce
even power. This necessitated a strong draft, but a strong draft caused the loss of both
heat and cinders and gasses to the outside. Railroad smoke was particularly objectionable
because it discharged smoke outside of industrial areas and near street-level. The
Pennsylvania Railroad at this time was facing pressure in a number of cities to abate
smoke, and conducting on-going research on smoke abatement technologies in its main
shop in Altoona. The coke-fuel required by regulations on some railroads in Pittsburgh
represented an expensive and therefore undesirable solution to the problem. Yet
railroads were easy political targets for activist energy, especially in Pittsburgh. Because
they were seen as external economic interests, not employing the thousands in Pittsburgh
employed by the mills, threatening them was less risky than attacking Jones and
Laughlin. Further, they bore a very different symbolic relationship to the city. While the
mills were central to Pittsburgh’s civic identity, the Pennsylvania Railroad, in particular,
had long represented monopoly power, historically hated by workers and elites alike.
Action against the railroads also provided a way for activists to channel their energies as
they waited for councils’ action on the Tilbury Bill and they met with notable success.

3.19 Slow Progress on the Tilbury Bill

By mid-September the existence of organized opposition was apparent. Dale Grinder
points to Charles Lockhart, owner of a McKees Rocks iron and steel works, and his
superintendent Samuel Poster (on Select Council) as key members of the opposition to
the new ordinance. Newspapers characterized this opposition as made up of a
Republican “combine” in the councils who opposed the new Democratic mayor and any
programs associated with him. The bill eventually found its way to the Select Council’s Health and Sanitation Committee, which had been formed three years earlier but had not yet considered a bill.\textsuperscript{377} By the end of September, after having been “warned” by Mayor Guthrie to stop dragging their feet and to start to serve the people’s interests, the Health and Sanitation Committee made its first quorum in three years and unanimously passed the ordinance after it had been assured that it would not adversely affect puddling furnaces. Smoke abatement forces were again hopeful.\textsuperscript{378}

Tilbury claimed he had met with no opposition in the Select branch but had heard rumbles of opposition in the Common branch. One member of Common Council supposedly opposed the smoke ordinance because it would require his employer, an iron manufacturer, to remodel. Common Council members were heard to make remarks like “Smoke makes Pittsburgh famous.” “Smoke indicates prosperity.” and “There are no devices that eliminate smoke.” The \textit{Sun} countered by saying that if such lawmakers were honest, then they were also ignorant, since Tilbury’s correspondence with other cities had shown that similar ordinances had led to reductions in smoke of up to 75%. The paper complained of “disgusting aggrandizement on the part of selfish manufacturers.”\textsuperscript{379}

At the October 8 Select Council meeting the bill’s opponents voted to send the ordinance, which had already been thoroughly reviewed by competent lawyers, including the mayor, to the city solicitor for his legal opinion. This was regarded by the \textit{Sun} as a delaying tactic promoted by the likes of Select councilman Dr. W. H. Weber who “comes from the South Side where they have many large mills which make a great deal of unnecessary smoke.” According to the \textit{Sun} “Weber asserted that the people of the South Side wouldn’t stand for the ordinance on account of the open hearth furnaces and
cupolas.” Tilbury was trapped – such objections had been foreseen, but exception clauses could not be included in the ordinance for fear that they would make it discriminatory. The Sun claimed that the “sentiment” of fear of injury to manufacturing ruled and caused action to be delayed.

Yet, Tilbury ostensibly remained optimistic.380 And the mayor railed against council’s action: “It is not the dot of an ‘i’ or the cross of a ‘t’ that the people care about in a smoke ordinance ... There is a cry from all over the city for this and something will have to be done in councils.”381 The Sun described a “storm of indignation” among the local public and complained about the smoke losses of “big dry goods merchants” forced to sell “ruined goods” and “bargain prices.”382 It also discussed a member of Common Council who had been heard to say on the street in his East End ward that the Tilbury ordinance would cost the jobs of workmen. The paper complained that “such talk sounds very much like ‘instructions’ bidding for the support of laboring constituencies preparatory to unpatriotic opposition calculated to develop in Common Council later.” It also reported on councilmen who used their own good health despite the smoke as counterexamples to health arguments against it.383

In a move that the Sun saw as definitive, the local chapter of the National Association of Stationary Engineers, a labor organization representing those responsible for local furnaces, passed a resolution supporting Tilbury’s ordinance and endorsing its applicability to Pittsburgh’s smoke problem. They sent a letter to the councils addressed to “those in official positions and out who ignorantly insist that the smoke nuisance in industry cannot be regulated and that there is nothing more for us to do than grin and bear it.” And they stated that the NASE, “the largest local organization of qualified, licensed
and thoroughly practical steam engineers in United States,” in which every one of whose members had “passed examinations in his profession and was recognized by fuel-burning authorities everywhere as being qualified to express an opinion on this subject that has some value and weight,” supported the ordinance. The president of one of the two local chapters (chief engineer at the Pittsburgh Savings Bank) said that the Pittsburgh smoke situation could be “readily controlled.” The NASE’s opinion, however, did not convince opponents in the Select Council.

On October 23 the Sun’s front page carried a huge political cartoon picturing the smoke ordinance being thrown into a cobweb ridden attic with the banner “Father Pitt – Halloween Has Started a Little Early.” The night before councils had voted 19 to 12 to postpone consideration of the smoke ordinance indefinitely. Select Council president, Dr. E. R. Walters and his combine allies voted not to permit the bill’s supporters to speak. Tilbury voiced his disgust at the action and at the offer made to him by several councilmen to support the ordinance if he would become a permanent member of the “combine.” The paper printed a full list of the ayes and nays on the ordinance and called the latter (nays on postponement) the “roll of honor as being desirous of the public welfare.” According to Grinder:

The man to beat was Mayor Guthrie, and since members of the combine saw Tilbury often voting for issues supported by the mayor, Tilbury was to be punished. His bill was not to become law unless he weaned himself away from the mayor’s men and the reform wing of the council. This he refused to do.

Supporters saw the action as inexplicable – the city solicitor had found no major problems with the ordinance and Tilbury, who had conferred with him in advance, had a list of amendments ready to make minor corrections he had requested. These
amendments were made to the ordinance and still action was postponed. Councilman W. H. Stevenson called council action “incomprehensible” and said that in the worst days of “the Ring”

... nothing like it ever happened. The smoke bill was not killed. It was choked. In all my three years experience in council, I never saw anything that could equal that action last night. While those people had enough votes to kill the measure, they did not have the decency to allow a discussion on its merits, nor did anyone of them advance a single reason why it should be choked. They simply gagged the meeting and counted the votes.\footnote{387}

Grinder reported Mayor Guthrie’s words on the council’s action: “I don’t know what their motives are and I don’t care. The smoke in Pittsburgh undoubtedly is a nuisance and it not only impairs the health but destroys property and mars the city by shutting out God’s sunlight to which everybody no matter what his rank or condition may be is entitled. ... “\footnote{388}

On Saturday October 27, The Post announced that the Chamber of Commerce had arranged a meeting at its own rooms to which it had invited the public. The object of the meeting at the Chamber of Commerce was to frame a resolution to present to the meeting of both council branches that evening at which an attempt to recall the ordinance was expected. After the resolution was passed, those in attendance marched together to council chambers.\footnote{389} Mayor Guthrie and mechanical engineer Julian Kennedy were to speak. Guthrie had asked civic organizations like the Chamber to take action in response to the failure to pass the smoke ordinance. The meeting was to feature expert discussion of smoke abatement on both sides and open public discussion. The council’s vote had been for indefinite postponement, which meant that no vote could be taken on the bill until the current council term ended in 1908.\footnote{390} The Monday morning Post carried
another article about the meeting. One of its subtitles was “Business Men Intend to Insist on Action” The Monday afternoon Chamber of Commerce meeting, which was expected to have the largest attendance of any meeting of the Chamber to that point, was expected to lead to a march on city hall. The Civic League would join the chamber in its confrontation with councils. Engineers and stoker manufacturers were to give testimony.391

Newspapers reported on the expected actions of the “combine”: “several members of the combine are disgruntled over the actions of the leaders in issuing orders to down the smoke measure and ...they will assert themselves tonight. Some of them are the men that voted in the affirmative when the vote was taken to indefinitely postpone action on the ordinance at the last meeting.” Weber had opposed the ordinance explicitly for the sake of the South Side mills. Yet, Tilbury explained that while explicit exclusion of mill furnaces would have made the law vulnerable to constitutional challenge, “legal authorities would not compel the enforcement of anything impossible and in this way the bill would not affect mill property.”392

President E. R. Walters of the Select Council had said on Sunday evening that he “favored a reconsideration of the Tilbury anti-smoke ordinance.” and planned to make a motion for reconsideration himself at the Monday meeting of the councils. Walters claimed that “many of the members of the Select Council voted for indefinite postponement of the measure because they did not understand it.” He said they did not oppose smoke abatement but had considered the Tilbury Bill “too radical.” Walters agreed with this assessment and wanted “to have a special committee take the matter up with persons whose interests will be affected by such an ordinance and try to reach a
solution that, while effective in giving the people relief, will not be too burdensome on
the factories as to the time the smoke consumers are to be installed.” This was the action
that many expected the Select Council to take at the evening’s meeting. Tilbury opposed
consideration of an amended bill such as might result from the deliberations of such a
committee.393

The Chamber of Commerce anti-smoke meeting came off as planned. At the
meeting Chamber of Commerce President Henry D. W. English, a staunch ally of
Guthrie, and a member of “that Damned Calvary Crowd” spoke in terms inspired by the
Social Gospel: “Lives of Pittsburghers are being destroyed, the lot of the working man
made harder.”394 Engineer Julian Kennedy, president of the Engineers’ Society said he
believed that “if the correct ordinance were passed, Pittsburgh would be free of 90
percent of its smoke within four months.”395

Those at the Chamber of Commerce meeting now knew that Councilman T. J.
Hawkins, who had voted against the bill, was willing to move for reconsideration of the
measure at the council meeting later that day.396 The crowd from the public meeting
expected that the experts they had brought with them would now be allowed to speak to
the councils. The Select Council, however, immediately voted down Hawkins’ motion
for reconsideration twenty-three to twelve.397 According to Grinder, the crowd
immediately resolved to “hold an indignation meeting” outside of council chambers.398
The council reacted to the strong emotion of the crowd and, in violation of the rules tried
to reconsider their vote.399 The new motion (to reconsider reconsideration of the bill)
passed twenty to eleven, with affirmative votes by some members of the combine.400 Yet
the council could not officially consider the same bill it had tabled, so it was necessary to
craft an amended version. They appointed a special committee to do so, in consultation with manufacturers and other interested parties, to be contacted both through open fora and individual meetings. The committee included two supporters of the Tilbury Bill, Tilbury himself and Charles Cavett, and the two who had strongly opposed it, Weber and Samuel Poster. Weber made it clear that the new ordinance that would come out of the committee’s efforts would be distinct from Tilbury’s bill: “A new anti-smoke ordinance will be prepared and introduced at the next meeting of Councils. It will not be the Tilbury ordinance, nor will it be known as the Tilbury ordinance. The Tilbury ordinance is legally dead.” Yet, Tilbury himself was now hopeful: “Things look favorable for obtaining of a smoke ordinance in Pittsburgh. I am willing to help in every way toward getting such a law no mater who is responsible for it.”

On November 3, the Post reported on the first meeting of this special committee, held on the previous day: “Councilmen Are Cowed – Vigorous Smoke Crusade Forces Most Advanced Step to End Nuisance.” This was perhaps a reference to Chamber of Commerce members having called councilmen “cattle” at the meeting. In response to the crowd’s anger, councilmen, who had previously opposed the ordinance, in blind obedience to the combine, launched into public-spirited tirades. Weber, the ordinance’s strongest opponent, went beyond smoke and began to hold forth on water purification. The Post took Weber’s Progressive posing seriously, though the councilman’s proposal to coin money from human sewage suggests that perhaps his change of heart was not genuine. According to the paper “The ‘combine’ councilmen literally fell over themselves in reversing their former attitude.” The paper argued: “That the combine councilmen have been cowed into seeing their duty through the giant proportions the
crusade has taken was evident from the time the committee organized, by electing Charles Cavett chairman.” The Post described the committee meeting as “such ... that people in the meeting room stuck pins into themselves to make sure they were not dreaming.”

Tilbury had earlier expressed reservations about meeting with manufacturers to craft an amended ordinance. Nonetheless, the Post characterized the appointment of the committee and the plans for the meeting as moves that had “cleared the murky atmosphere of delays, political intrigue, jealousy and inactivity that has characterized every move of the Republican “Combine” members of councils since the crusade against Pittsburgh’s smoke nuisance began.” E. R. Walters, president of the Select Council, who had opposed the Tilbury ordinance, scheduled a meeting with manufacturers earlier than had been requested by Weber, who had wished to give steel mill owners away in Europe time to return to Pittsburgh for the meeting. “Experts from other cities” were slated to attend the manufacturers’ meeting as would “every civic and commercial body in the city” including the Chamber of Commerce, the Engineers’ Society and the National Association of Stationary Engineers.407

On November 9 the Dispatch, a paper that advertised itself as “Pittsburg’s Only Independent Newspaper,” reported its expectations of the Select Council hearing. It expected that both manufacturers and real estate owners would be at the meeting in large numbers to oppose smoke abatement – real estate owners because “real estate prices are too high to permit them to give sufficient floor space to smoke-consuming apparatus” – or to provide boiler capacity to do the work required without making smoke. An ordinance different from the Tilbury Bill was expected to be put forward. W. H. Weber
held a conference with a national smoke abatement authority Professor J. A. Holmes, who had been in charge of a smoke abatement exhibit at the St. Louis World’s Fair, at which the two agreed on acceptable amendments to the Tilbury bill. The only amendment that was made public immediately was that “where it has not been demonstrated that smoke is preventable, the penalties shall not be enforced.” Weber was willing to support an ordinance amended in this way. Downtown firms argued in conferences with councilmen: “if required to adopt smoke prevention at their power plants, they would be forced to reduce the output of their works and consequently the number of workmen they employ. They cannot put in more boilers they assert because they cannot get the ground to locate them upon, the price of real estate being prohibitive.” E. R. Walters, President of Select Council, was characterized as “in favor of smoke prevention, but opposed to the rigid requirements of the Tilbury bill.” He expected manufacturers to come forward both in support and in opposition to smoke abatement.408

According to the Post of November 10, 500 invitations had been sent out to the public hearing on smoke abatement before the Select Council’s special committee on smoke abatement. South Side opposition to the ordinance had been strong. Boiler operators were reluctant to enlarge plants to provide sufficient boiler capacity. According to the Post, councilmen were changing their minds to favor smoke abatement. Some manufacturers were doing likewise but were concerned that all manufacturers be equally compelled.409

The Sun reported of the meeting: “many citizens of the municipality ... choked the doorways and jammed the passageways and made the visitors railing creak with protest.”410 Recognized smoke abatement experts and local manufacturers were the most
prominent speakers. Experts including Professor Holmes and Dwight T. Randall, another
government engineer, and Robert H. Kuss, engineer for the Civic Club in Chicago, spoke
at the meeting and argued for smoke abatement motivated by fuel economy. According
to the Post, 100 or so manufacturers and office building power plant operators were
present to argue that smoke abatement was possible and beneficial and that smoke
abatement appliances generally paid for themselves in two years. W. C. Reitz from
Pittsburgh Steel Company in Monesson said:

> There was no anti-smoke ordinance at Monessen, so when we started to eliminate
smoke at our plant in that town it was as a business proposition. We wanted to see
if it paid. It does pay. We have increased the efficiency of the plant. It doesn’t
cost so much to operate it. We get more power out of the same amount of coal.

Another manufacturer, Calvin Wells, “a pioneer in eliminating the smoke evil ... was
tendered an ovation” at the meeting.

Two hundred people attended the meeting which lasted over two hours and “not
one speaker gave expression to a dissenting thought.” Ordinance supporters explained
that the bill could not explicitly exempt mill furnaces and that experts acknowledged that
a small amount of smoke had to be made by puddling furnaces but that that could be kept
to a minimum. LHPA veteran Kate Cassatt McKnight spoke and contrasted the cost of
smoke-abatement appliances for manufacturers to the cost of smoke damage to others in
the community. “She showed the many ways in which smoke costs the people of
Pittsburgh millions yearly”: those who made money in the city went elsewhere to spend it
and made their homes elsewhere. The Post reported an exchange between Weber and a
pro-abatement manufacturer from the Schoenberger mills, John Z. Speer. Weber asked
Speer whether smoke could be eliminated in puddling and heating furnaces and Speer
said that he believed that 90% of it could be as long as more room was provided inside the furnaces. William McConway, one of the technical experts Carnegie had said he would want to nominate to a smoke-abatement/manufactured gas commission, claimed that his plant had a furnace that was smoke free 95 percent of the time. And he said he could do so with any boiler in the city.

On November 14, the Post reported “Councilmanic Combine Can No Longer Hold Out Against Sentiment.” The special committee was hard at work on a new ordinance. An amended ordinance would finally pass in December. It would include a “defense clause” suggested by nationally recognized smoke expert John Holmes to Dr. Weber. The solution to the need to exempt mill furnaces was not to be an explicit exemption but a clause to the effect that if the manufacturer showed that abatement was impossible for his kind of furnace, he would not be fined. This amendment calmed the fears that had been aroused in councils by the Tilbury Bill and the ordinance would pass in a matter of weeks. The new ordinance prohibited the “emission of dense black or dense grey smoke from any chimney except that of a private residence for more than eight minutes in any one hour.”

Another factor may have helped to move the ordinance along. By November 18, the Dispatch reported that the city was under unusually heavy smoke: “Pittsburg has had the most peculiar atmospheric conditions for the past three days in the history of the city.” Breeze was absolutely absent and “the smoke which rises from a thousand chimneys and stacks in Pittsburgh settles like a pall over the city ... the dark, muggy air has made street car traffic dangerous in the extreme. At night electric arc lamps are almost useless and street cars creep along with clanging gongs, afraid of collisions with a
vehicle or running down some unoffending pedestrian. Scores of serious accidents have been narrowly averted ... Railroads also have suffered from the fog and several small wrecks and collisions have occurred ... 

3.20 Enforcement of the 1906 Ordinance

After passage of the Weber Bill, Pittsburgh would enter a period during which civic pride meant pride in smoke abatement. William Holdship Rea, who had in 1889 been president of the Merchant’s and Manufacturers’ National Bank and a director of the Monongahela Insurance Company, would be the new city smoke inspector. The Reas were listed in the 1904 Social Directory and W. H. Rea’s wife was a member of the Twentieth Century Club from 1894 to 1904. Later anti-smoke experts would identify Rea’s administration as “a very efficient one resulting in a material reduction of the smoke nuisance in the city.” Yet Rea resigned on June 1, 1909, shortly after former president of the Select Council Dr. E. R. Walters was appointed director of the Department of Public Health to which Rea reported. Walters, who had opposed the Tilbury Bill, damned Rea with faint praise on the occasion of the turnover of the position: “He carried on the campaign of education, making frequent visits to plants and procured a few abatements.”

On August 1, 1909 Joseph Miner Searle took over the position of smoke inspector. Searle was a mechanical and mining engineer born in Scranton, Pa. In 1913 he would become president of the International Association for the Prevention of Smoke. Searle’s administration was much more inclined to prosecute than Rea’s had been, but he too combined an educational with a prosecutorial approach. Searle managed to convince councils to enlarge his force from three to six inspectors and in the first
eighteen months of his administration they made over 10,000 visits to plants. His force made inspections and advisory visits, and issued warnings but then entered complaints before Pittsburgh’s Aldermanic Courts if these means were unsuccessful. The Aldermen could then impose fines on the violators if they still refused to comply. Throughout 1910 the Division oversaw the installation of 539 “smokeless devices and appliances,” made 948 observations of stacks “smoking badly” which were subsequently given notice of violation and either taken to court or convinced to install abatement devices. Inspectors made 7,400 educational calls to firemen and engineers on the use of smoke abatement devices. Railroad companies had been pressuring their firemen to run the engines smokelessly and were working on an automatic stoker. In several cases railroad firemen were suspended or reprimanded after the Division reported multiple smoke violations to the railroad. The Junction Railroad was continuing to abide by its fuel restrictions. In 6 cases court dates were set for smoke abatement violators. Three were taken into Aldermanic Court. The Seely Apartments and the Hotel Anderson agreed to switch to coke as fuel after being taken to court in January 1910 and by February were operating without smoke. Three ice companies were identified as “flagrant offenders” in April. Two of them appear in subsequent months as having installed smoke abating equipment in subsequent months. The third, the Standard Ice Company, was fined by the Aldermanic Court and would appeal the decision in order to challenge the 1906 ordinance.

Searle’s activist approach had apparently worried manufacturers and those who saw smoke abatement as a threat to them. Searle began his 1910 report: “It is not the purpose of the City of Pittsburgh, through its Division of Smoke Inspection, to harass or
drive away the resident mill or factory operator, much less to discourage the prospective investor and manufacturer.” He argued that while coal was cheap in Pittsburgh because of low transportation costs, fuel would still be saved by smoke abatement and that, even more than this, mechanical stoking would save manufacturers money by saving labor costs. Searle recognized trends in heavy industry that would eventually make industrial abatement of heavy black smoke the easiest part of Pittsburgh’s air pollution problem: “Machinism has for the past two decades been rapidly coming to the help of man in many lines of trade and is supplying deficiencies and derelictions of duty.” Searle regarded work against boiler smoke as having been largely successful in Pittsburgh and he believed it was time to extend this success to manufacturing furnaces:

The time has now arrived when a determined campaign must be inaugurated against the smoke produced by our metallurgical furnaces, many of which emit dense black smoke almost constantly. By pursuing the same vigorous and practical policy that has marked the progress of the City of Pittsburgh’s successful campaign against the smoke from boiler stacks and chimneys, the ‘furnace’ smoke fallacy will soon be exploded.

Searle described an exemplary puddling plant outside the city, which he had visited, that was producing no smoke though the use of powdered coal.

The Court of Quarter Sessions of Allegheny County took up the Standard Ice appeal from the aldermanic courts. Judge J. D. Shaffer on March 3, 1911 overturned the ordinance contending that “... a City, by way of regulations to promote the health of its inhabitants, cannot especially if it is in a manufacturing city using bituminous coal, forbid the use of furnaces stoked in the way that has hitherto been in ordinary use, and ... an ordinance which undertakes to do so is unreasonable ...” Nonetheless, the court suggested that the city approach the state legislature to ask for authority to regulate
smoke under such an ordinance. Searle claimed that “Up to this time the work accomplished by this division had been most gratifying and showed beyond all question of doubt that it would be possible for Pittsburgh to operate with 75% less smoke than had been caused prior to the passage of this ordinance.”

As a result of the declaration that Pittsburgh’s ordinance was invalid, the Pennsylvania legislature flirted with the possibility of regulating smoke on the state level. Just after the March 1911 Standard Ice decision, a state bill was prepared that defined production of “black or dense gray” smoke “within the corporate limits of several cities,” for more than six minutes per hour, as a nuisance. The bill “stirred up a great deal of opposition, it being contended that it was too drastic and would work a hardship upon the mills and manufacturers” and so was withdrawn. The opposition generated by this bill made it politically possible for the state to explicitly grant Pittsburgh the right to regulate smoke. This move was seen as a lesser evil by opponents of abatement. A new bill was substituted giving second class cities (a category that had long included only Pittsburgh) the authority to regulate smoke. This bill passed on June 6, 1911.

Pittsburgh’s new smoke ordinance was passed in September and Searle would resume his position as smoke inspector, on September 22, 1911. It was clear that vigorous enforcement was necessary to keep Pittsburgh’s smoke makers in line. Between early March and late September, “many plant managers, who had previously regulated their furnaces so as to produce practically smokeless stacks, permitted the old smoky conditions to return.”

Despite Searle’s conviction that heavy industrial smoke should be addressed, the new 1911 ordinance explicitly exempted mill puddling and heating furnaces. In spite of
the continued resistance to regulation of mill furnaces in Pittsburgh, passage of the state enabling act bolstered the hopes smoke abatement proponents held for Pittsburgh. No longer would the specter of constitutional challenge haunt every smoke ordinance effort. Yet this optimism was tempered, at least for Searle, with a conviction that ultimate abatement success depended on the regulation of large mills. In 1912 Searle asserted that half the job was already done and that “there are but few large plants among our flagrant offenders remaining.” In the same year, Searle would be ready to proclaim:

The time has about arrived when I might venture a prophecy as to the period necessary for the final clean-up of the city. With a full complement of men, with the ordinance amended as I have frequently urged, and with the support of my superior officers and the City Council, I will venture to say that two years more will complete the elimination of at least ninety per cent (90%) of the smoke emission into which the city was accustomed three years ago.

At this point he was still be awaiting amendment of the ordinance to include industrial furnaces.

### 3.21 The Pittsburgh Survey

During the same years that Pittsburgh’s progressives believed they would solve its smoke problem through vigorous application of ordinances, national critics would point to the existence of apparently less tractable problems in the city. Pittsburgh had become a national symbol of what was wrong with urban industrial life. In 1907 the city became the focus of the landmark sociological study *The Pittsburgh Survey*. The Survey complained about the striking contrasts between Pittsburgh’s advanced business organization and its appallingy primitive social organization. By examining the Survey,
and both local and external responses to it, we can come to understand the way smoke was regarded in relation to Pittsburgh’s other urban problems.

The Survey was inaugurated in Pittsburgh, at first perhaps indirectly, through the efforts of the same individuals and organizations who had deposed the Magee-Flinn machine and agitated for the 1906 smoke ordinance – “That Damned Calvary Crowd” linked to the Kingsley House, the Chamber of Commerce, and the LHPA’s daughter organization, the Civic Club. In 1901 the Civic Club had undertaken an investigation of justice for juveniles in Allegheny County and in 1903 had brought Philadelphia expert Alice B. Montgomery to give a talk on “The Importance of a Separate Court for Juvenile Offenders.” Members of the Civic Club convinced Montgomery to move to Pittsburgh and become the chief probation officer for Allegheny County’s new juvenile court. Montgomery was well connected with the world of social work and social reform. She was familiar with the results of a social survey of Washington D.C., “Next Door to Congress” conducted in 1902 by the Charities Publication Committee (part of the New York Charity Organization). In 1905 she wrote to Robert Devine, editor of the journal Charity and the Commons to ask if he would consider sending an investigator to examine social and industrial conditions in Pittsburgh.

Kellogg said about his response to Montgomery’s request, “We felt that Pittsburgh bore somewhat the same relation industrially to the country at large that Washington did politically.” As Kellogg would later write in one of the Survey volumes (Pittsburgh District Civic Frontage), Pittsburgh was an example of national problems and
if the great industries of the country are to be owned by great bodies of stock holders scattered all over the country – or if we are to change that system of ownership and control – then on the shoulders of a national public opinion must rest the responsibility for sanctioning or for changing the terms of work and livelihood which accompany industry. As a basis for that national public opinion facts are needed; such facts as the Pittsburgh Survey endeavored to bring to the surface.449

In early 1907 the plan for the Survey was presented to local progressives who responded enthusiastically.450 Paul Kellogg, managing editor Charity and the Commons, under Devine, would take up the work. Originally the Survey, conceived as work for one investigator, received modest funds solicited from the Pittsburgh reform community by men like Mayor Guthrie and H.D.W. English, the chair of the Chamber of Commerce, as well as industrialists Henry J. Heinz, Wallace Row and Benjamin Thaw. In 1907 Kellogg asked the Civic Club for funding. Former LHPA leader Kate Cassatt McKnight appointed a committee, which, after discussions with Kellogg, agreed with his recommendation that a more extensive study be conducted by a larger staff from Charities and the Commons. Kingsley House, connected from its founding to the New York social work community from which the Survey drew its organization, would provide housing for the visiting investigators. After a preliminary investigation, New York’s Russell Sage Foundation became interested in the project and provided generous funding.451

In 1907-08 a group of experts in social work dispersed throughout the city to study aspects of its social organization. They also studied how environmental conditions and economic structures shaped social life. Investigators included Robert A. Woods, a Pittsburgh native who had moved to Boston, Florence Kelly, formerly of Chicago’s Hull House, University of Wisconsin political economist John R. Commons and his graduate student John Fitch, and lawyer and sociologist Crystal Eastman. These figures would be
among the authors of its major publications. Seventy-four researchers in all worked on the project. Many came from outside the city but a number of them were local as well and prominent in Pittsburgh reform community. Research was conducted between summer 1907 and summer 1908. These professionals presented the results of their researches in magazine articles in venues like Charities and the Commons its successor The Survey, in speeches and exhibits and in six books published between 1909 and 1914. The magazine was an important venue for publication of the Pittsburgh Survey’s results and published 35 articles related to it in the first three months of 1909 alone.452

According to Stephen Turner, the Survey was “the first major attempt to investigate the entire social life of a community in the United states by means of team research.”453 Paul Kellogg saw the Pittsburgh Survey as the prototype of a movement – “reform research.” Kellogg wanted “professional surveyors,” used “social work” to mean “comprehensive community reform,” and saw the social worker as a “social engineer.”454 Its roots were in the investigative journalism of Jacob Riis and Lincoln Steffens as much as in any academic field.455 The kind of work embodied in the Survey was split between scientific sociology, soon to be regarded as a “pure science” and to be funded, as scientific research, by Rockefeller philanthropy, and social work which came to be focused on individual treatment. Work such as the Pittsburgh Survey was later criticized as the amassing of “propaganda” and in the interests of “publicity” rather than as research conducted in the spirit of “discovery.” In later years Kellogg would resent such characterizations but hold fast to the aim of reform research.456 Kellogg’s aim was to inspire local action to ameliorate the problems the Survey would expose.457
The Survey released its results locally in November 1908. A Monday evening meeting at the Second Presbyterian Church included presentations by Survey researchers and local reformers. Chamber of Commerce president English characterized civic reform, as Andrew Carnegie had characterized smoke abatement, as an intellectual problem: “Pittsburgh has more gray matter per square inch than any other city yet it has been preoccupied with turning this gray matter into dollars ...” English believed that the problems of the Survey could be eliminated if Pittsburgh’s best engineers would devote an hour or so a day to solving them.\textsuperscript{458} Survey results were also offered in an address at the joint meeting of the American Civic Association and the National Municipal League held in Pittsburgh on November 16, 1908 and were distributed as a pamphlet in 1908 at the Pittsburgh Civic Exhibit.\textsuperscript{459} The exhibit, at the Carnegie complex in Oakland, included such eye-catchers as a “frieze of small silhouettes three inches apart stretching in line around both ends and one side” of the exhibit hall to represent Pittsburgh’s typhoid death toll.\textsuperscript{460} Environmental reform and city planning were central themes at the conference. Attending the meeting were important national figures in social work and in the new profession of urban planning.\textsuperscript{461}

Kellogg’s address from the conference was published in \textit{Charities and The Commons} for January 1909. In “Civic Responsibilities of Democracy in an Industrial District” Kellogg derided the “haphazard development” of Pittsburgh’s “social institutions” when compared with the “organic development of its business enterprises.” This earliest summary of results recommended administrative consolidation of local communities including “all districts that can be reached by city workers, by subway, steam or surface lines.” It gave as a motivating example for such a change the difficulties
of regulating municipal food and milk supplies if inspections were limited to substances only upon their arrival at city limits. It also pointed out the similar difficulties in regulating water supply. Kellogg complained about ward control of taxation and the unequal burden of taxation leading to unequal quality of public schooling. He complained of the unregulated and unorganized system of private hospitals in the district which left “a great belt of river wards, thickly populated, without a convenient hospital – wards in which disease was rife.” He compared this system to the “centralized scheme of surgical organization instituted by the Carnegie Steel Corporation ... which reaches from first aid box, through well-placed hospitals in each of the mill towns ... ” Kellogg complained about lack of factory inspection, the backward hygienic conditions at public institutions for children as well as inadequate water filtration and typhoid death-rates ranking consistently in the nation’s top three. He lamented the abundance of privy vaults, and poor sewage and garbage disposal and “the need for more and better shelter.” Also, he pointed to the appallingly high rates of industrial accidents in Allegheny County and the system of industrial espionage put in place by even those employers attempting to solve other problems, that made the organization of unions, for the increase of low wages and reduction of long hours, impossible. Pittsburgh’s smoke was not a major target of his concern.

Book length publications of the Survey expanded on each of Kellogg’s themes. Four volumes, Elizabeth Beardsley Butler’s Women and the Trades, Crystal Eastman’s Work Accidents and the Law, John Fitch’s The Steel Workers and the compilation of essays Wage-Earning Pittsburgh, focused primarily on workplace and economic issues closer to “social justice” but touching on “environmental reform.” Margaret F.
Byington’s *Homestead: Households of a Mill Town* and especially the edited volume *The Pittsburgh District: Civic Frontage* focused more closely on environmental matters. Byington’s study, nevertheless, despite a careful consideration of living conditions, took family budgets as the factor in working class life to which all else is reduced. Both social and environmental conditions were measured in her study only by what they might cost the family in dollars.

Some of the *Pittsburgh Survey* authors recognized smoke as a ubiquitous presence in Pittsburgh, and in poor neighborhoods in particular. Although they applauded efforts toward smoke abatement, there is no separate essay or chapter devoted anywhere in the *Pittsburgh Survey* to the smoke problem. F. Elisabeth Crowell, writing about Painter’s Row in the *Civic Frontage* volume regards smoke as an almost unchangeable backdrop to other improvable environmental conditions. She writes: “Dirt and noise are inseparable adjuncts to life in a mill district, deplorable, but unavoidable; but workers in the mills need not necessarily be deprived of sufficient light and air, such as it is, and water, and the common decencies of life.” She reported that during 1908, after some of the *Survey*’s results were published, a stockholder of United States Steel, who owned property described in the survey (Painter’s Row), adjacent to an iron mill they had taken over, made major improvements. Crowell reports on her next visit to Painter’s Row: “Eight months later I inspected Painter’s Row for the second time. I found the noise as incessant, the smoke and dust as penetrating, as before.” But she reported on gleeful tenants showing her new and well-cared for indoor plumbing fixtures that had significantly improved life there since her last visit.
Nevertheless, despite the involvement of some among the elite in bringing the Survey to the city and both in helping it do its work and in later implementing some of its recommendations, popular reaction to it was strongly negative. Between December 26, 1909 and April 24, 1910 the Pittsburgh Gazette Times published a series of articles “Pittsburgh: A City to Be Proud Of” as its response to the survey. Gazette-Times writer Robert W. Jones said “professional investigators from other cities” had chosen “the worst cases from each of a variety of industries, combining them and then alleging gross negligence on the part of the Pittsburgh employer.” The articles offered the employers’ side of the questions of industrial accidents and company health, welfare and housing provision for workers, based on information provided by corporations like Carnegie Steel, Westinghouse Electric, American Bridge and Pittsburgh Coal. As Bauman and Spratt point out, Pittsburghers felt particularly threatened by the Survey’s indictments in the aftermath of the (Wall Street) Panic of 1907 and the disastrous flood of the same year. Some feared that the Survey’s criticisms would exacerbate Pittsburgh’s economic vulnerability “by widening its perceived competitive disadvantage with lake cites such as Cleveland and Gary ...”

According to Bauman and Spratt, “The Pittsburgh Survey pointed in two directions” – one was “environmental reform” and the other “social justice.” Bauman and Spratt have argued that “local elite and middle-class reformers” were receptive to the Survey’s recommendations for environmental reform but “appalled” by those aimed at social justice. Yet, it is clear from the Survey’s presentation of its results that social justice concerns were at its heart. Devine summed up the Survey’s chief findings about Pittsburgh as centering on “incredible overwork ... low wages ... [and the] destruction of
family life.” Those who conducted the Survey had expected negative reaction, despite the support they had received from progressive elements of local elites. They saw themselves as contending with “selfishness and inertia, ignorance and greed” in Pittsburgh and elsewhere in America.” Looking back from 1914, Kellogg also took pride in what the Survey had done to promote local reform efforts. Kellogg responded to Gazette Times series in a Survey magazine article also called “Pittsburgh: a City to Be Proud Of.” According to Bauman and Spratt “He noted the ‘belated hostility’ of Pittsburgh’s press, the steel industry ties of the Gazette owners and the papers’ blatant misrepresentation of Survey findings.” Yet Kellogg, as Bauman and Spratt note, also celebrated the way in which the Survey had animated local elites to pursue solutions to some of the problems it outlined, particularly those having to do with quasi-environmental conditions like housing and city planning.

City planning, an effort gathering interest in cities around the country, was a perfect focus for such interests, and it was city planning to which Pittsburgh turned in response to the Survey. In the aftermath of the conference that included the initial presentation of Survey results, Mayor Guthrie launched a concerted effort to promote city planning in Pittsburgh. He established the Pittsburgh Civic Commission (PCC) in January 1909 (when he was about to leave office in March) as an explicit response to the Survey’s environmental recommendations. Guthrie appointed Chamber of Commerce president Henry D. W. English as its chair. English viewed businessmen as central to reform and the commission allowed progressive businessmen to take a more direct role in structuring Pittsburgh’s environment and planning its future. An article in Charities and the Commons celebrated the Commission:
That Pittsburgh has not only had the courage to look within; that the head of the city, realizing the conditions has had the courage to form a commission with a view not only to face these conditions but to change them places Pittsburgh in the front rank of American cites showing a real and practical desire for civic and social improvement. 471

While the Survey strengthened a movement for ameliorative environmentalism in the city, it took on little significance in the city’s electoral politics. In the 1909 mayoral election neither Republican candidate William Addison Magee, nephew of the late political boss Christopher Lyman Magee and son of councilman William Addison Magee, Sr., nor his progressive Civic Party opponent, William H. Stevenson, who had spoken out during the campaign for the 1906 smoke ordinance, made the Survey an issue. 472 Stevenson had support from “the Voters’ League and East End churches” and represented his campaign as “reform versus the ring.” According to Bauman and Spratt “Magee attacked Guthrie’s ‘extravagant public works’” and his “‘Puritanism’ ... [but] in reality both candidates pledged to restore civic pride and promised efficient ‘practical government’” 473 But Magee won the labor vote and the election. 474 After Magee’s victory, he whole-heartedly took up the push for city planning inaugurated by Guthrie. Progressives resisted Magee’s efforts, however, since they disapproved of his efforts to inaugurate programs before expert study was complete. (Magee was not willing to wait for the completion of the report on a city plan commissioned from Frederick Law Olmstead Jr., son of the Central Park designer, before he began to hand out contracts.) In November 1910 Magee oversaw the creation of a new 1911 city charter which made a City Planning Commission, which replaced Guthrie’s Pittsburgh Civic Commission, part of city government. Nonetheless, many of the urban planning programs put into effect through the 1930s had their roots in the response to the Pittsburgh Survey. 475
In the meeting at which the Survey results had first been presented to Pittsburgh’s reform community, English had used smoke abatement as an example of what reform could accomplish in Pittsburgh: “I will admit that we can settle [other problems raised by the Survey] in five years as we are going to settle the smoke question in the next three.” According to Bauman and Spratt, “Local officials claimed they were already tackling the environmental problems that the Survey exposed.” Joel Tarr discusses Charles M. Robinson’s “Civic Improvement Possibilities of Pittsburgh” which claimed that smoke had been “tackled bravely by the Chamber of Commerce” and expressed confidence in the current ordinance and those who would enforce it. According to Tarr, however, “The Survey investigators miscalculated the scope and severity of the smoke problem and underestimated the effort that would be required to correct it.”

Nonetheless, smoke abatement had become a symbol for Progressive reformers of the positive change of which Pittsburgh was capable. Yet, in general, environmental improvement would be used as a substitute for social improvement. As we will see in the next chapter, smoke abatement would come to be seen by Pittsburgh’s elites as the city’s “first fundamental need,” of greater importance than the right to organize or the elimination of the twelve-hour day.

3.22 Conclusion

Following Pittsburgh’s natural gas period, technological, social and cultural transformations reshaped Pittsburgh’s civic identity. The same transformations affected both the conditions and levels of smoke production and, independently of this, helped to create new attitudes toward smoke. Railroads created demand for large batch steel and
the semi-skilled jobs in new steel mills drew large numbers of immigrants to Pittsburgh’s mixed use and mixed class urban neighborhoods. As mills relocated to new neighborhoods away from former strongholds of artisanal working class culture centered around the iron puddler, they contributed to the fragmentation of the working classes. Residents who could afford it fled the crowding and intensification of industry to semi-rural suburbs. With suburbanization came greater attention to the aesthetic and health conditions of domestic life, and with this, came efforts to provide both suburbs and, somewhat later, urban neighborhoods with municipal amenities. Both nationally and locally, expansion of municipal amenities was accompanied by an increasing interest in reforming environmental conditions believed to impinge on health. “Municipal housekeepers” extended environmental improvement from home to community. Municipal housekeeping both contributed to and expressed a fundamental reconstitution of the categories of luxury and necessity as they impinged on environmental matters. In earlier years, environmental cleanliness had been regarded as a luxury of feminized elites. Now, middle class housewives argued that such cleanliness was a necessity to health. Pittsburgh’s Ladies Health Protective Association evaded charges of sentimentality and frivolity that had frustrated earlier efforts to oppose smoke in Pittsburgh. Arguments for smoke abatement as a health necessity now stood alongside rationales highlighting cleanliness as a production value and an attractive environment as an economic good. Voices emerged as early as 1892 and multiplied dramatically by 1906 asserting that health, domestic comfort and the value of personal property were legitimate goods worthy of legal protection. By 1900 the Pittsburgh Chamber of Commerce argued for the importance of smoke abatement to continued prosperity, which could best be
achieved through economic diversification. Repeatedly private citizens, often, though not always, linked with reform groups, lodged nuisance complaints in the courts against polluters. In the Jones and Laughlin Red Ore Dust Case they caused the corporation to spend hundreds of thousands of dollars on abatement technology and, at least until charges of contempt of court were dismissed, to pay thousands of dollars of fines.

Pittsburgh’s newspapers in 1900 and again in 1906-07 campaigned against smoke, and these campaigns illustrated the shift in values that had taken place in the wake of the natural gas period. They sought to show both why smoke abatement was necessary and that it was possible. They also highlighted persistent ambivalences about smoke among segments of the city’s population, especially particular industries and municipal agencies – publically praised for abatement efforts one year and legally censured for failure to comply with smoke ordinances the next. In spite of the growing consensus that smoke abatement was desirable, from the public relations campaign of the political machine in the 1890s to the anti-smoke “indignation meeting” instigated by Chamber of Commerce members in 1906, Pittsburghers remained consistently reluctant to regulate the sources of smoke that made Pittsburgh the “Smoky City.” Even after the Pennsylvania legislature explicitly granted the city the right to regulate smoke, ordinances exempted iron and steel furnaces.

Early on smoke abatement became a popular progressive cause, a subject about which near consensus could be predicted, even if it did not yet exist. Smoke took on this role in a way that other reform targets could not in Pittsburgh. This is illustrated by the local reaction to the criticisms of the city generated by the Pittsburgh Survey. By the time of the passage of a more effective smoke ordinance for the city in 1907, Pittsburgh was

329
the butt of national criticism for other shortcomings of its civic character. The Pittsburgh Survey, although it was brought to the city in part through the efforts of local reformers, derided the city for its lack of attention to social and environmental conditions. It compared the city’s low level of social development with its high level of industrial development and found Pittsburgh wanting – much in the way that earlier travelers had been disappointed in the city itself, having come with expectations raised by tales told abroad of Pittsburgh’s manufacturing might. The Survey’s criticism, however, met with a different Pittsburgh than that criticized in the mid-nineteenth century. Both local and national cultural and technological changes had transformed the city’s capacity to respond to criticism grounded in conceptions of universal civic standards. These included, locally (1) the realization that even steel-making need not depend on bituminous coal, (2) the decline of working-class culture as the dominant element in the shaping of Pittsburgh’s cultural life, and (3) nationally, the re-making of conceptions of virtue and human good to include, rather than to exclude explicitly, domestic and bodily comfort and the enjoyment of moveable property. In Pittsburgh this trend was accompanied by a concomitant expansion of the economic realm beyond manufacturing profit to both movable property and real estate. Local and national transformations in both gender and class ideologies and in social relations undergirded these changes.

Notes

1. Couvares, The Remaking of Pittsburgh, 95-6. This is a central theme of Couvares’ book. He does not, however, discuss links between these cultural changes and changing attitudes toward smoke.

3. Harrison D. Mason, Some Pittsburgh memories; incidents and reminiscences, with a little history intermingled, of seventy years residence in the city at the forks of La Belle Riviere (Crafton, Pa.: Cramer Printing and Publishing Co., 1924): 71.


7. Ingham, Making Iron and Steel, 72.

8. Ingham, Making Iron and Steel, 170-1; Rishel, Founding Families, 167-68.


10. Ingham, Making Iron and Steel, 170.


14. Suburbs had better access to public utilities because city services went to those who could pay. The twelve-hour day and the long turn kept poor families close to the mills. Working-class women’s housework burden remained heavy because of increased crowding and overtaxing of inadequate municipal services in poor neighborhoods. In 1879, Pittsburgh public works officials remarked that rising standards of cleanliness among the middle class took water from the poor. Kleinberg, Shadow of the Mills, 88–89, 303–9.


24. [Cushing et al.], *History of Allegheny County*, 260.

25. [Cushing et al.], *History of Allegheny County*, 260.


33. [Cushing et al.], *History of Allegheny County*, 38.


40. [Civic Club of Allegheny County], *Fifty Years of Civic History*, 4; Stradling, *Smokestacks and Progressives*, 42.


42. *NLT*, May 16, 1891.

43. *NLT*, May 23, 1891.

44. *Proceedings of the Engineers’ Society of Western Pennsylvania* 1 (1881).

46. Proceedings of the Engineers’ Society of Western Pennsylvania 8 (1892).
52. Ingham, Making Iron and Steel, 51.
53. Ingham, Making Iron and Steel, 151.
54. Proceedings of the Engineers’ Society of Western Pennsylvania 1 (1881).
64. Fleming, History of Pittsburgh, 151.
73. While the LHPA’s emphasis on health protection linked it to a tradition of maternal “protective” women’s reform focused on the less fortunate, the organization was clearly ambivalent about such a stance. Pittsburgh’s elite women had been involved in charitable efforts on behalf of the poor for decades. (“Representative Women,” Pittsburg Times, February 2, 1892.) The LHPA distanced itself from this tradition and from the “sentimentality” associated with it by targeting health concerns that linked rich and poor rather than those that focused on the poor alone. Despite their concern to appear “unsentimental,” the women of the LHPA did demonstrate some sensitivity to the needs of the poor. Nevertheless, attributing the LHPA’s motives to a truly selfless concern for the poor is unwarranted. They argued, for instance, that municipal garbage collection be free of charge since “there [were] thousands of families who cannot, by the most rigid economy, spare even $1 a month for this purpose.” “Health Protection – Annual Meeting of the Ladies’ Health Protective Association in Pittsburg: Smoke and Garbage Nuisance,” Pittsburg Press, April 28, 1892. For example, the LHPA regarded piles of refuse in poor neighborhoods as “hotbed[s] for disease germs.” Under prevailing popular views of health, germs were thought to be transmissible through the air and through street dust. Tomes, The Gospel of Germs, 95–98. Anyone in contact with air that had once circulated over such “hotbeds” was a potential victim of the health hazards of garbage, another of the organization’s three targeted nuisances. “Health Protection – Annual Meeting,” Pittsburg Press, April 28, 1892; Kleinberg, Shadow of the Mills, 50, 67–69.

74. Consumption in Pittsburgh shared the severity of cases induced by occupational dust exposure according to Sutton.

76. The first series of the Index-Catalog of the Surgeon General’s Library lists a number of articles published between 1870 and 1892 relating smoke and health. In some cases article titles relate smoke and health directly. In those cases in which health is not explicitly mentioned, their inclusion in the Index-Catalogue indicates that, at least by 1892, when the relevant volume of the series was published, the editors

Series 2 begun in 1911 listed more publications from the period before the Engineers’ Society meeting. These included the report of the Citizen’s Association of Chicago, “Report of the Committee to the Executive Committee,” May 1889 (Chicago, 1889): which had been consulted by LHPA members prior to the meeting. It listed 13 articles published before 1892 on any aspect of smoke with 8 in English. Of these 8, at least 6 appeared in journals or proceedings devoted to medicine or public health. Many more articles, and more articles with titles concerned with smoke and health appeared in the period between 1900 and 1910. Library of the Surgeon-General’s Office (U.S.), Index-Catalogue of the Library of the Surgeon-General’s Office, United States Army (Washington: G.P.O., 1880-1932).


78. Pearson, Philosophical Transactions 11 (London 1813): 120. Early on, Pearson’s view was accepted in Britain and France and resisted in Germany. Gregory, Edinburgh Medical and Surgical Journal 36 (1831): 389. Koschla, Virchow and Henele thought lung coloring was from blood or that “inert foreign particles” could not penetrate the lung. In 1860, however, a German researcher, Traube, confirmed Pearson’s work in the case of charcoal pigment. Traube, Deutsch Klinik 12 (Berlin, 1860): 475. The first confirmatory animal experiments were carried out by Knauff in 1867 and repeated by Konradi in 1869. Knauff, Virchows Arkiv 15 (1866); Konradi, Untersuchungen über den Schwarzen Farbstoff in Lunge (Dorpat, 1869). Klotz, “Pulmonary Anthracosis.”

79. J. T. Arlidge, “On lung-disease from inhalation of dust” British and Foreign Medico-chirurgical review 61 (1875): 433-444. In 1876 another physician at the same infirmary Dr. J. Alexander Ross, wrote about lung diseases caused by the dust exposures of potters. He linked these diseases to “The inhalation of mechanical and chemical irritants, an over-heated atmosphere and a deficient supply of oxygen” giving rise to “chronic catarrhal pneumonia” in some cases and to a more serious “fibroid disease of the lungs” in others and speculated on the connection of these problems to the development of tuberculosis. J. A. Ross, “Diseases of the Lungs affecting those who work in Dusty Atmospheres,” The Dublin Quarterly Journal of Medical Science 51 (1876): 93-106.

80. Long-term accumulation was recognized to be necessary to give rise to disease and different periods of accumulation were necessary for different kinds of dust.
81. As a result, deposits of carbon were found in the adult lungs were “disregarded as having any association with respiratory diseases or clinical symptoms during life.” Klotz, “Pulmonary Anthracosis.”

82. W. B. Canfield, Chief of the Chest Clinic at the University of Maryland in Baltimore, writing in the American Journal of the Medical Sciences reviewed research on dust diseases beginning with Ramazzini. He too noted the “discoloration produced by the foreign particles deposited in the pulmonary tissue” and distinguished the characteristics of tuberculosis in comparison to other lung diseases on pathological examination. William Buckingham Canfield, “Inhalation of Dust and Pulmonary Disease,” The American Journal of the Medical Sciences 104 (1892): 686-691.


86. Cohoe, “The Relation of Atmospheric Smoke and Health,” 36.


88. Some, like German researcher C. Glinzer, “appreciate[ed] [smoke’s] twofold qualities” claiming that smoke did have germicidal properties and that ‘Obnoxious vapors and other harmful products carried by the air are absorbed and retained by the material elements of smoke, and are finally carried away harmlessly by the rain, so that smoke, on the contrary, can be stamped as a purifier of the atmosphere and a benefactor of the human race.’ Glinzer went on, however, to express ambivalence, though he did not seem able to adduce any strong evidence for smoke’s health dangers: “. . . it is only a question of which influence is the stronger. I believe we can safely depend on our instinct and this tells us decidedly that smoke does not agree with us.” C. Glinzer “Address on the Smoke Nuisance and its Abatement before the Industrial Society of Hamburg” 1890, as quoted in Cohoe, “The Relation of Atmospheric Smoke and
Health.”


92. Stradling, Smokestacks and Progressives, 43.

93. [Cushing et al.], History of Allegheny County, 25.

94. Rend also answered Sutton’s claim that smoke’s damage to vegetation indicated that it also damaged human health. Rend asserted that it was not smoke but “the fumes of sulphur, the acids” that killed vegetation saying: “Suppose you eliminate the smoke, the gasses still remain.” Rend argued that sulphur fumes rather than soot killed vegetation and that smoke reduction would eliminate particulate carbon not gases. Proceedings of the Engineers’ Society of Western Pennsylvania 8 (1892): 46.


100. “Many in Favor of Smoke,” Pittsburgh Post, Feb. 17, 1892.


103. Its inventor claimed that this furnace had been proven in Chicago to be most effective for smoke abatement of all those tried. The paper claimed that the two boilers at the factory were “fired hard all day” and “no smoke [was] emitted from the stack.” and that the fuel savings was thirty-three percent. A company official claimed that it would “put the furnace in any place at our own expense, guaranteeing to accomplish all the above claims before it need be paid for and if it fails to do it we will remove it and replace the boilers and settings as we found them at our expense.” “The Smoke Problem Solved,” Pittsburgh Commercial Gazette, Feb. 20, 1892.

104. “Reform in Smoke,” NLT, Feb. 27, 1892.


111. Daly’s “name ... [would be] associated with considerable notoriety on account of the exposure of the beef scandal which developed during and after the Spanish-American War.” Diller, Pioneer Medicine, 171-2. Both Sutton and Daly were leading figures in Pittsburgh medicine and were among the incorporators of the Western Pennsylvania Medical College (which became part of Western University of Pennsylvania, later University of Pittsburgh, in 1892). Killikelly, History of Pittsburgh, 297.
115. Proceedings of the Engineers’ Society of Western Pennsylvania 8 (1892), 345.
120. Proceedings of the Engineers’ Society of Western Pennsylvania, 8 (1892): 66-77.
121. Dempster had been eager, at the February meeting, to make sure that abatement rather than abolition of smoke was being suggested, and who had introduced Mr. Rend, the strongest pro-smoke speaker to the group as a representative of an anti-smoke society in Chicago.


129. Committee on Smoke Prevention, Engineers’ Society of Western Pennsylvania, “Report of the Committee on Smoke Prevention” Proceedings of the Engineers’ Society of Western Pennsylvania, 8 (1892).

130. In 1895 the Common Council had 47 members – Kelly, Handbook of Greater Pittsburg, 2; I have been unable to find a Common Council total for 1892, though I could calculate one.

131. Ingham, Making Iron and Steel, 164.


133. Ingham, Making Iron and Steel, 164.

134. Ingham, Making Iron and Steel, 165.


139. While councils remained a central means of machine control over city government, organizational changes in the 1880s made this control somewhat less direct. In 1887 the city government was reorganized so that administrative control would be exercised through executive departments, such as Public Works, Public Safety and Charity, rather than through committees of councils. Tarr argues that this strengthened Magee’s machine. Nonetheless, as the episodes recounted here make clear, machine manipulation of councils was still an important way to get things done. Tarr, “Infrastructure and City-Building,” 233; Ingham, Making Iron and Steel, 165.

140. Ingham, Making Iron and Steel, 165.

141. Ingham, Making Iron and Steel, 164.

142. Ingham, Making Iron and Steel, 165.

143. Ingham, Making Iron and Steel, 165.


146. He was by that time also a member of the elite Duquesne Club to which both William Metcalf and H. K. Porter belong and of the similarly elite Sportsman’s Association of Western Pennsylvania of which W. H. Daly and many of Pittsburgh’s most prominent men were members.

147. Along the Allegheny River between 13th and 14th Street.

148. He had been trained as a hatter and was proprietor of the leading downtown “hat and furnishing” store. Boucher, *Pittsburgh and Her People*, vol. 4, 82-83.

149. Boucher, *Pittsburgh and Her People*, vol. 4, 82-83.

150. *Municipal Record: Proceedings of the Select Council, City of Pittsburgh* 24 no.25 (March 14, 1892).

151. William A. Magee was also uncle of future mayor of Pittsburgh William Addison Magee, elected to two terms, in 1909 and in 1922.

152. Oakland was the fourteenth ward.


157. There seem to be no distinguishing characteristics of those who voted against the ordinance. *Municipal Record: Proceedings of the Common Council, City of Pittsburgh* 24 no. 25 (March 14, 1892).


161. Marketing strategies of the coke makers in the nearby Connellsville Coke Region point to efforts at coke production within the city in the 1840s and into the 1850s. According to Kenneth Warren, in the early days of coke-making in the Chestnut Ridge district described by Metcalf, rural coke producers were more interested in the Cincinnati market than in the much closer Pittsburgh market because “Pittsburgh already had its own coke ovens dotted along the Monongahela that obtained their coal from ‘city ‘ mines and served both the foundries and forges . . . .and the city’s crucible steel works.” Kenneth Warren, *The American Steel Industry, 1850-1970, a Geographical Interpretation* (Oxford: Clarendon Press, 1973): 21, 36.


167. The same atlas shows the Park property on the Allegheny River near Thirty-first Street as containing “gas works.” Several blocks away is the Pittsburgh Coke Gas Works. Both these operations presumably were manufacturing both coke and coal-based manufactured gas. The land on which they were built however, abutted a traditionally elite residential district. Illuminating gas was in use in Pittsburgh by 1837 and presumably was made from coal. It is unclear whether coke from illuminating gas production was used in metals industries at that time.


170. The politics surrounding the passage of pre-1890s ordinances awaits further research. It is clear both from the lack of popular knowledge of some old ordinances and from the interest in passing new ones that such ordinances were largely unenforced. Before 1887 the mayor’s office had no executive departments and any enforcement that might have been done was the responsibility of standing committees of councils, which often failed to achieve a quorum for votes on legislation, let alone to undertake prosecution of individual violators. In 1887 a new charter from the Pennsylvania legislature formed new executive departments under the mayor: the departments of Public Works, Public Safety, and Charity. Department heads were to be appointed by the councils and councils had authority to form new departments as necessary. Before the 1887 reforms, there were no adequate means of enforcing smoke ordinances. Even after the 1892 law was passed, when the enforcement infrastructure was in place, the LHPA would complain about the lack of an explicit enforcement provision in the law. They complained that enforcement was at the discretion of the Director of Public Works and not required of him. Similarly when activists in 1906 found that even an Allegheny ordinance passed as recently as 1897 had remained unenforced, the city clerk’s office was unaware of the ordinance. The paper asked the enforcement question rhetorically over and over in the article and answered as a chorus: “Ask the Department of Public Safety in Allegheny City Hall,” “Smoke Laws That Have Not Been Enforced – Now That They Have Begun Digging the City Officials Find Some That Are Not Half Bad – Fine and Imprisonment,” *Pittsburgh Sun* August 4, 1906.


172. At the point at which they procured the exception, Jones and Laughlin was about to embark on a huge expansion of its operations. They would begin to produce open hearth steel in 1895 and would increase capacity from 650,000 tons in 1898 to more than 1,000,000 tons in 1904. Warren, *Wealth, Waste and Alienation* 193-4.


174. Newspaper quoted in O’Connor and Straub, “Some Engineering Phases of Pittsburgh’s Smoke Problem,” 15. I have not been able to find the original newspaper article.

176. Ferguson represented the 17th ward, east of Lawrenceville. His business – 234 Forty-fourth Street in 1886 – was located within the area covered by the ordinance.


178. 21st Ward


185. At their April 28, 1892 meeting the organization was addressed by the Mayor Elect of Allegheny, the chancellor of Western University and Dr. J. B. Murdock. The LHPA’s annual report delivered at that meeting brought to light the existence of “three ordinances to prevent smoke within the city limits” characterizing all of them as “virtually dead letters.” “Health Protection – Annual Meeting,” Pittsburg Press, April 28, 1892.

186. The Pittsburg Press informed its readership that both Pittsburgh and Allegheny possessed laws “to prevent the roads from doing this, but [they had] never been very vigorously enforced.” “After the Smoky Engines,” Pittsburg Press, April 22, 1892.

187. These new departments took over functions of the councils’ standing committee structure, which had been in place since the city’s founding in 1816. The departments of Public Works, Public Safety and Charity were formed by the act and their heads were appointed by councils. Councils had the authority to form other departments. Joel Tarr claims that the 1887 reforms strengthened capacity for control of the Magee-Flinn machine. Magee and Flinn “pushed through the councils” the appointment of Magee’s cousin, Edward M. Bigelow as Public Works Director. Bigelow, a civil engineer had been appointed as city engineer in 1880 and was acquainted with the city planning ideals and practices of European and American cities. Bigelow served the machine by delivering contracts to Booth and Flinn’s firm. Tarr, “Infrastructure and City-Building,” 233-4.

188. “After the Smoky Engines,” Pittsburg Press, April 22, 1892.


190. In April and May 1892 the organization was also hard at work attempting to compel the city to provide an acceptable refuse disposal plan. The LHPA promoted an incineration plan over the current method of river dumping. Comparisons to other cities were prominent at the meeting. The LHPA report claimed that “Pittsburgh and Allegheny are the only cities not protected by a garbage law.” The group pointed out in a petition they would deliver to mayors of Pittsburgh and Allegheny that New York, Philadelphia, Chicago, Boston, Baltimore all had daily refuse removal plans. They urged that the city adopt the refuse disposal plan similar to that which had been developed for the city of Baltimore. “Health
191. James Joseph Brennan began his career in Pittsburgh in 1876 with the machine design department of the Hartupee Company. By 1880 he had been appointed chief engineer of the Pittsburgh Water Works. He held this position through 1900. While in this position he supervised the building and operation of a new waterworks for the city and designed the filtration plant that would eventually be built in 1908. In 1901 he would become superintendent of power stations for the United Traction Company (not a Magee-Flinn company) and in 1906 would go on to be a mechanical superintendent for Western Pennsylvania in a metals firm. From 1914 to 1920 he would again work as engineer for the Pittsburgh Water Department. “James Joseph Brennan” in Rook, Western Pennsylvanians, 297, 374.)


193. Pittsburgh Pa. Council, Municipal Record: Proceedings of the Select Council, City of Pittsburgh 27 no. 19 (Dec. 10, 1894). The LHPA petition was presented to the Select Council councilman Thomas A. Gillespie, a former general superintendent of the Pittsburgh Gas Company, which had been the largest supplier of natural gas in the world in 1889. From 1890 Gillespie was head of a large and successful engineering and contracting firm with offices both in Pittsburgh and in New York. Gillespie represented Pittsburgh’s 22nd Ward, comprising the Squirrel Hill and Homewood sections of the East End. Support for such an ordinance on the part one with obvious connections to a competing fuel would have been met with suspicion. According to Dale Grinder “… in 1895 the Pittsburgh Leader hinted that the smoke ordinance was nothing but a smoke screen for a gas franchise monopoly.” Grinder cites the Pittsburgh Dispatch May 17, 1895 but attributes the quotation in the text to the Pittsburg Leader. Grinder, “Insurgency to Efficiency,” 189; I have been unable to find the original newspaper article.


195. Mr. Bingham moved for the second and third readings and for passage.


201. W. Dewees Wood appears in the Chamber of Commerce necrology for 1899. H. K Porter was an important Chamber of Commerce activist. Greater Pittsburgh Chamber of Commerce, Fifty Years of the Chamber of Commerce of Pittsburgh, 1874-1924 (Pittsburgh: Press of Murdoch, Kerr and co., inc., 1924). The lawyer was E.S. Scull.


209. Kaufmann’s, a target of nuisance action, needed only to “overhaul” the stokers it had already installed to achieve adequate smoke reduction.


211. Engineers’ Society member and U.S. Pension Agent.


218. I have discussed the significance of this in my article “Class, Gender and Coal Smoke: Gender Ideology and Environmental Injustice in Pittsburgh, 1868-1914,” Environmental History 5 (2000):165-93.


220. The Civic Club had four standing committees: Government, Social Science and Art, directed by men and Education, directed by women. Women did have positions of authority as committee members and officers, but three of the four departments were chaired by men. Nevertheless, the three club members chosen for special honors in the first fifteen years were women. Lobes, “‘Hearts All Aflame,’” 111- 112.

221. The Civic Club, however, dropped the program of expert lectures aimed at women’s self-improvement which had been part of its ancestor organizations’ activities. Lobes, “‘Hearts All Aflame,’” 107. The Civic Club promoted environmental cleanliness as one of many civic concerns. In the late 1890s the Civic Club concentrated on outlawing expectoration and offered the poor playgrounds and public bathhouses. They continued to agitate for pure water and garbage collection. In a 1940 speech on the “Evolution of a Civic Club.” Imogen Oakley, founding member both of the LHPA and the Civic Club still saw women’s interest in municipal reform as an extension of housekeeping: “A Civic Club is an evolution. It is the final development of that divine discontent felt by housekeepers with municipal conditions as they affect the individual home.” Lobes, “‘Hearts All Aflame,’” 107.
222. [Civic Club of Allegheny County], Fifty Years of Civic History, 5.

223. [Civic Club of Allegheny County], Fifteen Years of Civic History (Pittsburgh: Civic Club of Allegheny County, 1910): 5, 33.


227. Carnegie saw complete prohibition of the use of bituminous coal in residential districts as a necessary prerequisite to the creation of “such a public sentiment as will enable officials to compel manufacturers to make not more than a small percentage of smoke, by using every appliance which is found to reduce it.” Pittsburgh Chamber of Commerce, Yearbook and Directory . . . for the Year 1899, 96.

228. Pittsburgh Chamber of Commerce, Yearbook and Directory . . . for the Year 1899, 97.


230. The Chicago area had been the site of major steelmaking since the 1870s. The Tennessee Iron and Coal Company had already decided to build a major steel mill in Birmingham, Alabama in 1898. The first steel would not be shipped until 1900. Warren, The American Steel Industry, 140-4, 184-5.

231. Pittsburgh Chamber of Commerce, Yearbook and Directory . . . for the Year 1899, 98.


237. He said of the 1877 Great Railroad Strike and the Homestead Strike that “a row can be had here if it is really insisted upon” but he blamed the character of these strikes on “outsiders who should not have been brought here and a little too much fiatism.” Metcalf, “Pittsburgh as an Iron Center,” 32-4.


243. “Mr. A. M. Imbrie, Chairman, did everything in its [sic] power toward this much needed reform, and served in divisions under heads as follows: A– Committee on smoke arising from domestic fires and metallurgical manufacturing establishments. B– Committee on smoke from office buildings and all others not included in A. C– Committee on Legislation; of this latter a sub-committee was appointed to meet with the city officials and secure the appointment of a commission.” [Civic Club of Allegheny County], Fifteen Years of Civic History, 33. Civic Club histories credit the group with working tirelessly until it achieved success with the passage of the December 1906 smoke ordinance which they call a “most effective” ordinance. [Civic Club of Allegheny County], Fifty Years of Civic History, 5; [Civic Club of Allegheny County], Fifteen Years of Civic History, 33. This committee delivered its report to the Chamber in the last month of the century. Apparently a great deal of time had passed since the establishment of the commission during the Spanish-American war and the return of the report. The committee had been appointed to “co-operate with similar Committees from the Engineers’ Society of Western Pennsylvania, and of the Civic Club. “ Apparently the other organizations after several months delay appointed committees and held a joint session with the committee from the Chamber of Commerce.” At a second joint meeting “there appeared to be some confusion” by the Engineers’ Society committee about whether they were “authorized to act in conjunction with the Chamber in this good work” by some officials of the Society. Several more months passed waiting for things to clear up so that the Engineers’s Society committee could be authorized to work with the Chamber and the Civic Club. After Captain Hunt returned from Puerto Rico, the Engineers’ Society committee was authorized to work with the Chamber of Commerce with Hunt as president of the joint committee. Greater Pittsburgh Chamber of Commerce, Yearbook and Directory of the Chamber of Commerce for the Year 1900, (Pittsburgh: Greater Pittsburgh Chamber of Commerce, 1900): 59-60.

244. Chamber of Commerce, Yearbook and Directory... 1900, 60.

245. Chamber of Commerce, Yearbook and Directory... 1900, 60-1.

246. Chamber of Commerce, Yearbook and Directory... 1900, 59.


248. Chamber of Commerce, Yearbook and Directory... 1900, 63.

249. Chamber of Commerce, Yearbook and Directory... 1900, 68.

250. Chamber of Commerce, Yearbook and Directory... 1900, 68.


256. “Any Man Can Run This One – All the Judgement Needed Is Enough to Put Coal on the Fires – Smoke Suppressed in Eight Seconds,” Pittsburg Times, May 19, 1900.


The Quay machine, who had long objected to Pittsburgh’s independence under Magee-Flinn, would pass legislation to restructure Pittsburgh’s government and remove the machine mayor and his entire administration from office in March 1901. They would temporarily install a weak local reformer as Pittsburgh’s first “recorder” – the newly mandated office equivalent to mayor. (When this recorder resigned the Pennsylvania governor appointed a Magee-Flinn stalwart to fill the position.) Harper, Pittsburgh of Today, vol. 1, 284-6.

“James Joseph Brennan” in Rook, Western Pennsylvanians, 297; Fleming, History of Pittsburgh, 173.

Pittsburgh Gazette Times, June 25, 1906.

Pittsburgh Gazette Times, June 13, 1906.

Data from weather observer journals of these years cloud the issue of just how much progress was made. The highest number of smoky days before the natural gas period was around 55, while during the natural gas period yearly smoky days did not exceed 20. Between 1885 and 1905 the number of smoky days varied from 0 to 20 before 1894, from 5 to 80 between 1895 and 1900 and from 65 to 90 between 1900 and 1905. Coal consumption in the region was increasing considerably during these years, so such statistics should not immediately cause us to dismiss all positive claims of smoke regulators. Davidson, “Air Pollution in Pittsburgh,” 1035-1041. It would be best to interpret smoky day observations in conjunction with coal consumption statistics, but they are very difficult to use in this connection because they cover different geographical areas.

Progressive critics of the system reported that “summary conviction for violation of city ordinances was to be had before them, and the defendant summarily fined or sentenced to imprisonment.” Kellogg, The Pittsburgh District Civic Frontage, 139-42. Complainants could chose any alderman in the city to whom to take their case. In 1911 Pittsburgh would be “given a county court of concurrent jurisdiction, which has brought about a revolution locally in the handling of minor civil cases.” Yet the alderman’s courts remained even after 1911 in various Pennsylvania towns and cities. Aldermanic courts symbolized the corruption of machine politics to the city’s Progressives. The Survey especially attacked them. Ingham, Making Iron and Steel, 164,174.


278. Brennan claimed that city authorities didn’t even try to take up an effort to get a new law passed Brennan claimed that stokers existed that were almost smokeless as long as firemen operated them carefully. He urged the development of central power stations (for heat and power). Pittsburgh Gazette Times, June 25, 1906.

279. The Thaws had been one of Pittsburgh’s first bankers and then involved in the Pennsylvania Railroad and the coke business. Their coke enterprises had just been bought out by H.C. Frick in 1905 and their most prominent member, Eliza’s brother Benjamin, had begun to devote his time primarily to managing the family fortune. Fleming, History of Pittsburgh, vol. 5, 246.


281. “Large Stores Lose Heavily By the Smoke ... Railroad Violates the Law,” Pittsburgh Gazette Times, June 16, 1906.


287. 23% as opposed to the average proportion of 30% among Pittsburgh furnaces.

288. Bill of Complaint, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, September 9, 1902. (Available at the Prothonotary’s Office, City of Pittsburgh.)

289. Answer of Jones and Laughlin Steel to the Bill of Complaint in the Above Case, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, September 12, 1902. (Available at the Prothonotary’s Office, City of Pittsburgh.)

290. Findings of Fact, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, n. d. 1902 or 1903. (Available at the Prothonotary’s Office, City of Pittsburgh.)

291. Decree, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, January 21, 1903. (Available at the Prothonotary’s Office, City of Pittsburgh.)


293. Justice Brown took the enlargement of the blast furnaces and the brining in of the ore to smelt as artificial uses of the land.


298. Petition, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, January 19, 1907; Answer, Decree, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company (available at the Prothonotary’s Office, City of Pittsburgh), January 19, 1907. (Available at the Prothonotary’s Office, City of Pittsburgh.)

299. Opinion, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, July 12, 1907. (Available at the Prothonotary’s Office, City of Pittsburgh.)

300. Statement of Errors, Petition, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, July 12, 1907. (Available at the Prothonotary’s Office, City of Pittsburgh.)

301. *NLT*, July 18, 1907.

303. Huckenstine’s Appeal.


305. Pro-abatement manufacturer J. Z. Speer said that Jones and Laughlin had spent a lot and gotten a lot of improvement in boiler smoke abatement. “To Perfect Smoke Bill,” Pittsburgh Post, November 14, 1906.


307. This account of Pittsburgh progressivism relies on Ingham, Making Iron and Steel, 167-70. The quotation from Roy Lubove is also used by Ingham.

308. Ingham, Making Iron and Steel, 167-70. Other groups important in Pittsburgh Progressivism, many of which included high proportions of Calvary members, included the Civic Club, the Voters’ League, the Pittsburgh Chamber of Commerce, and the Pittsburgh Board of Trade. By John Ingham’s analysis: “Of the forty families [belonging to the Civic Club] twenty-one were Core upper-class and another eight Non-Core upper class families, generally the oldest and most distinguished in the city.”


311. Ingham, Making Iron and Steel, 167-70.

312. Ingham, Making Iron and Steel, 167-70.


315. “Black Clouds of Smoke Make Atmosphere Dense – Complaints From All Quarters Accompanied With Hope for Speedy Relief Through Action of the City Council and Health Department – Ordinance Will Soon Be in Complete Form,” Pittsburgh Sun, July 14, 1906.

316. The Pittsburgh Sun (PS) alone published more than 55 articles on smoke between June and October 1906. Other papers, the Pittsburgh Gazette-Times (PGT), Pittsburgh Daily Dispatch (PDD) and the Pittsburgh Post (PP) together published more than 20 articles on smoke between June and November 1906. Titles include: “Mayor Guthrie Wants to Stop the Smoke Nuisance,” PGT, June 16, 1906; “Large Stores Lose Heavily By Smoke ... Air Must Be Washed” PGT, June 16, 1906; “Cleveland’s Handling of Smoke Evil,” PS, July 6, 1906; “Declares Smoke Is Unsanitary” PGT, July 8, 1906; “Clothing Is Ruined By Smoke of Sand Digger,” PS, July 10, 1906; “Big Mills to Put In Consumers,” PS, July 12, 1906; “Gas


319. Parton, “Pittsburg.”


322. “Red Ore Dust Covers Oakland As Much As Ever.”


325. “Abatement to be Offered Monday,” Pittsburgh Sun, July 23, 1906.


327. “Smoke Resolution Will Be Introduced This Evening – Councilman C. D. Tilbury Will Call Upon City Attorney Rodgers to Draw Up an Ordinance – Real Soot Octopus Has Been Discovered -- Pennsylvania Avenue Roundhouse of the Ft. Wayne Railroad in Allegheny Belches Forth Soot All the Time,” Pittsburgh Sun, June 25, 1906.

329. “Big Mills To Put In Smoke Consumers – Success of Crusade of “Sun” for Cleanliness in Health Becomes More Evident Because of Interest of Manufacturers – Allegheny Folk Petition the Mayor,” Pittsburgh Sun, July 12, 1906.

330. Tilbury was manager, according to Carmen Peter DiCiccio’s council member biography, of an “unknown firm” at 801 Liberty Avenue. DiCiccio, Social Biographies of the Select and Common Council, 93. In 1916 the Liberty Hotel occupied this address. Fleming, Pittsburgh, How to See It, 89. In 1903 G. A. Samuels owned this property. Griffith Morgan Hopkins, Real-Estate Plat Book of the City of Pittsburgh, Supplement to vol. 3 (Philadelphia: G.M. Hopkins, 1903). Samuels was a wholesale butter and cheese dealer. Chamber of Commerce, Yearbook and Directory (1903): 168. It seems likely that whatever business Tilbury was in, it was not industrial and was perhaps related to a trade whose goods or business might be damaged by smoke.

331. “Abatement to be Offered Monday,” Pittsburgh Sun, July 23, 1906.

332. “Smoke Ordinance Ordered Drawn Up – Select Councilman C. D. Tilbury's Resolution Was Passed At the Meeting Last Night – The City Solicitor Called Upon to Act – No Objections Raised and Special Meetings of Councils May Hurry the Reform Along this Summer,” Pittsburgh Sun, June 26, 1906.


339. “East End Up In Arms – The Board of Trade Appoints a Committee to Investigate the Smoke Nuisance in That District,” Pittsburgh Sun, June 22, 1906; “Joins Crusade Against Smoke Evil – Chamber of Commerce Plans to Take Active Part in Effort to Make Pittsburgh a Cleaner City,” Pittsburgh Sun, June 23, 1906; “Smoke Law Demanded By All Classes – Concerted Effort Will Be Made to Secure Proper Action by the City Councils Next Month – A Letter to C. D. Tilbury,” Pittsburgh Sun, August 21, 1906.


“Big Mills To Put In Smoke Consumers,” *Pittsburgh Sun*, July 12, 1906.

“Dense Smoke To Stop With New Law – Councilman Tilbury Completes the Ordinance Which Has Been Designed From Those of Other Cities Where They Have Brought Good Results – Is Passed Upon By Prominent Attorneys,” *Pittsburgh Sun*, July 18, 1906.

“Glad You're After the Horrid Smoke Pests – That's What Comes In the Mail That is Delivered to Councilman Tilbury for Fathering New Ordinance – The People All Like It – The Law Will Be Presented to a Council of Attorneys This Afternoon to Be Sure There Are No Loopholes,” *Pittsburgh Sun*, July 20, 1906.


“The Smoke Ordinance Not Strong,” *Pittsburgh Sun*, July 5, 1906

“Red Ore Dust Covers Oakland as Much as Ever,” *Pittsburgh Sun*, July 3, 1906.

“Consumers are Being Installed,” *Pittsburgh Sun*, July 9, 1906.

The *Sun* and smoke abatement officials generally blamed manufacturers and locomotives, followed by office building boilers and mobile steam engines for smoke. “Gas Supplants Soft Coal And Also Black Smoke – Joseph Horne Company Throws Out All Other Fuel for Gas and Finds That the Result Is Cheaper and Cleaner Operation in Every Way – Thinks Others Should Do The Same Thing,” *Pittsburgh Sun*, July 13, 1906.


Under that ordinance they had appeared to “operate differently on different plants” so proved discriminatory. “Many experts had testified” in opposite ways about them in the Keech trial, which had struck down the old ordinance. “How The New Smoke Ordinance Will Work – Some of the Provisions Which Will Be Incorporated In Law Which Will Be Presented to the City Councils for Passage – Will Be One Which Can Be Enforced – Will Not Attempt Unreasonable or Impossible Things, but Will Effectually Stop the Nuisances which Have So Long Been Permitted,” *Pittsburgh Sun*, July 19, 1906; “Health and Sanitation Committee Makes A Quorum on Third Call and Passes the Tilbury Bill Unanimously -- Now Up To Councils,” *Pittsburgh Sun*, Sept. 29, 1906. In addition, “during the Keech Case many experts swore that the percentage of smoke couldn’t be practically determined.’”“Minds the Breakers of the Old Law – That's
the Beauty of the New Ordinance That It Includes All Objectionable Stacks and Chimneys -- Thought To Be a Model – Framed from Others That Have Stood the Test of Time and Severest Attacks of Courts Elsewhere,” Pittsburgh Sun, July 26, 1906.


357. Enforcement was left to discretion of the inspector. “Health and Sanitation Committee Makes A Quorum on third Call,” Pittsburgh Sun, Sept. 29, 1906. The ordinance appointed 1 smoke inspector with 3 deputies and a stenographer who would inspect and supervise the construction and alteration of all furnaces and boilers, both stationary and mobile and also supervise firing when necessary. The provision required inspection and report writing on all steam generating plants and gave inspectors the authority to write up complaints, assess causes and require changes, as well as to prosecute offenders. Inspectors were to be helped by the city police. “This Law To Suppress The Black Smoke – It Was Presented to the Select Council Last Night and Is Now in the Hands of the Finance Committee -- Businesslike Document -- goes After the situation in a Way That Is Eminently Fair and Still Calculated to Get Results,” Pittsburgh Sun, July 24, 1906.


359. “An Example of Good Stoking – The Stack at Union Station Is an Example of How the Smoke Nuisance May Be Abated,” Pittsburgh Sun, August 1, 1906.


364. “Gas Supplants Soft Coal And Also Black Smoke,” Pittsburgh Sun, July 13, 1906.


“Elevated Engines are Smoky,” *Pittsburgh Sun*, July 31, 1906.


“Many Evils Are Corrected By Director – Clark Announces That Railroads Have Adopted Plans to Abate Smoke Nuisance Within City Limits,” *Pittsburgh Sun*, Sept. 8, 1906; “Last Touches Being Given Smoke Law – William McConway Suggests an Important Amendment to the Tilbury anti-Smoke Ordinance – Measure In Good Shape,” *Pittsburgh Sun*, August 21, 1906.


An Allegheny court case from the 1860s set a precedent that made it difficult to enforce restrictive railroad charters. A suit against the Cleveland and Pittsburgh Railroad Company for smoke nuisance in Allegheny was reviewed by the Pennsylvania Supreme Court in 1867 and 1868. In 1866 James A. Speer, a painter living at the corner of Walnut and Preble streets in Allegheny, brought an action against the Cleveland and Pittsburg Railroad Company based on a borough of Manchester ordinance from October 27, 1856. The ordinance limited the speed of the trains to four miles and hour when passing through the borough, restricted the kind of fuel that could be used and required the railroad to refrain from obstructing the street with its rolling stock. The plaintiff complained that his house on Preble street (crossing Walnut Street in Manchester) was damaged by noise and smoke from the railroad, beginning around 1858, when the railroad had erected switches across from his home. A jury in the Court of Common Pleas in Allegheny Count in 1867 awarded damages to the Speers of $1362.50, subject to the court’s ruling on the question of whether the company had a right under the charters previously issued by the states of Ohio and Pennsylvania as well as under the Manchester Borough charter to enter the city. The Court of Common Pleas decreed that it had no such right (the Supreme Court justice asserted that the lower court gave no reasons for this) and so the damage award stood. The railroad appealed to the Pennsylvania Supreme Court. Supreme Court Justice Agnew, on January 7, 1868, who had also been the justice in Huckenstine’s Appeal overturned the lower court’s verdict, ruling that the charters given to the railroad from the states had a status almost of a treaty and gave the railroads the right to use the land they were authorized to go though in the way they chose. It granted them even the right to destroy houses, it in fact, destroyed the neighborhood. The area around Preble and Walnut was not a location of elite residence, though it was within twelve or so blocks of the elite Ridge Avenue neighborhood of Allegheny. By 1872 Speer had sold his property and several of the adjacent properties were in the hands of heirs of their previous owners. (I am not certain that the transfer to heirs happened after the switches went in at Preble and Walnut.) By 1895 there were no Blue Book entries on Preble street at all.


379. “Councilmen Oppose Smoke Ordinance – Member of Common Branch Against Tilbury Measure Because It Will Force His Employer to Buy Machinery,” Pittsburgh Sun, Sept. 13, 1906.


382. “The Tilbury Smoke Bill Must Pass --The People of Pittsburgh Refuse to Be Governed by the Biased Personal Attitudes of Cunning Councilmen -- It Means Higher Wages,” Pittsburgh Sun, Oct. 11, 1906. An address of Toledo’s mayor to its city council accused “manufacturers” who “thoughtlessly poison the atmosphere with smoke, defile our cities and cause such great damage to others” – all the while losing “from 15 to 25 per cent of their fuel.” The mayor’s address painted merchants as innocent victims of manufacturers: “smoke destroys thousands of dollars worth or merchandise annually, dry goods. merchants. clothiers. dressmakers, tailors, milliners, outfitters booksellers, grocers and druggists suffer enormously and jewelers find it impossible to protect their plate from the corroding gases that impregnate the air.” “Will Prepare Law To Stop The Smoke,” Pittsburgh Sun, July 10, 1906. He complained of the effects of elevated railroads downtown on local merchants and the smoke that “ruin[ed] hundreds of dollars of light colored and fine grades of goods” which had to be “kept throughly covered when not absolutely necessary for sale.” “Elevated Engines are Smoky,” Pittsburgh Sun, July 31, 1906.


386. Grinder, “From Insurgency to Efficiency,” 194.


390. “May March on City Council” Pittsburgh Post October 27, 1906.

391. “May Demand Smoke Bill” Pittsburgh Post October 29, 1906.

392. “May Demand Smoke Bill.”

Grinder, “From Insurgency to Efficiency,” 194.


“Smoke Ruining Art Treasures Worth Fortune.”

“Smoke Ruining Art Treasures Worth Fortune.”

“Smoke Ruining Art Treasures Worth Fortune.”

“Smoke Ruining Art Treasures Worth Fortune.”

“Smoke Ruining Art Treasures Worth Fortune.”

“Smoke Ruining Art Treasures Worth Fortune.”

Grinder, “From Insurgency to Efficiency,” 197-8.

“Smoke Ruining Art Treasures Worth Fortune.” as was reported by angry council member P. F. Toole.


“Smoke Ruining Art Treasures Worth Fortune.”

“Fight Over Smoke Bill Looked For,” Pittsburgh Daily Dispatch, November 9, 1906.


As quoted in Grinder, “From Insurgency to Efficiency,” 196.

“Shows It Pays to Stop Smoke,” Pittsburgh Post, November 10, 1906.

According to Dale Grinder Pittsburgh’s ordinance was to that pushed through the Missouri legislature by the St. Louis Manufactures Association in 1901. Grinder, “From Insurgency to Efficiency,” 198.


419. “No Breeze to Lift Pall of Smoke From the City,” Pittsburgh Daily Dispatch, November 15, 1906.

420. [Cushing et al.], History of Allegheny County, 132; Social Directory 1904, 212; Some Engineering Phases of the Pittsburgh Smoke Problem 17-8.


422. His administration was regarded as “discerning and effective” by the biographer writing in The Book of Prominent Pennsylvanians: A Standard Reference (Pittsburgh: Leader Publishing Company, 1913): 98.

423. The Book of Prominent Pennsylvanians, 98.

424. The Book of Prominent Pennsylvanians, 98.


440. According to a 1951 history of Pittsburgh’s public health laws, “Within ten weeks of the decision in that case, the statute set out in this section had been passed by the General Assembly and Approved by the Governor.” Kuhn and Stahl, Public Health Laws, 303-4.


443. In January 1912, Searle was even more determined to undertake prosecution: “The conduct of the Division heretofore had been almost entirely educative and not litigious .... A firm position must be taken now and prosecutions will be entered were absolutely necessary.” Pittsburgh Dept. of Public Health, Annual Report 1911, 308.


446. Early, “The Pittsburgh Survey.”


457. He wanted to “consult with local experts” “notables.” The Pittsburgh Survey “team viewed the social worker as facilitating and directing community leaders in reaching a consensus on reforms ... [which] needed local initiative and sponsorship because local notables were one of the target audiences for the survey’s results.” Turner, “The Pittsburgh Survey and the Survey Movement,” 35-39.


470. Bauman and Spratt assert “The PCC represented the first consequence of the Survey for the City” and “reflected a growing national interest in city planning evident in such places as St. Louis, San Francisco and Seattle where business oriented civic commissions orchestrated major park projects and other city planning ventures...” ”Bauman and Spratt,”The Pittsburgh Survey and Urban Planning,”159.

471. According to Trisha Early, “Guthrie’s immediate partial solution to the problem of the exclusion of the commercial organizations form the legislative process was the creation of the Civic Improvement Commission. Early, “The Pittsburgh Survey” 33.


CHAPTER 4

SMOKE, INDUSTRIAL RESEARCH, AND VISIONS FOR PITTSBURGH, 1911-1922

In 1912, as the city was reeling from the attacks of the Pittsburgh Survey, Life magazine spent an entire issue lambasting the city. Its cover featured a background of smoky factory chimneys, millionaires with money bags, beautiful women blowing smoke into their faces, and seedy characters slinking into the smoke to make a fast buck. At the center was a powerful looking workman, impervious to smoke and in the foreground a short female figure in a skirted business suit with a determined look on her face and a chimney brush in her hand. This “Pittsburgh Number” of Life featured five other political cartoons with recurring themes: elites leaving the town’s cover of smoke with their Pittsburgh-made wealth, headed for New York; smokiness seen from outer space or the air making it difficult to distinguish Pittsburgh from an active volcano; the thorough baths necessary for travelers returning from the city; and the ways in which one would expect husbands and wives to cling together there, given the threatening nature of the external environment. Some jokes were repeated several times in the issue.

The first joke concerned the observed trend, instantiated by one infamous case, of Pittsburgh millionaires running off to New York in order to marry chorus girls. Harry Kendall Thaw, brother of Eliza Thaw Edwards who had brought action for nuisance
against the Junction Railroad in 1903, and brother-in-law of Civic Club activist Mrs. William Thaw Jr, had murdered for his chorus girl wife. Thaw had pursued and, in 1905, married Evelyn Nesbit, a young woman from Tarentum, Pennsylvania, whose beauty and vocal talent had allowed her to become a sculptors’ and photographers’ model, as well as a chorus girl, in New York, by her late teens. At sixteen she had been seduced by architect Stanford White, known for his sexual debauchery. Thaw, after persuading Nesbit to marry him, became distressed over her affair with White and on June 25, 1906 shot and killed him at a theatrical performance at Madison Square Garden. The subsequent trial created a sensation in New York and in Pittsburgh, though Thaw would escape heavy punishment. Lisa Cardyn in American National Biography characterizes Thaw as having been raised in the style of the “Gilded Age nouveau riche” and as trying to buy his way into New York Society. Yet, the Thaws, bankers and transportation magnates in Pittsburgh from the city’s earliest years, were well-established members of Pittsburgh’s upper class. Pittsburgh Society was, to some degree, still marginal in relation to national elite culture in the first decade of the twentieth century. Life poked fun at nationally marginal Pittsburghers’ newfound cultural pretensions: Pittsburghers’ wealth, hence their ability to join the cultured class, was based on a substance called “pig.”

Life perpetuated clichés about Pittsburgh as it acknowledged their cliché status. It repeatedly mentioned, while claiming it would not, Pittsburgh’s abundance of millionaires, its poverty and low moral standards, its new found cultural and artistic aspirations, and its pervasive smoke. The magazine’s millionaire and chorus girl caricature contrasted with earlier images of the city. It was very different from the picture
painted by James Parton in 1868 of hardworking local employers whose love of industry and of smoke kept them from the vices of conspicuous consumption. Other themes reinforced the older civic image. Parton had seen smoke as successfully enforcing class equality. Life found it difficult to believe that Pittsburghers could live a genuinely cultured life – attain a cultural status suitable for their economic class – given the sources of their wealth and the living conditions produced by the processes that created it.

Life emphasized some of the themes highlighted in the Pittsburgh Survey. The one serious poem in the issue, “The Blast Furnaces,” spoke of the hunger of the blast furnaces for fuel and for human lives to consume and laid the blame on the human beings who created the monstrosous furnaces. A parody of “Sing a Song of Sixpence,” mentioned Pittsburgh’s “rags and dirt and squalor” and “gems and gowns by Worth” along with rising immigration, but tied both to rags to riches possibilities. In a parody to “My Bonnie Lies Over the Ocean,” the Browns, a prosperous Pittsburgh family, were said to be great attenders and creed reciters at church. They were also great givers to missions “that strive to convert the poor nig.” Their nature of their religious zeal was explained with the phrase “[they] got their religion from ‘pig’.” The implication of the poem was that church attendance and contributions to distant missions were a poor substitute for attention to hungry and thirsty neighbors at one’s door or in one’s ironworks.

Life’s jokes and cartoons surely stung Pittsburghers, especially those whose family backgrounds would allow them to be tarred with the same brush as Harry Thaw. Worries expressed in Carnegie’s 1898 address to the Chamber of Commerce, about Pittsburgh “losing her [industrial] grip,” alongside the indictments of civic organization published by Pittsburgh Survey investigators, became important foci of elite anxieties.
These specific concerns would influence efforts to shape the city’s character and development for decades to come. Smoke control would become the fulcrum on which efforts to address the whole complex of cultural, social and economic anxieties rested.

This chapter will examine the use of smoke by Pittsburgh elites, particularly the Mellon family, to address the national embarrassment that the city’s environmental and social degradation had become. This effort was embodied largely in various efforts at reform research – Pittsburghers re-doing the surveying of their city on their own terms. Smoke was important in several of these efforts but was the major subject in what would come to be called the Mellon Institute Smoke Investigation. This chapter both examines the values embodied in the efforts at counter-surveying, particularly MISI – and tries to place them in the context of Pittsburgh’s changing culture. Late in the chapter, I will examine MISI’s efforts to found and direct a movement for smoke control in Pittsburgh. In particular, I will discuss conflict over smoke inspector qualifications and methods, and over whether significant smoke abatement progress had already been made in Pittsburgh. Finally, I will address questions raised by other historians of smoke abatement about the changing engineering or environmentalist character of the smoke abatement movement.

4.1 Counter-Surveys

By the early teens, the Survey had set off multiple attempts at counter-surveying in Pittsburgh. In late 1911 the Pittsburgh City Council (newly reorganized into a single chamber by the city charter of 1911) passed an ordinance authorizing the mayor to hire one or more investigators to examine “the economic and other conditions of the city affecting its industrial and commercial prosperity” and to return “such recommendations
as shall be deemed advisable for advancing the industrial and commercial growth of the
city.'5 The mayor chose University of Pittsburgh economics and finance professor John
Thomas Holdsworth to undertake the Economic Survey of Pittsburgh. Holdsworth and
recent University of Pittsburgh graduate (1910) John Joseph O’Connor Jr. spent three
months gathering information on matters such as the cost of food, freight rates, municipal
tax structure, the availability of workers’ housing and the severity of the smoke problem.
Holdsworth, in his final report bridled at the breadth of the request and the paucity of
both money and time to carry it out, comparing their enterprise with the “narrower” but
better staffed and funded social surveys in other cities: the Merriam Commission in
Chicago, the Polish Survey in Buffalo and the New York Commission on Congestion of
Population.6

The Economic Survey began with a list of Pittsburgh’s needs in order of priority,
with “the elimination of the smoke nuisance” at its head. It called smoke “eradication”
the “first fundamental need of Pittsburgh.” Housing construction, conveniently providing
further commercial opportunities in real estate, came in second. The Economic Survey
recommended investments in real estate and truck farming, rather than unionization,
factory inspection or abolition of the twelve hour day, as the solutions to Pittsburgh’s
social ills. It promoted working class gardening and new business ventures in local food
production, rather than wage increases, as solutions to the problem of a cost of living that
outpaced workers’ income. It acknowledged that comparatively high wage rates for local
workers should be evaluated only in the context of the seasonal and periodic
unemployment that significantly reduced yearly income. Yet, it claimed that
unemployment varied with “season and industry rather than with locality” without
considering that Pittsburgh’s extreme dependence on a few heavy industries made it especially vulnerable to such periodic unemployment. The survey recommended better employment agencies rather than any change in the practices of employers or in the city’s economy as a remedy to this problem.

Attention to smoke allowed elites to divert attention from pressing problems of industrial exploitation. The Economic Survey proceeded under the assumption, which underwrote the smoke abatement movement in many manifestations, that those reforms that were worth undertaking were those that in reality either exacted no cost or provided further money-making opportunities for business. The City Council, in commissioning the Economic Survey offered an alternative to the Pittsburgh Survey emphasizing economic or commercial instead of social factors. As John F. Bauman and Margaret Spratt have noted, local elites had embraced the conclusions of the Pittsburgh Survey that supported environmental reform, but bristled at its stinging indictments of high rates of mill accidents and low wages.

The Economic Survey was serialized in several of Pittsburgh’s newspapers in the spring of 1912. Like the Pittsburgh Survey, it was research with the goal of education leading to action. At least one means of taking such action had already been established by the Chamber of Commerce. The Economic Survey had been undertaken with the backing of the Pittsburgh Industrial Development Commission, a new arm of the chamber. Organized for a three-year term in October 1911, the commission sought to “promote the progress and preserve the prosperity of Pittsburgh” by “securing more diversified industries” and by promoting the products of existing ones. The commission sought to publicize Pittsburgh’s advantages “in order to retain and further develop its
preeminence as the ‘Workshop of the World’” as well as to encourage the establishment of “new concerns in the valleys of the three rivers and near to the railroads that ran in all directions to and from the ‘Gateway to the West.’” The commission’s Publicity, Real Estate, Home Trade Development, and Commercial Clearing House departments developed specific plans of action. Even for the commission, however, the form of the survey was the place to begin. They had pushed for the establishment of the Economic Survey to give a local view of Pittsburgh’s problems, but they also engaged in their own research. For instance, the commission sought to gather and disseminate data on products manufactured in the district, so that Pittsburgh firms could buy producers’ goods locally.9 Reform research, as embodied in the Pittsburgh Survey, had raised many questions, and reform research, of a different sort, was expected to provide the answers.

4.2 The Mellons, Industrial Research, Reform Research and Smoke

Another local survey, but one that also aspired to contribute to universal scientific knowledge, was the Mellon Institute Smoke Investigation(MISI). This study was founded as an early adjunct of industrial research efforts at the University of Pittsburgh, funded by Andrew and Richard B. Mellon. In order to understand the place of MISI in Pittsburgh’s history, it is essential to know something of the family that established and sustained both the project and its institutional home.

Thomas Mellon was the founding patriarch of the Mellon family of Pittsburgh. His family emigrated in 1818 from the Ulster Plantation when Thomas was five years old. They established a farm in Greensburg, Pennsylvania, but the post-war depression of 1819 hit the region and the Mellons forcefully. The family was forced to sell off their
farm produce at very low prices. Thomas Mellon, looking back, blamed the depression on “the canker worm of credit.” As a teenager, he idolized Benjamin Franklin.\textsuperscript{10} Mellon held to traditional Scotch-Irish Presbyterian values. A recent social history of the Scotch-Irish in America uses a profile of Thomas Mellon as the centerpiece of its introduction.\textsuperscript{11} In the section of his autobiography entitled “Aversion to Labor” Thomas Mellon quoted a poetic parody circulated in newspapers at the United States centennial. The original piece of verse was from \textit{Poor Richard’s Almanac}:


Farmer at the plough,
Wife milking the cow,
Daughter spinning yarn,
Son threshing in the barn,
All happy to a charm.

And the parody, which Mellon calls “the modern improvement – 1876”

Farmer gone to see a show,
Daughter at the piano,
Madam gaily dressed in satin,
All the boys learning Latin,
With a mortgage on the farm.\textsuperscript{12}

Mellon biographer Burton Hersh begins the first section of his book about the family with a quotation from Thomas Mellon as epigram: “The normal condition of man is hard work, self-denial, acquisition and accumulation; and as soon as his descendants are freed from the necessity of such exertion they begin to degenerate sooner or later in both body and mind.”\textsuperscript{13}

Thomas Mellon pursued acquisition and accumulation. He became a lawyer, invested in coal and railroads and eventually profited from the rebuilding boom following Pittsburgh’s 1845 Great Fire. In 1859 Thomas Mellon was elected judge in Pittsburgh, and in 1870, after stepping down from the bench, he and his sons founded the Mellon
Of his eight children, sons Andrew W. and Richard B. would be most important in the family businesses and in the history of the region and nation. The Mellons would become founding investors in H. C. Frick’s coking enterprises, and in Gulf Oil and Alcoa Aluminum, as well as in the local steel industry. As bankers invested in many industries, rather than as industrialists wedded to particular technologies or materials, their capital was fluid. Their allegiances to particular industries, much less production processes or fuels were generally weak. Gerald W. Thompson, in his contribution to Stephan Lorant’s history of Pittsburgh, wrote of Andrew Mellon: “The wizardry of Mellon was the facility with which he shifted his claims on production from fading to flowering industries. In his early years he bought shares in coke ovens, later shifting from coke to iron, from iron to steel, from steel to oil, from oil to aluminum. Always coming in just before the industry reach its full flower. As a man of money, rather than a man of property, he accumulated a much greater fortune, but far less notoriety than his only serious rival... J. Pierpont Morgan....”

Endowing the Industrial Research Department of the University of Pittsburgh, which would develop into Mellon Institute, would provide the Mellon brothers with a reliable way to stay ahead of new trends in science and technology. It would allow them to better choose new investments and manage those they already owned. It also allowed them to respond to local pressure for philanthropy, generated by Andrew Carnegie’s example, in a way that would not force them to compromise values their father had inculcated in them. From the days of the austere judge, the Mellon family had been selective about its philanthropies. Thomas Mellon felt a great reluctance to give to the unworthy poor, or to ineptly managed institutions. He was reluctant to bring any attention
to himself or to the family through philanthropy and disapproved of Andrew Carnegie’s philanthropic flamboyance. In the first decades of the new century the Mellon family found itself under pressure to make philanthropic contributions to local Pittsburgh institutions, notably the financially troubled University of Pittsburgh and the local Presbyterian Church. They resisted these pressures into the 1920s, when they finally fully succumbed. Philanthropic endowment of the Mellon Institute and of its Smoke Investigation suited the family’s identity, ideals and predicament in a number of ways.

These endowments were connected, in multiple ways, with Andrew Mellon’s personal concerns. In Spring of 1909 Andrew Mellon’s wife, Guinness stout heiress Nora McMullen demanded a divorce. Her distaste for Pittsburgh was prominent in the divorce proceedings, though after the divorce she stayed in Pittsburgh, near her children, in spite of her earlier protestations. She had found the transition to life in Pittsburgh, and her separation from the English countryside, very difficult. According to Burton Hersh, Mellon biographer, when “the two climbed off a Pennsylvania car at the familiar [to Andrew] East Liberty commuter station...Nora was badly startled. ‘We don’t get off here, do we?’ she reportedly asked. ‘You don’t live here?’” Paul Mellon, her son, later recalled, “The house was late Victorian and very dark – the halls were dark, the walls were dark, and outside, Pittsburgh itself was very dark...” Pittsburgh soot apparently was “so pervasive it blackened her underwear drawer.” She complained of disagreements with Andrew Mellon over whether their children should be “trained into the Pittsburgh atmosphere, become drenched in it” or “rise above...the Pittsburgh clouds and let sunlight in when they came of age.” While Nora felt herself physically able to bear Pittsburgh, she feared for the health of her children, whom she wanted to remove from the “gray-smoke
and dust-filled air of...[her] husband’s gold and grim estate.” Nora argued that she was “sick at heart to live in the middle of so much I was told to despise” in “the gray world of cold steel.”

In the aftermath of messy divorce proceedings, which included accusations of adultery against Nora, Andrew Mellon was devastated. He seemed to lack his former enthusiasm for his business affairs and did sell off some of his interests. According to Hersh, he even investigated possibilities for selling Gulf Oil. Friends, relatives and business associates presented him with diversions. Mellon took up French, so that he could travel more comfortably in Europe, as one such diversion. His French tutor passed on to him an idea for a chemical innovation originated by the tutor’s own father. Mellon sent it on to the general manager of Gulf Oil. The manager judged that the idea was worthless, but he sent along a book that suggested how a businessman might separate the scientific and technological wheat from the chaff: Robert Kennedy Duncan’s industrial research manifesto, *The Chemistry of Commerce* (1907). Duncan had written:

> It is no mistake to say that American manufacture is a chaos of confusion and waste...The confusion and waste, it should be said, are chemical, not mechanical...Since every manufacturer deals with the modification of substance and substance is the business of chemistry, every manufacturer is just exactly to that extent chemical. That this fundamental truth has not in the past been recognized is due largely to the fact that manufacturers of the last generation were, generally speaking, men endowed with great natural abilities but of small education...men who, starting as factory hands, worked themselves up through the grades of foreman and superintendent to managements and presidents. To such men, science and all scientific methods meant literally nothing. It was outside their ken and they had all the impatience and disdain of the practical man for what they called the theoretical fellow....

Andrew Mellon was taken with the system of “industrial fellowships” the book proposed and called Duncan to Pittsburgh. In 1910 University of Pittsburgh Chancellor Samuel
Black McCormick, seeing a long-desired opportunity to finally capture Mellon money for the university, offered Duncan the chance to establish an industrial research center. The Mellons financed a modest laboratory in a temporary building at which Duncan was to prove himself. He would be “dean” of a new university department, projected to become a school comprising three departments: chemistry, industrial research and chemical engineering – this at a time when the University of Pittsburgh was just beginning to establish graduate programs.\(^{22}\) The new department, like the institute Duncan had established on a smaller scale at the University of Kansas, would provide facilities and a staff of scientists who would be available to solve industrial problems on a for-hire basis. Businesses would fund “fellowships” to support research on the problems they set.\(^{23}\) According to William Larimer Mellon “From its inception this whole scheme represented to A. W. a plan for an engine to serve as a prime mover for industrial progress.”\(^{24}\) As we have seen, personal and psychological motives, together with intellectual and business interests, led the Mellon brothers to see industrial research as their path forward.

Before Mellon Institute only two significant industrial research laboratories existed in the United States, one funded by General Electric and one funded by DuPont. Mellon Institute’s approach, offering researchers and facilities for hire to interested industries was unique. A review of industrial research in the United States published in 1917 for the British government gave Mellon Institute its own chapter. Other chapters carried general headings like “National Institutions” “Universities and Colleges” and “Examples of Industrial Research Laboratories of Manufacturing Corporations.”\(^{25}\) In March 1911, Duncan began to administer the fellowship system in his new home. During 1911 and 1912 the Pittsburgh department was home to industrial fellowships for studies
of bakers’ bread, gasoline, cement, coated steel, citrus fruit, flooring, glue, soap and oil for the Armour meat company, and of “food” for the Beechnut Food Packaging Company.²⁶

A.W. Mellon later reflected on the value of industrial research:

I was very interested in these ideas of Dr. Duncan’s for as a result of all my reading and observation it seemed to me that improvement in the standard of living of the human race could come about in the future only by reason of new discoveries and inventions, just as, in the past, the steam engine had been responsible for many improvements in the standard of living enjoyed by the average man today. It was these things and not governmental or political action that have increased production, lowered costs, raised wages, elevated the standard of living and so have brought about a greater participation of the human race in these benefits.²⁷

It is not clear that Thomas Mellon would have approved of raising the material standard of living for the masses as a worthy goal, any more than he would have approved of his son learning French for the purposes of European travel. The Mellon brothers, pleased with Duncan’s progress, would, in 1913 build him a well-equipped new building. They dedicated this “Mellon Institute of Industrial Research” as a memorial to their recently deceased father.²⁸

4.3 Mellon Industrial Research: Gold From Lead?

The endowment of Mellon Institute also meshed well with another of Andrew Mellon’s post-Nora diversions, new investments in by-product coking. The Institute’s mission coincided well with the Mellons’ relatively new interest in the chemicals industry. By-product coking and coal tar chemicals (such as the various ammonium compounds as well as benzene, toluene, naphtha and xylene) had the potential to bring Pittsburgh industries into a new relationship with abundant local coal. This new relationship was
more than compatible with smoke abatement since by-product coking depended on recovery of unburned wastes formerly discharged in smoke. Coke-making was a large industry: in 1911, coke was required for smelting 98% of the pig iron in the United States. Smoke emitting and by-product-wasting beehive ovens were the chief source of coke from the 1850 to 1920. The Connellsville Coke Region in southwestern Pennsylvania pioneered construction of beehive ovens and produced most of the coke for Pittsburgh and for the entire country. The Mellons provided H.C. Frick with important financial backing for the development of this industry. As we have seen in previous chapters, beehive ovens had been officially illegal in Pittsburgh until 1892 when councils had allowed construction of beehive ovens within city limits (contra the much-violated 1864 ordinance) so long as they were constructed according to approved designs. Hazelwood’s Jones and Laughlin coking plant, constructed between 1899 and 1907, included 1,510 beehive ovens and was a major source of pollution in Pittsburgh. By-product ovens would not only reduce smoke from such a source but would provide energy for industrial power needs that would not then have to come from burning more bituminous.

In 1909, a young Pittsburgh boiler designer, Henry Bedinger Rust approached Andrew Mellon with a proposal to fund the German Koppers company in setting up new and particularly efficient by-product coking facilities in the United States. A facility they had already established in Joliet, IL was, on the plan proposed, to be transferred to Pittsburgh. Around this time United States Steel had found that use of coke oven gas for power generation could significantly improve fuel efficiency in integrated steel mills. Within a few years the supply of organic chemicals from Germany would be cut off by
the war, creating a market for coal-tar products collected as gas was captured for use as fuel. The coke-oven company grew very quickly. Mellon would initially hold 37.5% of the shares of Koppers-Pittsburgh, which was established in November 1915. The Mellons funded research at Mellon Institute on the processing of by-products collected into fuel oil products, weapons components and eventually dyes, pharmaceuticals, illuminating gas, preservatives and pesticides. After the United States entered the Great War in April 1917, and congress voted to allow the confiscation of property of “enemy aliens”, the Koppers board of directors voted to sell off the original German proprietor, Heinrich Koppers’ 20% share in the company. The new American market for by-products spurred the building of many other new by-product plants. Carnegie Steel’s Clairton coke plant would become the world’s largest coking plant in 1916. By 1929 by-product coking supplied 75% of the coke manufactured in the United States. As Joel Tarr has argued, while by-product coking improved rural air by cutting down on coking in the Connellsville district, it degraded the quality of urban water by flushing unusable condensed waste material into the local streams and rivers. Even if it did not reduce pollution overall, the adoption of by-product coking embodied the win-win scenario long promoted by smoke abatement advocates. It turned lead into gold. The new institute was the alchemical laboratory.

Critics of the Mellons would also criticize the research efforts of Mellon Institute. Writing in the 1930s, the Mellon biographer, Wobbly and labor news service manager, Harvey O’Connor, emphasized how quickly the Mellon enterprise had departed from the realm of philanthropy and began to pay for itself. He also highlighted the way in which Mellon interests themselves, like Gulf and Koppers, were served by the research done
there. In contrast, Hersh, a more sympathetic biographer, emphasized the research done for competitors to the detriment of Mellon interests. Given the Mellon history of fluidity of investment, however, one must acknowledge that any successful industrial concern was potentially a Mellon interest. The critical O’Connor also characterized the institute as a place where inferior artificial substitutes for basic goods were concocted – to the benefit of industry and the detriment of the consumer. O’Connor’s examples were research leading to the reduction of yeast (for which, he said, white bread depends for nutritional content) in bakers bread. Sugar and yeast could be halved by introducing “a bacillus” into the recipe. According to O’Connor: “stockholders rejoiced, nutrition experts shook their heads.” He called this research the Institute’s “outstanding achievement in trying together science and business.”

Sensitive to these criticisms in later years, celebratory histories of Mellon Institute emphasized the institute’s involvement in projects for public benefit – which they called “pure science” – and downplayed its corporate chemical research. The Smoke Investigation and research on dental caries were the stock – and usually the only – examples given. These promotional materials used such projects to justify the institute’s existence by claiming that it was a promoter of the extension of comfort in service of the public good. At least in retrospect, therefore, MISI served a justificatory function for Mellon Institute itself. These considerations will be central to understanding the contested place of Mellon Institute research in the working out of Pittsburgh’s economic and civic trajectory.

In 1911 and 1912 the success of new industrial research efforts had depended largely on publicity that would draw enough fellowship business to justify continued Mellon investment. An undated Mellon Institute memo from this period puts forward the
idea of taking up “the investigation of public utility problems” as a “logical expansion” of its existing efforts to “throw open to those of the public having problems of this nature [problems in industrial chemistry]...the superior facilities of the University for research.”

The memo’s author, Raymond C. Benner, a newly hired Professor of Electro-Metallurgy at the University of Pittsburgh, argued for the establishment of investigations on topics including street car crowding, restaurant sanitation, impure water, tenement houses, cleanliness, causes and prevention of infectious diseases, the cost of living, and smoke. The list covered topics central to the Pittsburgh Survey. Benner pointed to investigations of railroad rates and taxes undertaken at the University of Wisconsin under the influence of Governor LaFollete as models. He had high hopes for turning industrial research into reform research:

In case we were given the income from a large endowment, portions of the same could be appropriated for the investigation of specific problems and arranged as separate fellowships.....In the case of education of the public at large on questions which can be solved in a scientific manner, the making public of the results could well take the form of an educational campaign.38

Benner hoped that the department could obtain “much legitimate advertising” from such a venture and that such research could lead to establishment of further fellowships to develop related industrial products like “ozonizers for water purification” and “smoke consuming apparatus.”39 Though the archival trail is not clearly marked, Benner seems to have become director, by early October of 1911, of the “R.B. Mellon Fellowship” clearly focused on smoke abatement. The Mellons, like Professor Holdsworth of the Economic Survey, had made their choice. Of the long list of civic and social problems Benner had put forward – from tenement houses to crowded streetcars – as amenable to industrial research style problem-solving – they had chosen smoke. Yet
connections to the concerns of the Pittsburgh Survey were central in the framing of the investigation. Ideologies of reform research, industrial research, and pure science would remain in tension with one another throughout the history of Mellon air pollution investigations. The R. B. Mellon fellowship would eventually support a staff of 25 full and part-time investigators, most from the faculty of the University of Pittsburgh, charged to examine all aspects of Pittsburgh’s smoke problem. Raymond C. Benner, though his expertise was narrowly technical, would serve as the first director for this wide-ranging effort.

The career of John Joseph O’Connor, later to become director of the Mellon Institute Smoke Investigation, most clearly illustrates MISI’s reform research beginnings. O’Connor graduated from the University of Pittsburgh in 1910. In November 1911, Benner had approached Holdsworth, under whom O’Connor worked on the Economic Survey, about making a study of the smoke nuisance. Holdsworth never did become part of Mellon smoke work, but by March 1912, when most of the Economic Survey had been submitted to the mayor and council, O’Connor was already on the smoke research staff and helping to shape the new investigation. Though such a recent college graduate, he already had connections with leaders in social work and academic sociology. In early 1912, O’Connor had met with Paul Kellogg in New York to solicit advice about how to undertake a survey of smoke in Pittsburgh.

O’Connor was also in close contact with C. W. A. Veditz, a prominent professor of sociology at George Washington University who would take up residence at the University of Pittsburgh for about six months in 1912 to develop a plan for an economic and quasi-sociological study of the smoke problem. It was to Veditz that Paul Kellogg
would send his detailed outline for such work in late February 1912. Kellogg suggested an investigation much like Margaret Byington’s *Households of a Milltown*, based on family budgets, which would determine how much more it cost families and businesses to operate in a smoky city. As we will see below, this is the form that O’Connor’s work for the smoke investigation would take. O’Connor continued correspondence with Kellogg throughout the years he worked on smoke for Mellon Institute and apparently at least intended to correspond with other former Survey investigators: either he or Veditz had asked Kellogg for the addresses of Crystal Eastman and Florence Kelly, among others.41

Early on it was clear that the issues raised by the *Pittsburgh Survey* were those of greatest interest to O’Connor. On May 7, 1912, O’Connor wrote to Kellogg:

> If I remain in Pittsburgh during the coming scholastic year I expect to take my Master’s Degree in Sociology and as a subject for my thesis I have thought, in view of the few remarkable changes that have taken place, of bringing the Pittsburgh Survey up to date. Perhaps you intend to do something along that line in the volume of the Survey yet to be published. I would like your advice in this matter. Perhaps in view of your familiarity of [sic] this subject you could suggest other subjects for my thesis.42

Kellogg responded encouragingly: “It seems to me you would find such a follow up of the Pittsburgh Survey a mighty interesting subject for a thesis,” and offered to help in any way he could.43 By September 20, 1912, O’Connor’s smoke responsibilities had crowded out the possibility of addressing the more general questions of social work. O’Connor wrote to Kellogg:

> In my letter of May 7th to you I told you that I had some idea of writing a thesis on a Follow Up of the Pittsburgh Survey”. I find now that my work in the Research Department since Dr. Veditz has left will take all of my time. I am going to attempt to have the University officials count my work on the economic survey and the smoke investigation as a thesis.44
In the late summer and early fall of 1913 Kellogg sent O’Connor to undertake some follow-up research to the Survey on his behalf. O’Connor reported to Kellogg on the largely improved conditions in Preston, the company town of the Pressed Steel Car Works, which had been criticized by the Survey.45 Throughout the smoke investigation, the Survey magazine, of which Kellogg was editor, would provide publicity for MISI and publish largely favorable reviews of its work.46

The investigation would publish ten bulletins (see Table 1 below) between 1911 and 1922 on a wide variety of smoke-related concerns: a survey of the sources of smoke in Pittsburgh and of combustion and abatement equipment in use, bulletins covering the effects of smoke on architecture, weather, vegetation, human health, on social and individual psychology, and on the economic life of the city. In 1922 it also published a comprehensive survey of available smoke abatement technologies.

MISI marshaled the Progressive Era’s proudest weapons, scientific and social scientific authority, to attack Pittsburgh smoke, an old and previously intractable problem. With the best expertise that Mellon money could buy, the investigation took up, one by one, questions that had long been raised about how to justify viewing smoke as a problem, how to apportion responsibility for smoke and how to systematically ameliorate it. MISI embodied Progressive science and expertise; its ambition was to offer an apolitical solution to longstanding civic problems. MISI’s inauguration was meant to show that “even in Pittsburgh” technological solutions, shaped by the results of universal science, and scrupulously deployed in accord with civic virtue, were all that were needed to reform the city. Yet, in MISI, scientific expertise would prove a double-edged sword,
### TABLE 1

**BULLETINS OF THE MELLON SMOKE INVESTIGATION**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Affiliation</th>
<th>Title</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anonymous</td>
<td></td>
<td>Outline of the Smoke Investigation</td>
<td>1913</td>
</tr>
<tr>
<td>Elwood H. McClelland</td>
<td>Librarian, Carnegie Library of Pittsburgh</td>
<td>Bibliography of Smoke and Smoke Prevention</td>
<td>1913</td>
</tr>
<tr>
<td>J. E. Wallace Wallin</td>
<td>Assistant Professor of Education and Psychology, Director of the Psychological Clinic, University of Pittsburgh</td>
<td>Psychological Aspects of the Problem of Atmospheric Smoke Pollution</td>
<td>1913</td>
</tr>
<tr>
<td>John J. O’Connor Jr.</td>
<td>Fellow in Industrial Research, University of Pittsburgh; (1911-14, Assistant Director of Mellon Institute (1914-18))</td>
<td>The Economic Cost of the Smoke Nuisance to Pittsburgh</td>
<td>1913</td>
</tr>
<tr>
<td>Herbert H. Kimball</td>
<td>Meteorologist, United States Weather Bureau</td>
<td>The Meteorological Aspect of the Smoke Problem</td>
<td>1913</td>
</tr>
<tr>
<td>Raymond C. Benner</td>
<td>Professor of Electro-Metallurgy (1911-13), Chief Fellow of the R. B. Mellon Fellowship (1911-12); Director of the Mellon Institute Smoke Investigation (1913)</td>
<td>Papers on the Effect of Smoke on Building Materials</td>
<td>1913</td>
</tr>
<tr>
<td>J. F. Clevenger</td>
<td>Botanist, Pennsylvania State College (later Penn State University)</td>
<td>The Effect of Soot in Smoke on Vegetation</td>
<td>1913</td>
</tr>
<tr>
<td>A. A. Straub/John J. O’Connor</td>
<td>Mechanical Engineer/ Fellow in Industrial Research, University of Pittsburgh (1911-14), Assistant Director of Mellon Institute (1914-18)</td>
<td>Some Engineering Phases of Pittsburgh’s Smoke Problem</td>
<td>1914</td>
</tr>
<tr>
<td>William Charles White and Oskar Klotz eds.</td>
<td>Professor of Medicine, University of Pittsburgh, Director, Tuberculosis League of Pittsburgh; Professor of Pathology and Bacteriology, University of Pittsburgh</td>
<td>Papers on the Influence of Smoke on Health</td>
<td>1914</td>
</tr>
<tr>
<td>Robert James McKay</td>
<td>(No identifying information available.)</td>
<td>Recent Progress on Smoke Abatement and Fuel Technology in England</td>
<td>1922</td>
</tr>
</tbody>
</table>
as many of its studies yielded ambiguous results, especially with respect to measurement of progress in smoke abatement and the relationship of smoke to human health.

Bulletins of the investigation exhibited uneven levels of investigatorial skill and thoroughness. The ideal of reform research brought with it a requirement of breadth that was in conflict with the intellectual ideals of the newly-formed graduate faculty of the University of Pittsburgh. Graduate education was based in disciplinary specialization and discipline-specific formation of intellectual standards. As Stephen Turner has noted, and as I have discussed in the previous chapter, reform research was the search for knowledge that could be put to social ends; it was not dispassionate data-gathering. Tensions over both the scope and the purpose of knowledge production in MISI would prove to be obstacles both to reform and to scientific understanding. The waning of the reform research ideal, which Turner takes as a necessary passing that made way for real social science, would, at Mellon, make way only for another kind of useable knowledge – industrial research for corporate profit. This transition, however, awaits a later part of the story. Through the first World War, the long shadow of the Pittsburgh Survey would shape work on smoke at Mellon Institute.

The Smoke Investigation was really an anti-smoke investigation, despite its explicit protestations to delineate the true limits of smoke damage and waste and the true costs to industry of smoke elimination. Investigators frequently found themselves eager to unequivocally denounce smoke on a scientific basis but unable to do so given the reasoning standards of their fields. Equally often, investigators working in fields in which controlled experiments and clear statistical standards for evaluation of evidence were uncommon, used the apparatus available in their own disciplines but drew conclusions
that it was unable to support. Work on smoke and health fell prey to both kinds of
difficulties, depending on the particular sub-field of study. The bulletin on meteorology
faced difficulties of the former kind and the bulletin on psychology faced difficulties of
the latter. In spite of these difficulties with scientific practice, MISI was still able to
speak against smoke with the voice of scientific authority. Yet its studies of smoke’s
damage to property, untroubled by the methodological complexities besetting the
investigations of smoke’s interactions with complex biological and geophysical systems,
spoke most clearly. The economic and architectural studies, while appropriating scientific
authority, were most powerful as articulations of new cultural values emphasizing the
importance of domestic comfort and civic beauty. These studies of the physical damage
to human artifacts caused by smoke provided further evidence of a reorientation of values
that allowed environmental amenities to be counted as legitimate economic goods. This
reorientation was so complete that MISI researchers were able, in the face of
inconclusive arguments about health and of unpersuasive arguments about fuel waste
(since Pittsburgh’s coal was cheap), to base exhortations to smoke abatement almost
entirely on damage to architecture, household furnishings and retail goods.

The first bulletin, an outline of the investigation, was published in summer 1912.47
Pittsburgh newspapers reported on even this first bulletin with interest. The Pittsburgh
Press emphasized the outline’s report on the unanimous opinion of previous investigators
that smoke meant wasted fuel and wasted heat.48 The Gazette Times noted that a copy of
the outline, a sixteen page pamphlet, “will be sent to anyone upon application.”49 The
investigation, as laid out in the outline, was to be divided into two parts: diagnostic and
remedial. Investigations into smoke’s physical and chemical nature as well as its
architectural, botanical, hygienic, medical, economic and psychological effects would come under the diagnostic heading as well as parts of engineering, legal and administrative investigations. Remedial efforts would include educational work, engineering work on technological solutions to smoke and investigation into legal remedies. As we will see below, they would also include formation of an “activist” anti-smoke organization to carry out the will of MISI. In addition MISI would publish a history of the smoke nuisance and a comprehensive bibliography of international work on smoke and smoke abatement.50

The outline’s description of the investigations underway highlighted their use of sophisticated scientific measuring instruments: “chemical and photometrical” methods of measuring sunlight in the meteorological studies, the use of the “ultra-microscope” as well as “photometric and electrical methods” to determine the physical properties of smoke, and animal experiments in the health studies. The outline lamented the inconclusiveness of medical statistics as reported by health departments in showing clear links between air pollution and ill health or increased mortality, but it anticipated a more careful analysis of such statistics by MISI investigators to provide more definite conclusions. In the remedial portion of the studies the outline looked toward the development of a smoke monitor, a device that would ring a bell alerting furnace attendants if excessive smoke was about to be produced – providing a technological substitute for human judgement.

The outline was emphatic about the importance of disseminating the results – whether or not they supported smoke abatement:
At all events, the formation of an enlightened public opinion upon the smoke problem is one of the principal objects of the whole investigation. Should it be found, for example, that certain diseases are less frequent and more easily cured in a smoky atmosphere than in a clear atmosphere, that fact will be made public property. Again, should it be discovered after careful inquiry that no way has yet been devised to prevent the emission of black smoke from certain classes of metallurgical furnaces, save at an expenditure that would greatly increase the costs of production this fact will likewise be made known. But if, on the other hand, both of these supposed conclusions are unfounded, it will be none the less necessary to publish the facts. Too often a public demand for certain reforms has been based upon imperfect knowledge or upon a mistaken notion of the factors involved.  

In this way the smoke investigation took on old assumptions about smoke’s healthfulness and the special needs of Pittsburgh’s characteristic industries to make smoke. Investigators approached them with avowed impartiality but with an underlying confidence that science would support smoke abatement. During 1913, the investigation’s next six bulletins were published, beginning with a comprehensive annotated bibliography on smoke and smoke abatement including over 1500 entries. Throughout 1912, Pittsburgh newspapers had reported on the investigation’s work, so at least some information from the investigations was made public before the release of the bulletins themselves.

4.4 Psychological Effects

The first of the bulletins published after the two introductory ones was J.E. Wallis Wallin’s “Psychological Aspects of the Problem of Atmospheric Smoke Pollution.” Wallin was recruited by the smoke investigation as a new assistant professor of psychology and education at the University of Pittsburgh. In 1912 he had established a psychological clinic at the University of Pittsburgh and would later become one of the
founders of the field of Special Education. He had been enlisted to take over the psychological effects bulletin after a Dr. Walker had given up on the project, concluding that he “did not see any chance of being able to get anything definite out of this work.”

Wallin examined direct effects of smoke on the psyche as well as the effects of smoke-induced weather changes and smoke induced somatic changes on mental well-being. He suggested that such effects could not be separated from one another without resort to controlled experiments – a step he was not prepared to take. Taking smoke’s effects on the body as a model for understanding its effects on the mind and emotions, Wallin allowed himself to endorse uncritically some of the very assertions about smoke and health that were under interrogation by MISI medical researchers. Wallin argued, for instance, that because some airborne chemicals, like lead dust, had been shown to cause or aggravate certain diseases, especially tuberculosis, by entering the body through oral ingestion, the same could be assumed about ordinary coal smoke. MISI’s pathologists would devote a considerable portion of their energy to eliminating the gastro-intestinal tract as a major avenue of entry for carbon from coal smoke into the body. They would also take pains to distinguish the effects of smoke, soot, and coal dust from one another and from the effects of other industrial dusts, as well as to separate the effects of smoke on tuberculosis from its effects on other diseases. Wallin felt free to beg all of these questions.

Nonetheless, Wallin seemed to be aware of preliminary results of MISI health studies. In fact, he spent much of his report rehearsing (or rehearsing in advance of publication) results of the other Mellon investigations. He also connected his own anecdotal musings to investigations underway. He suggested that the economic cost of
smoke, as investigated by MISI researchers, would surely be increased if one added the “degree to which mental and bodily efficiency of city dwellers may be impaired by atmospheric impurities” to the other costs of smoke. In support of this he quoted a Pittsburgh “business man” who claimed that people coming to work in Pittsburgh “notice a great depression” and the Pittsburghers working for a while in other, less smoky, cities “find they can do twice as much work.” The business man also remarked on the “depressed expression” of Pittsburgh’s workers, yet commented that this expression was also seen “in the clubs” of the upper classes.53

When Wallin did resort to the means of empirical psychological investigation available to him he found it necessary to ignore the results in order to condemn smoke. Wallin examined data on crime, misdemeanors in schools, prisons, and hospitals for the insane as well as bank errors. Only data on bank errors – committed in greater number on dark, foggy days – reflected badly on smoke. Violent crime, institutional misbehavior and suicide were all more common on bright days, either with high temperature and high humidity or on clear and dry days. Wallin conjectured that “dark, damp, smoky, foggy days are depleting or depressing just because... they are lacking in the tonic, health-giving rays of the sun.” This depletion of energy created a “devitalizing, depressing and inhibitive” effect on all action, decreasing, in the process, “breaches of law and order.” Murder rates in smoky cities were no higher than in bright cities. Suicide rates were lowest in smoky cities, leading Wallin to conjecture that in the absence of sunlight, suicides were not able to muster the resolve to carry out the act. Though there were “no studies” Wallin was heartened by anecdotal evidence from asylum workers that the insane were more excitable and depressed on cloudy days. He concluded: “From the
standpoint of the police courts depleting days are an undesirable asset. Granting the truth of this contention, let us not forget the complementary and more important facts presented in the preceding pages: namely, that gloomy, humid, foggy days (such days are produced by smoke-begrimed skies) lessen the vital potential, reduce or retard activity and impair efficiency, while bright, dry, sunshiny days increase the potential reserve, liberate energy, augment working capacity and stimulate ambition.” These conclusions were essentially reiterations of his initial assumptions, not based on any empirical research.54

The demands of reform research required Wallin to produce results that would inspire Pittsburghers to action, and so, he was driven to illustrate foregone conclusions with anecdotes and to repeat negative assertions about smoke unrelated to any possible psychological investigation. The comprehensiveness inherent in the survey model – the need to study the problem from all angles – induced the framers of the investigation to include studies of smoke’s psychological effects even if they knew in advance that they were unlikely to produce convincing results.

4.5 Economic Cost

The bulletin published next, John O’Connor’s study of the “The Economic Cost of the Smoke Nuisance to Pittsburgh,” had a simple methodology, rooted both in household budget studies such as those that Margaret Byington had conducted as part of the Pittsburgh Survey and in work other investigators had undertaken on smoke. Its results were widely-publicized and expressed the reorientation of cultural values that had taken place in Pittsburgh since the 1870s. The aim of the bulletin on economic costs was to
redefine the relationship of smoke to economic life – so that “the city and its people shall recognize that black smoke is not the economic asset that they have long held it to be.” Only a small portion of O’Connor’s study focused on fuel waste itself. He estimated, using data from the Pittsburgh smoke inspector’s office, that if the best smoke abatement standards were fully enforced, Pittsburgh fuel consumers would save 21.7% in fuel costs. O’Connor gives a clue in a later bulletin about his lack of emphasis on fuel economy in this section on economic cost: in MISI’s eighth bulletin, to be published in 1914, O’Connor would point to the low cost of coal in Pittsburgh as an impediment to smoke abatement.

Arguments which are advanced in other cities against the smoke nuisance have not the same value when they are advanced in Pittsburgh. It is so with the argument that smokeless combustion is economical. Efficiency tests of plants and mills may not reveal a very large monetary saving, under the most favorable condition of operation, when fuel is $1.25 or less per ton. Fuel economy was an old argument for smoke abatement. O’Connor referred to engineer and ironworks owner William Metcalf’s paper “Some Wastes of Heat” delivered before the Western Pennsylvania Engineers’ Society in 1881. O’Connor wanted to move beyond these arguments to new economic valuations of environmental amenities.

While the women of the LHPA had used health arguments to move smoke abatement from the category of luxury to the category of necessity, O’Connor used property damage and unnecessary labor arguments to fill gaps created by the incomplete understanding of smoke’s health effects. While O’Connor took smoke’s likely damage to health seriously, he shied away from putting an economic value on life and health lost to smoke since it “ha[d] been impossible as yet to secure trustworthy data.” The closest O’Connor came to connecting dirt from smoke to health was in his discussion of the cost
to hospitals of the extra cleaning necessitated by the presence of smoke. He prefaced his discussion by saying that physicians didn’t agree about the health effects of smoke and soot but that they did agree that it increased the costs to hospitals. Based on a survey of the superintendents of Pittsburgh’s hospitals he concluded that cleaning expenses in hospitals were 50-75% greater than they would be if Pittsburgh were smoke free and that smoke and soot added to the difficulty of keeping the operating rooms as clean as they should be. He acknowledged that physicians did not agree, beyond this, about the exact nature of smoke’s effects on health. Unlike his colleague Wallin, he was unwilling to summarize results under critical investigation or regard them as conclusive.

Another continual theme in the “Economic Costs” bulletin, as with other parts of the investigation, was the comparison of Pittsburgh with other cities. Ideas of Pittsburgh’s frontier uniqueness were left behind in a world in which numerous respondents were willing to compare Pittsburgh on equal terms with cities of the old East and of the newer West. Many of O’Connor’s surveys targeted Pittsburghers who had once been residents of other cities. The forms used solicited explicit comparisons. O’Connor also expressed Pittsburgh’s shedding of its exceptionalism by complaining of the absence of certain industries plentiful in other cities, rather than celebrating Pittsburgh’s leadership in the industries for which it was famous. He said that “the number of separate industries” in Pittsburgh “is not at all what it should or could be.” In doing so O’Connor echoed Pittsburgh Chamber of Commerce Concerns dating back to the 1890s. O’Connor systematically compared statistics on industries in Pittsburgh and Philadelphia from the 1910 census and concluded that the industries present in Philadelphia but lacking in Pittsburgh were those in which “atmospheric conditions
[were] almost as important as nearness to raw material, labor supply, rate of wages, transportation facilities etc.” or in which “the condition of the atmosphere..would either destroy or damage the product or place an excessive expense on the manufacturer in order to protect it from the effects of smoke and soot.”

He noted in particular the absence of textile industries in Pittsburgh and the difficulties smoke created for existing food preservation industries there (probably the prominent H.J. Heinz plant on the North Side). O’Connor’s aim was to emphasize the magnitude of the economic loss from smoke damage so that economic arguments for smoke abatement would no longer rest on claims of fuel economy sensitively dependent on technologies employed and the manpower entrusted with overseeing them.

O’Connor’s study took as economic many goods that would have been understood as outside of economic life in the 1860s and 1870s. Pittsburgh industrialists of an earlier era had treated smoke as a negative externality, a consequence of their decisions whose effects were borne only by others, irrelevant to their goal of making a living and a profit. They denied that smoke damaged goods of any importance: it threatened only luxuries and comforts associated with vice. As cultural ideologies changed allowing for differing valuations of the what pollution threatened, polluters could see themselves as sharing the costs of smoke with their neighbors. Thus what had previously been regarded as an externality became internalized. In the rhetoric of James Parton and of the newspapers and judge in Huckenstine’s appeal, smoke damage to furnishings, architectural ornamentation and clothing were taken to be luxuries, outside of the productive economic life of the city. In O’Connor’s study they were central to it.

Based on systematically distributed and analyzed questionnaires, O’Connor and his co-
workers estimated the additional cost of smoke in increased laundry and dry cleaning bills, more frequent exterior painting, wallpapering, sheet metal work, cleaning and removal of wallpaper and artificial lighting. O’Connor thought Parton’s claim about Pittsburgh was still applicable: “everything...was bought and arranged with reference to the ease with which its surface could be purified from the ever-falling soot.”

O’Connor also paid special attention in his investigation to the cost of smoke to retail establishments in damaged merchandise, extra precautions to keep merchandise clean, increased artificial lighting and janitorial costs. Several previous smoke cost estimates from other cities, which he quoted, were based on data gathered exclusively from department stores. O’Connor explained this emphasis, “Attention has been concentrated on the losses to stores because in smoky cities the damage to three or four of the large department stores is so great as to overshadow many of the other items of loss under consideration.”

O’Connor also estimated the costs for office buildings, hotels and hospitals, as well as private homes. He gave great weight to the reduction of property values by smoke and substantiated claims through a systematic survey of realtors. He pointed out that smoke had already been assigned an economic value in public life in relation to its depreciation of property values citing an October 1912 Philadelphia assessor’s report, which found decreased assessments on 300 city properties of between $500 and $2000 because the smoke nuisance had depressed sale prices. O’Connor referred to the “great number of court decisions in the various states where ‘smoke makers’ have been held responsible for damage to property and for lessening the selling value of property.”

In addition, O’Connor pointed out that “the fact that real estate firms, in their rent lists, mention that this or that house is in a neighborhood that is free
from smoke, shows that the smoke nuisance is no small factor in the letting of a house.”

He bolstered his claims with quotes from his survey of local realtors:

I have been in the business of renting houses for the past twenty-five years and I know the extent to which complaints have been made against the smoke nuisance, and of the repeated refusals of prospective tenants to rent houses especially exposed to the effects of smoke.\textsuperscript{62}

On a certain street in the North Side, we have five houses which have depreciated fully 50 per cent. in sale value and in rental value even a greater percentage. In years past, these houses were occupied continually with a good class of tenants and rents were 20 per cent. higher than at present, but we cannot keep more than two or three of the five rented at any one time, and as soon as the tenant becomes fully acquainted with the smoke nuisance, he vacates.\textsuperscript{63}

Although O’Connor’s survey was considerably more systematic than Wallin’s, he still relied, directly in many cases, on anecdotal claims of survey respondents to establish his conclusions. This created less internal tension in O’Connor’s work since it was conducted according to established social survey methodology and had minimal scientific pretensions.

Alongside O’Connor’s re-interpretation of various former luxuries as economic goods came another marked shift of civic values. In the 1860s and 1870s, as well as in the discussions at the Engineers’ Society of Western Pennsylvania in 1892, the luxuries to which O’Connor assigned economic value were viewed as decadent tastes of women and feminized men. In reality, such goods had to be maintained by the labor of women if they were to be enjoyed by anyone. When O’Connor estimated the economic cost of smoke to Pittsburgh based in part on housewife surveys,\textsuperscript{64} he acknowledged rather than minimized domestic maintenance and cleanliness. He assigned laundry and wallpaper cleaning and replacement a monetary value, provided that they were done by someone other than a housewife. He maintained that such work wore down housewives, but the
judgement that the work was worthless was mitigated by the prominence of its costs when done by hired laborers. O’Connor and other researchers took middle class living standards, reliant on environmental amenities and on the labor of women to maintain the domestic environment, as the ideal for all homes in Pittsburgh. When MISI architects discussed the mechanism, extent and cost of smoke damage to building materials, decorations and indoor furnishings, they appreciated the link between domestic cleanliness and the maintenance of “the common standard of living.” The costs of smoke in domestic and private life were central to the economic study. While the matter of coal waste was addressed, it was given far less weight than smoke’s effects after it had left the chimney. O’Connor’s regard for domesticity and private life have one source in his connections with the social service community whose interest was in the investigation of such matters. His close ties to the Pittsburgh Survey led him to regard domestic matters as important.

4.6 Meteorological Aspects

In the next bulletin published, “The Meteorological Aspect of the Smoke Problem” Herbert H. Kimball, PhD meteorologist, employed by the United States Weather Bureau, as well as MISI, carefully analyzed the effects of smoke on weather conditions. Departing from the usual orientation of the anti-smoke movement toward visible components of smoke alone, Kimball showed an acute awareness of the separate importance of smoke’s many components. Kimball used Pittsburgh itself as a laboratory in which to develop conclusions about air pollution that would be universally valid and internationally relevant. Kimball expected pollution effects in Pittsburgh to be more
intense than those in the world as a whole – and therefore to be easier to understand definitively. Kimball did not immediately accept the popular assumption that fogs were more frequent in the city than in the country but went on to test anecdotal claims that fogs had been less frequent in England since the enforcement of smoke abatement regulations and that there had been fewer fogs in Pittsburgh during the city’s natural gas period. He concluded that both sulphur dioxide and carbon particles helped in the formation of fog and that moisture absorbing soot particles prevented its dissipation. Fog droplets themselves were more persistent when coated with tar from coal smoke. He carefully correlated temperature ranges in the city with periods recorded by the local weather bureau as more or less smoky and also compared the temperature ranges in Pittsburgh with those of several topographically similar, but less smoky, nearby cities. Kimball quoted US Weather Bureau studies correlating limit of visibility (calculated to correspond to certain densities of dust particles in the atmosphere) in the city with daylight intensity as measured by rates of oxalic acid decomposition, but he also critically evaluated data on the percentage of possible sunshine received by seventeen large cities. Initial results showed that smoke had little effect, but when Kimball made necessary corrections for light intensities at dawn and dusk, when the light was too weak to be mechanically recorded (human corrections were always necessary given the measuring apparatus in use), the effects of smoke were evident.

Kimball concluded from his investigations that city fogs were more persistent than country fogs because smoke accumulated in them and that this resulted in fewer hours of sunshine and less intense sunlight in cities than in the country. He also concluded that smoke prevented heat from escaping from cities at night, reducing the
diurnal range of temperature in the city. Kimball demonstrated that on smoky or foggy
days, with equal hours of sunlight, the chemical action of daylight was closely related to
the limit of visibility, which in turn was related to the density of particulates in the
atmosphere. From his limit of visibility studies, Kimball announced that visibility in the
business section of Pittsburgh was one tenth that in the open country, and that on smoky
or foggy days the chemical action of daylight was only 75% what it would otherwise
have been. Kimball was careful and critical in his researches, recognizing and correcting
for the limits of his measuring apparatus and the ways in which artifacts of measurement
could produce spurious conclusions about smoke. He found, in Pittsburgh, a well-
equipped laboratory in which to test claims about smoke’s meteorological effects.
Kimball was lucky that the results of his investigations, conducted according to the
standards of his own discipline, served the purposes of reform research at MISI. Yet,
since they only served to bolster widely held popular views, they could not add much
new impetus to the popular anti-smoke sentiment that it was MISI’s mission to arouse.67

4.7 Effects of Smoke on Building Materials

Raymond Benner was as careful as Kimball in the work he directed on the effect of
smoke on building materials, the next bulletin published by MISI. He and his colleagues
also took smoke apart into its components and asked about both individual and combined
effects. Benner, however, began his report in a polemical spirit, complaining about public
apathy and calling smoke the “greatest blot on our industrial centers.”68 Benner was
particularly concerned with the capacity of soot to absorb corrosive acids of sulphur and
with the ability of tar containing soot to allow these corrosive compounds to adhere to
surfaces with which they came in contact. Benner’s investigation was also shaped by Mellon Institute’s wider involvement in industrial research. His evaluation of paint-industry sponsored studies shows the newly recognized economic relevance of smoke as environmentally damaging rather than simply as wasted fuel. Nonetheless, investigators continually referred to the “wasted fuel” argument as a pre-existent reason to find smoke objectionable, a reason independent of their own research.

An investigator working under Benner, architect Richard Hooker, reported on a research project funded by the National Paint Manufacturing Association which seemed to show that soot acted as a protective coating for paints. Hooker evaluated the evidence that “wasteful combustion of coal” provided a free extra coat of paint. Hooker’s own further researches led him to conclude that paint applied over soot deteriorated more rapidly than other paint because it was attacked by the acid in soot from both above and below. Hooker surveyed master painters around the country about the costs of painting, repainting, cleaning and treating painted wood. Painters’ responses indicated that paint costs were considerably higher in smoky cities. He called this a major “extra tax” for city dwellers.69

The building materials studies revealed some of the complexities of setting economic considerations of damage due to smoke against the background of older distinctions between the economic and the aesthetic. K. K. Stevens, a consulting chemist at Carnegie Institute of Technology, examined smoke’s effects on paint. Stevens consciously separated paint’s two purposes: protection and decoration. Separate consideration of these two factors and the ways Stevens considered their relative priority reveals the ascendance of values that would have been dismissed in the Pittsburgh of the
1860s and 1870s. The conscious contrast between the two kinds of smoke damage, however, reveals how difficult it was to place threats to aesthetic values on the same footing as damage to functional capacities. Stevens analyzed smoke damage to test fences set up by the National Paint Manufacturers Association in Pittsburgh, Atlantic City, NJ, Fargo, ND and Nashville, TN. Panels were exposed to air, and then washed with water; the washing solutions were then chemically analyzed. He concluded that the most important effect of smoke on paint was the action of the deposit of tar and carbon both in darkening the paint and through the adhesion of occluded sulphur gasses causing it to deteriorate. Stevens, after making an initial distinction between deteriorative and aesthetic effects was unable to separate them when analyzing his results.70

Benner, however, made use of the distinction in his own report on the effects of smoke on stone and opposed the aesthetic to the practical and economic. But he went on to point out the ways in which tar and sulfur acids acting together turned aesthetic problems into economic ones. He complained about the ways in which buildings in a city like Pittsburgh began to deteriorate in appearance from the moment they were built: “It is not alone the question of aesthetics that we have to consider, for the corrosion caused by the acids makes the problem eminently a practical one and in many ways a matter of dollars and cents.” Quoting British sootfall studies, Benner remarked that in smoky cities “the rapidity with which buildings become unsightly is almost beyond belief.” Benner then quoted MISI’s own sootfall studies (to be discussed below) as suggesting that if Pittsburgh’s “amount [of soot] were ground with oil so as to form black paint, it would cover from 17 to 57 square miles with two coats.” Benner, following Stevens, separated the effects of soot from soiling (caused by tar, carbon and their combinations) from the
corroding and weathering effects of the acids. Benner stated that without tar, carbon and
ash did little since they were easily removed, but that with tar carbon stuck to surfaces
and could only be removed by cleaning processes destructive to the buildings themselves.
Sulphur acids according to Benner had the worst weathering effect and were most
destructive when occluded in soot.

Benner’s views of architectural smoke damage accorded well with the
disposibility and extrinsic and instrumental valuation of cities such as Pittsburgh. Benner
quoted British studies on the action of sulphuric acid on mortar and remarked that in
America old buildings were quickly replaced so gas corrosion was not as large a problem
as in Britain. Benner concluded that smoke products hurt stone in both aesthetic and
materially destructive ways. Soot soiled the surface of stone so that in a few months all
new buildings looked grimy and gray with their “artistic effect” and “color contrast”
ruined. Destructive cleaning processes then became necessary. Benner remarked that in
most places “time mellows, with many a compensating touch, the noble productions of
former generations.” But in smoky cities time only destroyed.71

Carlton Strong, writing on the protection of stone from smoke, summed up the
consequences of smoke’s damage to the built environment:

The truth is that the smudge – which we have so long accustomed ourselves to
accept as an essential concomitant of industrial prosperity – has not merely taken
the natural beauties of tone and color from our every outlook and changed them to
a sullen and sordid hue, but it has entered the chimney as wasted fuel and left it as
a destroyer of property. In short, smoke from beginning to end, throughout all
phases of its baneful existence, takes from the pleasure, and adds to the labor, as
well as the cost of living.72
This view of labor as bad and pleasure as good contrasts with Pittsburgh’s traditional, but now attenuated, Scotch-Irish Presbyterian ideology.

The importance of such new values is even clearer in the studies in this bulletin connected with the deterioration of interior decoration. Architect E.B. Lee surveyed buildings – all “occupied by people to whom cleanliness and freedom from the soot is a large factor in making life easier and more pleasant.” Presumably he referred to those whose economic status and cultural orientation allowed them to keep their houses relatively clean, even in Pittsburgh. Lee spoke first of the fine sprays of soot along white mats of framed pictures and on pictures themselves. The question of smoke’s effects on interior decoration was one in which aesthetic factors stood alone, since sulphur damage inside was much less than that outside. Lee faulted soot as the most important indoor consequence of smoke. It “impair[s] appearances and cause[s] an enormous amount of extra, expensive and unnecessary work and care in keeping working and living quarters in a condition as is required by people who are accustomed to the common standard of living.” Lee assumed an upper middle class standard of living in which aesthetics and consumption were central. He explicitly left aside any questions of the sanitary implications of indoor soot. Lee lamented that owners censored decorators’ choices of “cheerful fresh colors” or difficult to clean wall coverings and complained of their preference for “heavy colors” like red or brown. He lamented the frequency with which lace curtains had to be changed and the elimination of “silk hangings” in Pittsburgh decoration since it was difficult to clean the soot out of them without destroying them.73

Benner concluded the bulletin with a lament over the oppressive limitations imposed on architects in Pittsburgh by smoke – limitations which kept them from
“striving for the highest ideals.” Light colors, sharp lines and decorative details that would be destroyed by cleaning must be omitted. Benner said that in a smoky city the architect “builds for the day of sale,” since buildings inevitably begin to deteriorate immediately due to smoke. Under such conditions, market transactions were the only source of value.74

4.8 Effects on Vegetation

The last bulletin published in 1913 was “The Effect of the Soot in Smoke on Vegetation” based on research by Penn State biologist J.F. Clevenger. Like Wallin in the Psychological Effects bulletin, Clevenger complained of inadequate time and money available to produce reliable conclusions. Unlike Wallin, however, he did not resort to anecdotes or accept survey data uncritically. Instead, he confined himself to limited – if relatively uninteresting – conclusions derived from his experimental results. Clevenger apologized that “observations have not been so numerous as might have been desirable” but still felt “that they will warrant the conclusions drawn.” He apologized for his “meager” data due to inadequate time to complete his investigations. Time limitations were also a consequence of the adherence to the social survey model. Social surveys gathered data, analyzed it and then urged their audience to act on it. The survey model would not support long-term scientific research.

Clevenger began by surveying the effects on plants of everything from tobacco smoke and illuminating gas, to the specific sulphur gases of coal smoke. He undertook to verify the claimed effects of smoke and soot in the existing scientific literature. Such studies suggested that he look for the corrosive action of gases, the clogging of stomata
by tar, and the damage to the nutrient value of soil by various components of smoke. Plants exposed to such substances had in other studies shown corroded and small leaves and narrowing of annual rings.

Following common MISI methodology Clevenger sent out questionnaires to gardeners and florists around Pittsburgh. He took seriously their observations that most plants did not thrive as well as in Pittsburgh as in other cities and their nearly unanimous causal attribution of this fact to smoke. Clevenger regarded the causal claim as subject to further testing. He divided both Pittsburgh and the smaller mill town of Aliquippa into regions based on smoke exposure – proximity to industry and railroads and wind direction – and observed the state of plants in each of the regions – condition of foliage and size of annual rings. After verifying that the local weather conditions during the period of experiment were not unusual, he concluded that the narrowed rings and dying leaves he observed were due to smoke exposure. Clevenger had also expected to see plugged stomata in smoky regions, however, but found no more of these there than in the nursery at State College.

Clevenger followed these observations with a series of controlled experiments in which plants were subjected to a year’s worth of soot over the course of a few weeks. He generally, but not universally, found serious deterioration in the soot-exposed plants. In two of the five experimental groups the plants remained in good condition. He considered objections to his experiments that such intense short term exposure was not really equivalent to the kind of exposure met with in real life, but had little to say except that the quantities of soot were equivalent. MISI, in this situation, faced a difficulty common in environmental and public health research in which intense short term exposure must,
for the practical purposes of finishing experiments and publishing results, be substituted for longitudinal studies that more closely mirror real environmental conditions. Such longitudinal studies were not possible within a survey framework such as MISI’s.75

4.9 Final Bulletins of Initial MISI Work: Health Effects and Emissions Survey

MISI published its most important and detailed bulletins in 1914: Bulletin 8, “Some Engineering Phases of Pittsburgh’s Smoke Problem” and Bulletin 9, “Papers on the Influence of Smoke on Health.” The Engineering Phases bulletin presented a comprehensive survey of the sources of smoke in Pittsburgh and of actual means of smoke amelioration then in use or available. It presented a judgement of responsibility for Pittsburgh’s smoke problem and a plan of action for its abatement. The health effects bulletin was far less rich in positive practical consequences for smoke control and showed the way in which Progressive hopes for scientific backing for smoke abatement would be disappointed.

4.9.1 Health Effects

The health effects bulletin comprised reports of five separate studies plus an introduction and literature review. The difficulties of finding support for smoke abatement in Progressive Era science were particularly clear in MISI’s work on smoke and health. University of Pittsburgh pathology and bacteriology professor Oscar Klotz admitted that “small quantities of smoke” had “no harmful effect upon the tissues” but believed that “continuous accumulation of carbon may act quite differently” and that the question needed “further attention.” Samuel Reese Haythorn, Assistant Professor of Pathology and
William Ludlow Holman, Instructor of Bacteriology, both at the University of Pittsburgh, examined histological changes induced by smoke relevant to pneumonia and tuberculosis. They found that smoke promoted disease progression in one case and healing in the other. William Charles White, Tuberculosis League Medical Director and University of Pittsburgh Professor of Medicine, felt constrained to admit, in his introduction, that while research seemed to have shown that smoke increased susceptibility to acute lung infections, “the relation of smoke to tuberculosis [was] one of greatly divided opinion” and that “if smoke has any influence at all, it is not a harmful one.” White added: “If...tuberculosis is not influenced by smoky atmosphere, it is time to stop the utterance of this popular fallacy which can do naught other than harm in sacrificing the confidence of the public in those who should guide them.”

University of Pittsburgh Professor of Anatomy Benson Ambrose Cohoe explained that MISI investigators experienced “much difficulty...in arriving at definite conclusions, because the present state of our knowledge does not admit of satisfying and positive pronouncements.”

Cohoe’s literature review was structured to reflect the tenuousness of claims that smoke threatened health: it was divided into sections devoted to evidence “favorable towards smoke,” “positive” that smoke damaged health, and “doubtful” that smoke affected health. Nonetheless, Cohoe himself was certain that polluted air influenced health even more than impure food or contaminated water. After all – daily air intake dramatically exceeds the daily intake of either food or water – on whose purity much Progressive energy had been expended. Cohoe held up the “triumphs of modern sanitation” and the “successful assault” waged on “typhoid fever and cholera” by “close
surveillance of the water supply and sewage disposal within our cities” as models of progress to be made against disease through control of air pollution.77

Cohoe scornfully related accounts of fires burned in London in times of plague and regarded as absurd the practice of the tubercular of resorting to coal mines for cure. He called studies (by Trotter) suggesting that anthracosis (carbon pigmentation in the lung) conferred immunity to pulmonary tuberculosis on coal miners “a fancy.”78 Cohoe believed that such claims had been definitively overturned by “more careful recent investigation.” He devoted more careful consideration to “evidence of a doubtful nature” which he took to be the opinion of scientists inclined to regard smoke as harmful but who, “in a spirit of scientific conservatism,” considered its harmfulness unproven. Many physicians found that death rates in industrial towns were high but were disinclined to attribute the high death rates to the single cause of polluted air. Other investigators found that smoke was in some ways injurious but also recognized its “excellent germicidal and disinfectant properties” and then faced the problem of deciding “which influence is stronger.” The situation was complicated by imperfect mortality statistics and imperfect knowledge of which regions were particularly smoky.79

The culmination of Cohoe’s literature review was his discussion of work by Dr. Louis Ascher of Konigsberg who investigated smoke both statistically and through animal experimentation.80 Ascher found increasing rates of mortality and morbidity from acute respiratory disease (since 1875), particularly in industrial centers. His statistics showed an increase in death from non-tubercular lung disease in Prussian industrial districts of 500-600%, from 1876 to 1901. Ascher was able to assert that these differentials were not due to poverty, since industrial districts were more prosperous than
agricultural ones. Statistics from England and America showed similar trends. Ascher was convinced that occupational exposures were not responsible, since the pattern was also evident among infants and the elderly. Ascher concluded: “The cause of this increase can only be the smoke of coal fires.” Ascher attributed miners’ low tuberculosis rates to the fact that miners instead died of acute lung diseases at rates of 135% of those of the general male population. He believed that mortality was not linked to opportunity for infection but to lowered resistance due to coal smoke exposure. He also showed that tuberculosis patients tended to die earlier in industrial districts than in the country but attributed this to secondary infection due to acute lung disease promoted by smoke exposure.

Ascher attempted to confirm his statistical conclusions with pathological observations but failed to procure enough bodies. Instead he did animal experiments to determine whether smoke exposure caused acute lung disease in rabbits and to see whether smoke promoted a more rapid course of tuberculosis in his experimental group. Using inoculated animals, some exposed to smoke and some as controls, Ascher found both increased incidence of acute respiratory diseases and a hastening of the course of tuberculosis in the smoke-exposed animals. Cohoe reviewed the findings of researchers who had attempted to replicate Ascher’s work. Several had obtained similar results, but in general scientists were reluctant to attribute the effects Ascher established to the single cause of coal smoke. A desire to confirm Ascher’s results where others had failed suggested many of the questions MISI researchers would address.

Cohoe next went on to review research on the action of individual components of carbon on health, particularly the fate of inhaled carbon particles and the establishment
of pulmonary anthracosis. He examined work by Sir Thomas Oliver, renowned
Newcastle expert on occupational dust diseases. Oliver had concluded that dusts could
change the spongy lung tissue into fibro-connective tissue resulting in pulmonary
fibrosis. Oliver’s results with soot had important consequences for the way in which
carbon exposure came to be viewed among researchers in occupational disease, the most
important community for investigation of environmentally induced illness. As we have
seen in the last chapter, carbon dust had been widely regarded as the least dangerous of
occupational dusts. Some had even regarded it as antiseptic. Oliver believed that coal
dust acted against tubercle bacilli and that soot “increase[d] the action of incipient
tuberculosis” but protected against infection itself. Others believed they had shown with
animal experimentation that soot did not inhibit tuberculosis. Cohoe reported on work
showing that experimental animals suffered little from soot exposure but developed
severe pneumonia when exposed to soot suspended in fluid.83

Cohoe also reviewed the literature on the effects of the gaseous constituents of
smoke (carbon dioxide and monoxide, sulphur and arsenic compounds, and nitrous and
chloric vapors) on health. Some researchers, conducting experiments with filtered smoke,
smoke with particulates removed, had concluded that although carbon was most
productive of some symptoms, gases (carbon monoxide, carbon dioxide, and the acids of
sulphur) alone could poison, even in the concentrations found in smoke.84 Cohoe
concluded by quoting researcher John Mehrstens: “These facts show that any smokeless
furnace...has little value for the public as far as the purification of the air is concerned
unless the dust and sulphurous acid are retained at the same time.”85 Such a reaction to a
review of the literature on smoke and health had the potential to move anti-air-pollution sentiment beyond the usual arguments for the abatement of visible smoke.

Cohoe next turned to research on the indirect effects of air pollution on human health through its promotion of fogs and its effects on temperature and sunlight. Many researchers had observed elevated death rates coinciding with the onset of fog and offered many speculations as to the mechanism, including both increased bacteria counts. No consensus seemed to exist among researchers as to whether fog itself, or the associated temperature drop, was the cause of higher death rates. Cohoe also reviewed evidence on the action of smoke in the diminution of sunlight. Sunlight was universally valued for its general metabolic effects as well as for the germicidal power of its ultraviolet rays – those most easily blocked out by smoke. Sunlight obstruction was easiest to prove among smoke’s detrimental health effects, yet opinion on it was still somewhat divided.86 Cohoe concluded by quoting a Dr. Evans of Chicago: “A spotless town is more apt to be moral than a dirty town. It is very hard to get the streets, the yards, the clothes, the people, clean.”87 He quoted other researchers who connected smoke with degeneracy and the negative health effects of smoke-induced avoidance of fresh air. Claims for smoke’s health effects were weak and ambiguous, as is evident from Cohoe’s recourse to anecdotally-based clichés to sum up the latest medical research.

The original research undertaken by MISI, reported in the remaining papers of the bulletin, took up a small subset of the issues raised in Cohoe’s literature review. In general researchers were most concerned with the effects of carbon, rather than smoke’s other components, on acute and chronic respiratory disease, and with the effects of smoke and soot on bacterial life.
Oskar Klotz carried out comprehensive pathological studies of the lungs of Pittsburghers to determine the mechanism by which carbon injured health. Klotz tabulated the quantity of carbon in the lungs of Pittsburghers on autopsy and established it to be significantly greater than in lungs of those who had resided in the less smoky environment of Ann Arbor, Michigan. Klotz, after pathological examination, concluded that “infrequent presence of tuberculosis amongst those developing extensive anthracosis has its explanation in certain anatomical changes in the respiratory system” especially the obstruction of lymphatic channels caused by anthracosis. These sorts of results hardly lent themselves to the sorts of applications hoped for from reform research.88

Samuel Haythorn built upon these results in his paper “Some Histological Evidences of the Disease Importance of Pulmonary Anthracosis.” He sought to establish “whether or not extensive deposits of dust and coal pigment within the body tissues have or have not any ‘real disease’ significance.” Haythorn outlined the anthracotic process in great detail and then examined the association of various states of anthracosis with tuberculosis and pneumonia through histological analysis of tissues from animals exposed to smoke and soot in controlled experiments. He also did histological examinations of human lungs from autopsies. The obliteration of lymphatic structures by anthracosis actually appeared to aid the walling off of bacilli and was therefore important for the healing of tuberculosis lesions. Haythorn concluded overall that moderate anthracosis in the normal lung was “not in itself detrimental to health” and could in fact be “active in assisting health.” His results would effectively eliminate arguments against smoke as a cause of tuberculosis. Since tuberculosis was a disease for which public health authorities, including the MISH’s own William Charles White, conducted high
profile prevention campaigns, smoke abatement stood to lose a powerful and popular source of motivation.

Haythorn found the relation of pneumonia and anthracosis to be very different from the relation of tuberculosis and anthracosis. In the case of pneumonia the disease resolves itself through drainage of fluid and debris through the lymphatic system, rather than through fibrosis and encapsulation. In this case the obliteration of lymphatic structures impeded healing because it impeded drainage, leading to abscesses, swelling and gangrene. Haythorn examined anthracotic conditions and pneumonia through microscopic study and found that 25% of cases were unresolved, a higher percentage than one would expect in pneumonia cases overall. He concluded that in acute inflammatory conditions where the lymphatics are important for the resolution, anthracosis was “seriously detrimental” because of the obliteration of the lymph spaces. Pittsburgh had a high pneumonia death rate and urban pneumonia rates had been rising internationally for some time. Nonetheless, pneumonia affected the very old and the very young disproportionately. It never took on the popular drama associated with the protracted struggles with tuberculosis among those in the prime of life. Pneumonia emerged as a major public health problem later in the development of bacteriology than tuberculosis did. As we shall see below, responses to pneumonia would be more clearly circumscribed within a curative bacteriological rather than a sanitarian or environmental framework.89

The importance of bacteriology in evaluating all matters relevant to health was evident in MISI research. W. L. Holman conducted careful observations of bacterial growth in outdoor soot collection containers and attempted to grow bacteria in known
soot solutions within the laboratory. Holman found soot to act as a germicide through its acids, its phenols, and its tendency to absorb moisture. He found that soot particles were generally sterile, and that bacteria did not grow in smoky air. Holman, however, did verify that smoke reduced the germicidal properties of sunlight – and so was protective of germs.  

William Charles White and Charles Howard Marcy, a demonstrator in Medicine at the University of Pittsburgh and a junior colleague of White’s at the Tuberculosis League, examined relations between smoke and pneumonia and tuberculosis mortality. They reprinted a paper in the bulletin which had been presented at the International Congress of Hygiene and Demography in September 1912. White and Marcy claimed to be able to show strong correlations between smoke and pneumonia mortality by ward and to “rule out a number of other factors, such as poverty, race [and] congestion... as an influencing factor in the point of relation.” They admitted however that the “figures...we have obtained are, from one aspect, very convincing, although from another aspect very confusing.” Before discussing the Pittsburgh data by area, White and Marcy examined comparative death rates among cities and compared them to United States Weather Bureau data on smoke density based on visibility. These data revealed puzzling anomalies: clean Boston had a very high pneumonia deathrate, as did Mobile, AL with smoke levels much lower than Pittsburgh (and the more climatically comparable, St. Louis). White and Marcy regarded these city by city comparisons as utter failures to show any correlation.

They then turned to the Pittsburgh data in which they claimed to have found a “striking” correspondence between smoke and pneumonia rates. No such correlation was
to be found for tuberculosis. White and Marcy turned to the results of other MISI researchers on anthracosis and pneumonia and tuberculosis to explain their own conclusions. White, long active in anti-tuberculosis work in Pittsburgh, ended the paper with recommendations for pneumonia prevention to be undertaken by individuals, even after his own study had strongly linked pneumonia mortality with ambient air. White remarked:

One cannot help wondering why, when the facts concerning these two diseases are known so little has been done on the question of pneumonia prevention, when so much has been accomplished on the tuberculosis side.\(^9\)

White, quoting a speech he had given in 1911 to the Ontario Medical Association, presented a strange mish-mash of germ-scare prescriptions and New Public Health concerns. Pneumonia prevention was to be modeled on anti-tuberculosis measures long underway:

The instruction of the public by pamphlets and school lectures on the necessity for keeping the noses and throats cleansed, especially during winter months; the necessity of controlling the dust of streets by better sprinkling and night sweeping; the evils of bad ventilation in house, public building and school; of alcohol, of badly cooked poor food; of lack of rest; of worry; of handkerchiefs; of the bearing on pneumonia of spitting...of the increased resistance generated by open-air sleeping....\(^2\)

He did not here recommend smoke abatement for pneumonia control, though he did call for it in a second MISI contribution.\(^3\)

White’s second contribution, written with non-MISI investigator Paul Shuey, was a response to criticisms of the earlier paper. White and Shuey stood by the “rough ratio” they had reported between smoke in a city and its pneumonia deathrate and the “inverse ratio” between smoke and tuberculosis deaths. They responded, point by point, to a critical letter written to them by Dr. John S. Fulton, Secretary of the Congress of Hygiene
and Demography. He had suggested that before such city to city comparison could be
done, the proportion of the population in the “pneumonia ages” had to be considered.
Consideration of this would explain the high pneumonia rates in Boston despite its lack
of smoke. White and Shuey redid the study dividing cities into groups by smoke level
and comparing age groups to corresponding age groups in terms of TB and pneumonia
mortality.94 White and Shuey alleged anomalous smoky-day reporting in (still
anomalous) Boston, but claimed that they had found a “noticeable similarity” in
Pittsburgh, St. Louis, Cincinnati, Chicago, New Orleans and Richmond in the relation
between the pneumonia deathrate and the number of smoky days. Neither Shuey and
White’s nor Marcy and White’s studies, evaluated their results with respect to any
standard of statistical significance.

MISI staffers distributed press releases to the local papers on the day the health
effects bulletin was published, November 29, 1914. Articles based on them emphasized
the unanimity of investigators on the links between smoke and acute respiratory diseases
(and the connection’s independence of poverty). They glossed over smoke’s neutral and
positive effects on tuberculosis.95 Other articles discussed both negative and positive
effects of smoke and smoke-induced weather states on bacteria, linking these with acute
respiratory disease. The positive effect of anthracosis on tuberculosis healing was
mentioned in passing, with the mechanism by which smoke exacerbated pneumonia
described, at length, immediately afterward.96 Headlines included “Smoke Has Great
Influence on Increasing Mortality” and “Smoke Causes Much Illness...Carbon
Deleterious.” While the mixed results of MISI studies were reported to the press, they
were presented in ways that downplayed their ambiguity. Re-packaged results could not
satisfy long-held hopes for scientific support for smoke abatement, based on health effects.

4.9.2 Emissions Survey and Directives for Action

Like the Health Effects bulletin, the “Engineering Phases” report was the product of two years work at MISI. Unlike the smoke and health studies, however, there was little ambiguity in its results. The difficulty would come in the implementation of its clear directives for action.

The Engineering Phases bulletin began with the sanguine epigram:

There is nothing impossible or wonderful about smokeless combustion of even Pittsburgh coal, provided the proper methods are applied and the ordinary precautions taken.97

John O’Connor edited the bulletin, though engineer A. A. Straub had oversee most of the work.98 O’Connor and Straub called the city’s smoke current smoke ordinance, “one of the most lenient...of any large city in the United States.” Yet the MISI survey found that fifty per cent of hand-fired plants and sixty percent of front feed stoker plants were violating it. They identified the two main sources of smoke in both the city and surrounding district: manufacturing plants, including special metallurgical furnaces, and locomotives. They lamented the local cheapness of Pittsburgh coal as an impediment to smoke abatement based on fuel economy, a chief argument used in other locales. Because of the local cheapness of fuel, little effort had been made to conserve it in boiler plants and almost no effort in the metallurgical furnaces. In examining the history of Pittsburgh’s smoke nuisance, O’Connor regretted the passage of ordinances that protected heavy industry. As we have seen in the previous chapter, both the 1892
ordinance and the 1911 ordinance in force until just before publication of the bulletin had exempted mill puddling and heating furnaces. He and Straub clearly singled out manufacturing plants as Pittsburgh’s worst smoke offenders, and suggested that with the right smoke abatement improvements to such plants they could save 30 percent of the fuel used.

Pittsburgh’s concentration of capital in heavy industries was also a determining factor in its smokiness. In 1910 the census reported that the Pittsburgh District produced 11% of the world’s pig iron, 30% of all American-made steel, 50% of the nation’s steel railway cars, and 66% of its glass. In 1909 73.9% of the manufacturing horsepower put to use in the city and 80.7% of the manufacturing horsepower used in the district were applied to manufacturing of electrical machinery, to foundry and machine shop production and to iron and steel blast furnaces, rolling mills, and other iron and steel working establishments. In 1909, these heavy industries accounted for 95.5% of Pittsburgh’s capital investment and 60.9% of total expenditure for fuel and power.99 The Pittsburgh district, according to figures from the office of smoke inspection, was the largest consumer of bituminous coal in the world and if one adds coke and gas consumption “the District becomes the greatest user of fuel in the world.”100 Smoke from the residence and business sections, the latter emphasized in earlier smoke abatement campaigns, contributed minimally to the total problem. O’Connor and Straub took locomotives to be the next worst offenders and suggested fuel substitution and eventual electrification for them. Emphasis in any smoke abatement campaign truly based on the report and Straub’s researches would have to focus on the industries central to Pittsburgh’s identity and economy.
The investigators tried to map smoke production. It was this bulletin that reported the results of MISI’s first “sootfall study” in which open outdoor collection containers were placed at various stations about the city. The soot was analyzed to determine the amount of each component – tar, fixed carbon, ash, and iron oxide – that would fall per square mile per year in the area of collection. The study also analyzed wind direction to determine which areas of the city should have been smokiest under various wind conditions. O’Connor and Straub compared the results of MISI’s sootfall study with those conducted in Britain. Pittsburgh’s average annual soot fall (1,031 tons/sq. mile) was greater than that in Leeds (26-539 tons/sq. mile), London (248 tons/sq. mile, on average) or Glasgow (820 tons/sq. mile in the city center). They concluded: “either the methods of making calculations differ widely, or what appears to be the more plausible explanation – that Pittsburgh is a very smoky city.”

The bulletin reported the sources of smoke by section of the city. Smoke from Pittsburgh’s mills “inconvenience[ed] and affect[ed] every portion of the city whether business or residential. These mills, factories and plants... [were] so located that they form[ed] practically a chain about the entire city.” O’Connor and Straub pointed to the business section’s vulnerability to smoke from plants “within one or two blocks of being included in the area bounded by the business section.” Despite earlier experiments with the industrial use of natural gas, high-volatile bituminous coal was the “universal fuel” in these plants at the time of the MISI survey. The smokiest plants were nearest to the city’s center since they had the oldest equipment. In many cases their boilers were hand fired under poor working conditions.
O’Connor and Straub claimed that smoke abatement attempts in the district had met with little success because attempts to change boiler arrangements were not well coordinated or carried out based on correct knowledge of the interaction of smoke abatement technologies with one another. Even if good equipment were properly installed, it was often left to the care of untrained and poorly paid firemen. They recommended the replacement of antiquated equipment and the introduction of more central power stations and of automatic stoking in all plants over a certain size, and they blamed the situation on lack of intelligent engineering rather than on lack of political will.

O’Connor and Straub took on the giants of Pittsburgh, and the city’s most intractable smoke problem, when they turned to the matter of “special furnaces” – furnaces adapted to specific industrial processes and creating specific pollution problems. According to the report: “the most important of the special furnaces of the District, both regarding smoke production and number are the metallurgical furnaces.” It listed those furnaces emitting smoke: puddling furnaces (wrought iron manufacture), heating or reheating furnaces (those that heated iron and steel after forging or rolling and before finishing), hot air furnaces (those that melted iron or steel for making high quality castings) and soaking pits (in which steel ingots made by either Bessemer or Open Hearth processes were heated for finishing). Soaking pits used natural or manufactured gas and the other sorts of furnaces used bituminous coal.

O’Connor and Straub also listed metallurgical furnaces that made no smoke, but produced dust and fumes. Among these were the blast furnaces for pig iron manufacture which used coke as fuel, to be burned with iron ore and limestone flux. Blast furnaces
chiefly “inconvenience[d]” the “surrounding communities” by allowing ore and limestone dust to escape. The Jones and Laughlin red ore dust controversy involved such a furnace. Bessemer steel-making emitted “heavy fumes” “discharged at low levels.” While Open Hearth furnaces used natural or producer gas as fuel, they omitted yellowish fumes and dust from tall stacks high above the territory around them. A third sort of furnace producing dust and a small amount of fumes rather than smoke was the foundry cupola (used to melt pig iron for rough castings).

Several of the furnaces O’Connor and Straub regarded as problematic would not have produced black or dark gray smoke of the sort that current ordinances prohibited. Nonetheless, O’Connor and Straub saw them as an appropriate subject of MISI study. This work supported the development of an air pollution program that could go beyond the regulation of visible smoke. The report summed up Pittsburgh’s special problems with smoke abatement and metallurgical furnaces:

Until recently, all puddling and mill heating furnaces were exempt from the Pittsburgh Ordinance regulating the emission of smoke. During one stage of the puddling process, the conditions are unfavorable for smokeless operation, and this fact has always been the basis for the most formidable arguments against smoke abatement. Straub had examined this specific problem with the puddling process. The puddling furnace was usually hand fired with large pieces of bituminous coal. He broke the process of puddling down into four stages. During the first two of these stages, the melting of the iron and the removal of impurities, no smoke should be emitted. During the fourth stage, the formation of iron into balls, with appropriate care, smoke production could be avoided. It was during the third stage of the puddling process, that in which the furnace temperature was lowered and the furnace was filled with smoke to “bring ‘on to a boil of
the metal’’ that a small amount of smoke was unavoidably emitted. Metcalf and others had claimed that “an oxidizing atmosphere during this stage would be detrimental to the quality of the finished product.” The report claimed, however, that even for this stage of the puddling process, with “exercise of care on the part of the operator, and...application of some of the forms of stokers now on the market, the amount of smoke made should be appreciably decreased.” The number of puddling furnaces in Pittsburgh had declined considerably with the replacement of iron by steel, but by 1914, this trend had leveled off and O’Connor and Straub concluded that “the use of the puddling furnace has decreased about as much as it will for some time to come...the problem of eliminating smoke from this source should receive more study than it has in the past.” Like Searle before them, O’Connor and Straub were ready to attempt to regulate the furnaces Metcalf had used, in 1892, to justify Pittsburgh’s total exemption from smoke abatement.104 Unlike Searle, they were armed with the scientific prestige of Mellon Institute.

The report also discussed brick kilns and coke ovens, the subject (unbeknownst to O’Connor and Straub) of the dismissed 1849 smoke bill. As we have seen, smoke from a brick kiln had also been the source of the nuisance in Huckenstine’s case. O’Connor and Straub accepted the process of brick and terra cotta drying as essentially smoky but stated that smoke could be eliminated in later stages of the process. They recommended substitution of a fuel other than Pittsburgh coal or of “some method of precipitating the carbon and tarry products of the smoke” for the earlier stage of the process. Toleration of brick kiln smoke could no longer be claimed as essential to the city’s economic survival, as it had been in Huckenstine’s Appeal.105
O’Connor and Straub discussed the “considerable number” of coke ovens in the district – smoking constantly but with smoke that was usually “no denser than 60 per cent black.” They saw the elimination of smoke from coke ovens as a relatively easy task through secondary use of coke oven gas emissions to power other mill machinery. They also claimed that it was “probably only a question of time until these antiquated coke ovens will be replaced by by-product coke ovens, which, while certainly costly to install, are in the long run more profitable than the older forms, and which give no smoke.” The Mellon brothers would be centrally involved in the shift to by-product coking in the Pittsburgh region. Technological change would aid the cause of smoke abatement independently of any efforts on behalf of reform researchers like Straub and O’Connor.

Only after their extended discussion of metallurgical furnaces did O’Connor and Straub move on to the problems of locomotive smoke in the district. They saw locomotives as accounting for the highest proportion of actual damage from smoke because of the low level at which they discharged emissions. Yet, as we have seen, in most of their rhetoric in the bulletin they took stationary industry to be productive of most of the city’s smoke problem. Much of the problem of railroad smoke was smoke emission at the roundhouse, as articles from the 1906 Pittsburgh newspaper campaign had made clear when they called a North Side railway terminal “the real soot octopus.” Using coke in roundhouses was tried but rejected because it created a “poisonous atmosphere” for firemen there. Smoke consumption in locomotives was more difficult because of the restrictions on the size of combustion chambers, and, especially in Pittsburgh, because of the need for variable amounts of power for ascending and descending hills. The bulletin quoted the Chicago study of locomotive smoke which
concluded that “no patented smoke devices...applied to locomotives are successful in preventing smoke.” O’Connor and Straub suggested several modifications to the construction of fireboxes that could help. In Pittsburgh steep grades were often found next to public parks and residential neighborhoods and in some of these locomotives had already switched to coke.106

O’Connor and Straub contrasted the annoyance and damage produced by the relatively low-to-the-ground emissions of railroads and other mobile steam engines with the greater absolute smoke emissions of industrial stacks. They assigned the greatest responsibility, and gave the greatest attention to, industrial sources. In this way they made clear their criteria for ranking pollution problems.107 To O’Connor and Straub, the absolute volume of emissions was a more important target for amelioration than concentrated, but more isolated, pollution exposures. They emphasized repeatedly the importance of industrial smoke control. The bulletin concluded:

A small group of men control the plants which produce at least eighty per cent. of the smoke in the district. The solution of Pittsburgh’s smoke problem lies in inducing these men to apply the best of modern engineering practice to the combustion of fuel in their plants.108

Unlike the results from much of the rest of the investigation, the conclusions of the Engineering Phases section were unequivocal. Subsequent smoke regulation in Pittsburgh was to be based on these findings. In reality MISI results were reshaped and redeployed to limit the discomfort caused by new regulations.
Veditz and O’Connor took “publicity work” – arranging for publication of articles in Pittsburgh papers and national magazines – to be an important part of their job. MASI studies were well publicized in both the local and national press. Throughout 1912 investigators had reported preliminary findings of each of the bulletins to be released in 1913. A September 8, 1912 article in the Pittsburg Press reported on the inauguration of the 1912-1913 sootfall study. Benner reported the results of his work on the composition of soot and its effect on building materials in an article published in Pittsburgh’s Gazette Times on September 29, 1912 and on the same day, the same newspaper trumpeted “White Plague Not Induced By Smoke...Low Death Rate Is Found...Smoke Does Have Vital Effect in Pneumonic Cases, However, in City,” reporting on White’s talk to the International Congress of Hygiene and Demography. The Psychological Effects bulletin was written up in a column entitled “Smoke and Morals” in the Pittsburgh Bulletin in October 19, 1912. Such reports on the economic, architectural, psychological, botanical and meteorological effects of smoke continued through 1913 and 1914. Wallin’s and Benner’s work received the most newspaper coverage of all the MASI investigations during 1912, with O’Connor’s work frequently featured in the later years. MASI researchers also wrote up parts of their results for purposes of publicity and urged those who had aided in the research to do so, as in “Fighting Smoke In A Big Museum,” written for the Gazette-Times by the director of the Carnegie Museum after O’Connor’s inquiries into the cost of smoke damage there.
publicity campaign emphasized the economic costs of damage due to smoke and hedged bets in discussion of health effects.

A Pittsburgh Sun editorial argued that despite the ambiguity of MISI results on health, strong economic arguments were available for smoke abatement. O’Connor wrote an approving letter to the editor. He took the opportunity to affirm that smoke did indeed have “very serious” “indirect” effects on health, if not the expected ones on tuberculosis, and referred interested readers to relevant British studies. Yet, he agreed with the editorial that: “those who favor smoke abatement do not need the bugaboo of health to bolster up their case. The fact that Pittsburgh is taxed $10, 000,000 a year because of the smoke nuisance is sufficient argument.”

Attention from the national press kept pace with local coverage. In 1912 and 1913 Benner and O’Connor published articles summarizing ongoing research and preliminary results in Industrial World, Metallurgical and Chemical Engineering, Scientific American Supplement, American Architect, Coal Age, Iron Age, the Journal of Industrial Engineering Chemistry, and Coal and Coke Operator. National coverage of MISI would not be confined to the industrial press; O’Connor would publish pieces in 1914 through 1917 in Popular Science Monthly, the National Municipal Review, and American City. The Survey published an essay review of the bulletins by an author its staff had recruited in March 1915 and the National Municipal Review did the same in September 1917.

MISI investigators thought carefully about how to use the results of their research to influence action against smoke. Magazine and newspaper articles were one vehicle for such influence. The formation and direction of a new local smoke abatement society, agitation for the passage of smoke ordinances, oversight and the administration of the
smoke inspector’s office were others. The initial outline of the smoke investigation submitted to R. B. Mellon on February 19, 1911 included as its last element, an “educational campaign.” Benner hoped “to interest a sufficient number of influential citizens of Pittsburgh, that the necessary steps may be taken whereby the requisite power for enforcement may be gained for the elimination of the nuisance along the lines indicated by our investigators.” O’Connor, in an undated draft of an article for Saturday Critic, likely from March 1912, projected that after publication of the reports of the investigations “a campaign [would be] started to carry out the recommendations made by the various members of the staff.” A plan for subsequent years of the investigation submitted to Mellon in May 1912, projected for 1914-1915, “work....mainly of an educational nature” to be “carried on by men on the University staff, through a Smoke Abatement League which is to be organized.”

Work on the new organization began less than a year after the investigation had gotten underway. In June 1912, Benner had made arrangements to meet with W. H. Stevenson, 1909 mayoral candidate, former supporter of the Tilbury bill and Chamber of Commerce president, in order arrange a meeting with the chamber’s Smoke Abatement Committee on “some kind of a cooperation between the Chamber of Commerce and the R.B. Mellon Fellowship of the Department of Industrial Research.” By September, 1912, MISI investigators had managed to sell the idea of such a league to the chairman of the Chamber of Commerce Committee on Smoke Abatement, William T. Todd who agreed to “call a conference....[of] all Civic Organizations” in order to organize such a league. Todd asked MISI “to draw up a scheme of organization which he proposed to ‘railroad’ through at this meeting.” By November 2, Todd had promised to bring a
resolution proposing an organizing conference for such a league before the chamber’s Board of Directors.122

The next day, O’Connor submitted a list of organizations to be included. The chamber, however, was inclined to call only “commercial organizations” and the Engineers’ Society and to omit women’s clubs. Stevenson warned Benner that women should be excluded from the league and advised to form their own organization.123 MISI staff, perhaps because of their deep connections to the social work and social survey community in which women were prominent, or because of their knowledge of the importance of women’s efforts in other cities and in previous Pittsburgh campaigns, found this unacceptable. The following Monday (November 7), the chamber’s Board of Directors passed a resolution calling for the conference, with the understanding that “women’s clubs [would] not be represented.”124 O’Connor was already, in early and mid November, meeting with leaders of local women’s organizations and urging them to establish smoke abatement committees within their groups of the sort that would be needed to be a part of the smoke abatement league.125 By the end of November, O’Connor and Benner asserted MISI’s power over the formation of the new organization on this issue – though it required five meetings with Stevenson and Todd to impose their will. By November 25, they had convinced Stevenson, who must have overruled Todd, to agree to allow the Civic Club and the Federation of Women’s Clubs to participate in the conference and to be full institutional members of the new organization.126 Civic Club activist H. Marie Dermitt would even become one of the organization’s two vice presidents in its first year.127
The League was to function as a tool to implement the conclusions of the investigation.128 O’Connor appended a complete draft constitution for the organization, to be called the Smoke and Dust Abatement League, to a November 4, 1912 report on his work.129 MISI staff were careful to manage the impression made on the members of SDAL of the Investigation’s interests, and to hide the importance of the organization as an MISI tool. They made sure that the keynote speech for the initial meeting would be given by a selected ally “outside of the Investigation.” Although they would secure O.P. Hood of the United States Bureau of Mines130 to give the address on December 9, O’Connor also included a draft of a such a speech in his November 4 report. Nonetheless, MISI staff were not shy about securing help from such selected allies. They enlisted Stevenson’s aid to be sure that the first meeting and the officers’ elections would be so conducted that MISI would have control of the secretarial position.131

It is of the utmost importance that we have the secretarship of the organization. This I think will fall to us if Mr. Stevenson is consulted and one or two other man [sic] selected when the nomination is called for. Of course, the man who presides at the meeting will have to know of this move, otherwise someone else may get his eye. This, too, could be arranged through Mr. Stevenson.132

O’Connor would also ask Stevenson in April to offer the treasurership (for which O’Connor would later prepare the annual report) to R. B. Mellon.133

O’Connor was explicit about the league’s limited value and its dependence on the investigation:

From experience in this city I should say that such an organization will do no real work. It however, can be made to be of valuable aid to the present Investigation through the use of its influence. The only question that seems of importance to me is the power of giving it direction....After the organization is started, those who are willing to do work will control and I think that they will be the people connected with the present investigation....I do not for a moment wish to place small importance on such a Conference. It can be made to be of the greatest
importance, but that will be not of itself but of the use that is made of it by the present Investigation. Without the help of the present Investigation I judge that the organization would be stillborn. We should make sure that we are in control of the organization and then at some future time change it so as to suit plans. 134

On November 11, 1912 the Pittsburgh Gazette Times ran an unsigned article calling for the formation of a smoke abatement society.135 The article was in fact submitted to the paper by a member of the investigation, probably John O’Connor, since a draft exists in MISI archives.

Less than a month after the MISI-authored newspaper article calling for its existence appeared, the Gazette Times reported that such an organization had indeed been formed for Pittsburgh: “League Formed to Fight Smoke Evil – Civic Bodies Unite to Battle for Abatement of Smoke and Dust.” The Smoke and Dust Abatement League formed at a meeting of the Chamber of Commerce on December 9, 1912, in accordance with the Chamber’s resolution to form such a body at its November 18, 1912 meeting.136 The group served as an umbrella organization for interested parties from the University of Pittsburgh, the Engineering Society of Western Pennsylvania, the City Planning Commission, the Civic Club of Allegheny County, the Chamber of Commerce and a number of other Pittsburgh organizations.137 Membership was also open to individuals. Since the League had such a wide membership, yet would meet only once a year, it allowed every group or individual prominent in Pittsburgh’s civic life to appear to be doing something about smoke. As O’Connor’s November 4 report had predicted, the work would fall to those willing to do it, and O’Connor’s own bet was that these would be those closely associated with MISI or at least those who most clearly shared its aims.138
MISI planners and their allies set the new league the task of developing a smoke abatement exhibit to be part of the Western Pennsylvania Exposition, held from August to October of 1914, to make clear how and why true smoke abatement was to be accomplished. The Exposition would be widely reported in Pittsburgh’s newspapers and would have 12,000 visitors. Many newspaper articles mentioned the smoke abatement exhibit. The pamphlet for the exhibit included illustrations for the results of a number of MISI bulletins: a sootfall map of the city; a graphic showing a test-tube containing the “Volume of Soot Equivalent to 10.6 grams Found in Lungs of a Pittsburgh Peddler 28 Years Old” next to a “Photomicrograph Section of Human Lung Showing Excessive Carbon”; a United States Weather Bureau pie charts showing percentages of possible sunlight received by various cities, with Pittsburgh receiving the least; pictures showing the condition of plants at measuring stations subjected to varying degrees of sootfall; a drawing of a block of coal showing how much was wasted in incomplete combustion; and a list of the costs of damage due to smoke arranged in the form of a bill with the caption “The Cost of Smoke – You Foot the Bill.” The first page of the pamphlet featured a picture of two obelisks, one, the Washington Monument, was dwarfed by the other, representing Pittsburgh’s annual sootfall. Thus the league’s first job had been to publicize the wide range of MISI results.

O’Connor attempted to enlist allies gathered together in the new organization in smoke abatement enforcement. His plan of attack had several components: (1) enforcement of Pittsburgh’s existing smoke ordinance, passed in 1911 after the state enabling act (discussed in the preceding chapter) (2) passage of a new smoke ordinance that would include mill puddling and heating furnaces (3) installation of a new smoke
inspector under the new ordinance. In these efforts, O’Connor would confront the political limits of the power of reform research experts.

Near the start of the investigation in October 1911, Benner had attempted to have himself appointed assistant smoke inspector but J. M. Searle, the chief city smoke inspector had resisted this effort.¹⁴² Yet between that time and late June 1912, MISI staff had worked cooperatively with Searle. At that point, investigation engineer W. W. Strong reported on “quite a conference...on the smoke situation in the city” that he had held with Searle. Strong was grudgingly willing to give Searle the benefit of the doubt for the time being: “Apparently the smoke inspecting department is doing some work as over a hundred installations are often reported per month.”¹⁴³ In September 1912, Searle helped O’Connor to gather materials for his piece on the history of smoke abatement in Pittsburgh and mentioned to O’Connor the idea of inviting the International Association for the Prevention of Smoke to meet in Pittsburgh in 1913.¹⁴⁴ In January 1913 O’Connor and Joseph Beck, instructor of Economics at the University of Pittsburgh and smoke investigation legal expert, called on Searle “to discuss the constitutionality” of a new smoke ordinance then before council. Searle “said he was paying no attention to that phase of the ordinance nor did he wish anyone to interfere with it in any way.”¹⁴⁵

In spring 1913 Searle urged that Pittsburgh’s already great smoke abatement progress could be extended under an amended ordinance. In a newspaper article from April 6, 1913 Searle asserted that the city had seen “a wonderful clearing of the atmosphere in recent months.” He predicted a 90% smoke reduction from the level of four years ago if the city’s ordinance were amended to his suggestions. He claimed impressive results with specific polluters: Jones and Laughlin was “absolutely without
smoke emission”; Union Station’s stack was clear; the Frick building was using good stokers; Crucible Steel had clear stacks. The Pennsylvania Railroad had been working hard and well at smoke reduction since 1905. The old iron and steel works were being taken over and remodeled by new companies and made smokeless in the process. H.J. Heinz was installing new smokeless boilers. Searle thanked cooperative manufacturers. Yet he wanted the regulations amended to cover Ringlemann #2 smoke (40% black) in addition to #3 and #4 already covered. The headline of the article featured Searle’s prediction that if the ordinance were so amended Pittsburgh would be “Almost Free From Smoke In One Year.”

O’Connor still relied on Searle in April 1913 for helpful information – like the coal consumption statistics he needed for MISI reports. Yet during the same month, O’Connor criticized Searle’s policy, which he characterized as one of persuasion and non-prosecution, in a talk he gave to the Twentieth Century Club. Benner reported that smoke investigation staff had been meeting with members of the Civic Commission and developing an independent plan to have the ordinance better enforced.

Several conferences have been held...in regard to the prosecutions which we are planning to bring against violators of the Pittsburgh smoke ordinance. A plan of action has been devised which seems satisfactory to all concerned. Final action will be taken on this by Professor Duncan after which it will be submitted to the Civic Commission.

Neither the archival material nor the newspapers make clear what this plan was, but in general, dealings requiring powerful political intervention were left to Robert Kennedy Duncan or to R. B. Mellon, often through the mediation of his assistant, a Mr. Hicks. There is no further evidence for the execution of the plan for independent prosecutions. Yet, in Summer 1913 the smoke inspectors’ office did face a major shake
up. Perhaps this was engineered or influenced by Duncan and/or Mellon. The New York City Bureau of Municipal Research, which had been hired by the Pittsburgh City Council to evaluate various city bureaus, issued its report. The New York report claimed that Pittsburgh’s Public Health Department Division of Smoke Inspection used a “large staff” to “obtain information that is ineffectively used” and that “the avowed policy of ‘no prosecution’ removes the sting of inspection.” Departmental reports showed two prosecutions in the first half of 1913 and none for 1912. The report also complained that there were no permanent records of citizen complaints. The investigators claimed that the current ordinance “if properly enforced” would “control the smoke nuisance,” “that no complete and available files are kept, although the basis of prosecution is frequently a citizen’s charges,” “that claims of smoke abatement must be discounted because it is not shown by the records that the abatement resulted from the department’s activities.” The report suggested that violations of the ordinance, which prohibited more than eight minutes of dense smoke emission per hour, were so abundant that it was not necessary for inspectors to sit and stare at individual stacks for an hour at a time to locate them. It complained of hour-long observations intended to amass evidence that would not even be used in legal proceedings. By contrast, the report noted New York City’s own record of 2,332 arrests, 2,066 convictions, and $5,394 in fines for smoke abatement violations between April 1906 and April 1911.

Searle challenged the report’s claims in the city newspapers. He asserted that one needed only to look at the reduction in cloudy days between 1908 and 1912 to see that there had been progress. Searle’s approach, however, had been one of cooperation rather than prosecution and of disproportionate emphasis on a relatively safe target – the
railroads. Emphasis on railroads ran contrary to MISI results, already complete by June
1913, that, in Pittsburgh, railroads were the second most important source after
manufacturing establishments. In the meantime (June 1913) Strong’s reports were
increasingly critical of Searle: “Mr. Searle was again interviewed. The Iriquois [sic] has
been smoking badly at times, but it seems that steps are being made to clear up this
matter.”

Just after the Bureau delivered its report, Searle had to host smoke inspectors
from at least two continents in Pittsburgh. The decision of the International Association
on Smoke Prevention, the smoke inspectors’ professional organization, to hold its eighth
annual convention in Pittsburgh in September 1913 would seem to be a testament to
Searle’s success. Pittsburgh would be the first American city to host such a meeting. In
addition, Searle was elected president of the Association at the meetings. Yet, a
newspaper article on the conference, which included various boat and automobile tours
of Pittsburgh, concluded with the following quotation from a Glasgow delegate, William
B. Smith:

It is a great misfortune to the people here that such a beautiful city, with such
elegant buildings should permit great volumes of smoke to hover over it. With
proper installation and proper mechanical devices 90 per cent of your smoke
could be eliminated. It seems to me that your engineers have been too much
occupied in getting large outputs and making money in the quickest way. Your
coal around here is so cheap that I anticipate it is not necessary for your (sic) to be
thriftily with your coal consumption. A great part of the coal could be saved by the
use of proper methods, which would incidentally abate the smoke nuisance. Your
wealth of natural resources is enormous, but you use them too extravagantly.

Pittsburgh’s success was not universally accepted, despite Searle’s claims and the
recognition he received. O’Connor and his allies would have agreed with Smith – much
improvement was still needed.
By November 1913, in spite of Searle’s presidential honor and against the background of the New York Bureau’s critique, O’Connor approached a sympathetic council member (Mr. Robert Garland) about the matter of a new ordinance and a new smoke inspector.\textsuperscript{157} O’Connor would meet with resistance to the implementation of the MISI program from those who should have been his allies: Chamber of Commerce members affiliated with the SDAL, his benefactor Richard B. Mellon, and the politicians from whom Mellon had promised O’Connor help. Resistance to MISI goals would unfold slowly and subtly over the next few months and would be intermingled with abortive experiences of real power and progress.

Soon after approaching Garland, O’Connor tried to get Chamber of Commerce members to appoint a committee from the SDAL to look at the city ordinance and its administration. Surprisingly, they refused and were particularly unwilling to suggest new candidates for the smoke inspectorship.\textsuperscript{158} The archival materials contain various indications of investigators’ particular displeasure with SDAL President Todd’s uncooperativeness. By late November 1913, Civic Club ally H. Marie Dermitt, eager that any new ordinance specify the “proper type of inspector,” “intimated that the Civic Club would withdraw from the League unless a president other than Mr. Todd were elected at the coming SDAL meeting on November 25.”\textsuperscript{159} As early as 1899, women activists had found the Chamber insufficiently energetic in its actions against smoke. As we have seen, Todd and his colleagues had no wish to work with the women again in the SDAL. Within days, Dermitt would be granted her wish in a new SDAL president, Carnegie Institute of Technology Dean Arthur A. Hammerschlag.\textsuperscript{160} At its second annual meeting, on November 25, 1913, the SDAL resolved to look into modification of the present smoke
ordinance and its enforcement, in response to the previous year’s criticisms. O’Connor and his small group of like-minded SDAL allies were ready to take new and decisive action by putting in place a smoke inspector willing to act on what had been learned in MISI’s investigations.

This alarmed an anonymous editorialist, who wrote in the Pittsburgh Sun on the day of the meeting, cautioning the League. The writer understood the SDAL as an extension of earlier Chamber of Commerce, Twentieth Century Club and Civic Club efforts – as was evident in his or her reference to the organization’s “eighteenth annual meeting” held that day. The editorial criticized plans “for carrying on the work [of smoke abatement] more energetically.”

Abatement of nuisances is always in order, and this league has done much to make Pittsburgh a better place in which to live. Continuance in that course is commendable, but a word of caution is timely. Extreme measures should not be resorted to. The city must be benefitted and not injured. During the eighteen years the league has been in existence its activities have been governed with moderation and wisdom. Extremists have urged it to greater energy in enforcement of ordinances, but it has taken wise council and applied itself to the work of education and encouragement. That way lies the future of usefulness.

The editorial went on to claim that “Pittsburgh was no longer the ‘smoky city’ of America.” Though the writer admitted that the city was “not quite as clean as some where industry is not the chief distinction,” he or she “approved of the “gradual – and that means economical – change from smoky firing to automatic stokers and smokeless devices generally.” The writer predicted that voluntary and gradual industrial improvement would continue until “there is no more smoke than necessary.” The piece highlighted ignorance of the means of abating dust and encouraged any who would attempt this to “go slow” and undertake protracted investigation. Publication of this
editorial is evidence of the high level of industrial comfort with the previous efforts of Pittsburgh’s long-standing smoke abatement campaigns. It also suggests that the new efforts of the SDAL to reform the smoke inspector’s office, urge prosecution of violators and perhaps even address dust complaints, were finally substantive enough to threaten polluting industries.

Searle was set to defend himself in council on November 29, and Mellon Institute staffers waited for two afternoons in council chambers to hear him speak. Searle was not called upon, however. O’Connor reported happily that to make up for lost time he had “called at the office of the Civil Service Commission and found that the office of smoke inspector was exempt from examination at the time of Mr. Searle’s appointment [and so]... Mr. Armstrong [mayor] [was] free to make a new appointment.” During December Duncan worked closely with O’Connor and Beck to influence council “to put Smoke Abatement work in Pittsburgh on a new footing.” On December 16, O’Connor and Beck worked to draw up possible ordinances as requested by Duncan. Duncan gave one of them to Robert Garland who introduced it into council, where it had a first reading and was sent to the Committee on Public Health. It required that the chief smoke inspector have an engineering degree and Searle did not meet this requirement. On December 20 a newly formed SDAL committee, including president Hammerschlag, and United States Bureau of Mines engineer Samuel B. Flagg met with with Beck met to discuss the new ordinance. They would convene a number of weekend meetings in December and January. The December ordinance was soon passed by council, but was vetoed by the mayor. In January 1914 the controversy over smoke inspector
qualifications was ongoing. William Addison Magee, in his last act as mayor, again vetoed an ordinance that required the smoke inspector to have an engineering degree.\textsuperscript{169}

By January 10, O’Connor would be relying on Mellon for political advice, trying to reach him though his assistant Mr. Hicks. O’Connor talked to Hicks about having Garland introduce another ordinance drawn up by the SDAL committee. In the meantime, O’Connor was looking for advice on who a better qualified inspector would be. He approached mechanical engineer and smoke investigation staffer, A. B. Bellows (also affiliated with the Pittsburgh Testing Laboratory), who recommended asking someone from the Bureau of Mines. Flagg, already on the SDAL ordinance committee, seemed to be the only qualified prospect, but he initially declined.\textsuperscript{170} On Sunday January 12, 1914 the SDAL’s special committee met again. Garland had agreed to introduce the ordinance they had developed, on the following Tuesday. The committee had a hearing on the bill on the following Wednesday. At the hearing the Pittsburgh city council heard advice from members of the Engineers’ Society, faculty of the University of Pittsburgh and Carnegie Technical Schools, and spokespeople from the Smoke and Dust Abatement League on the subject of smoke inspector qualifications. Searle spoke on his own behalf at this meeting – of his background as a blacksmith, a machinist, a patternmaker and an engineer. He defended his record as smoke inspector – presumably against charges that improvement in the smoke situation had not been great enough during his tenure – saying that coal consumption in Pittsburgh had risen by 73\% in the previous five years.\textsuperscript{171} O’Connor characterized the hearing as “most successful from our point of view, as the ordinance was affirmatively recommended and sent to the city solicitor for improvement
in form.” They did not understand what “improvement” – in the long run and at several hands – might mean.

The SDAL committee met again on the following Saturday afternoon. Garland told O’Connor on Tuesday that the city solicitor had changed the name of the ordinance so that it would have to be reintroduced. The Stationary Engineers (the labor organization representing boiler and power plant engineers) wanted a hearing on the ordinance on Wednesday and O’Connor arranged for Flagg and Beck to be there. The SDAL committee met again on Friday to discuss the changes that had been made by the city solicitor. The ordinance would be reintroduced by Garland, under its new name, on January 27. O’Connor continued to seek advice about the smoke inspector appointment. Much to the chagrin of O’Connor and the committee, Garland made further changes to the ordinance, not authorized by SDAL members or smoke investigation experts, before he introduced it on January 27. O’Connor was extremely disappointed, seeing the modified ordinance as “Very unsatisfactory, but...we suppose the best that could be secured at the present time.” The ordinance was to be voted on February 3. O’Connor called Hicks to find out what Mellon thought about the smoke ordinance and inspectorship but didn’t get any definite information.

The Engineers’ Society of Western Pennsylvania and the Bureau of Mines were scheduled to meet on the day of the vote to discuss all the candidates for the smoke inspectorship who had been put forward so far. These included Samuel B. Flagg Engineer, United States Bureau of Mines (member of the SDAL committee on the ordinance); MI investigator Albert A. Straub, Efficiency Engineer, Duquesne Light Company (Straub repeatedly requested meetings with O’Connor, presumably to discuss
the inspectorship and O’Connor does not seem to have been taken with his candidacy.); Harvey Allen, Development Engineer, Pressed Steel Car Company; and John C. Sproull, Assistant Professor of Mechanical Engineering, Carnegie Institute of Technology.

O’Connor met with public health director Edwards about the nominees. Edwards preferred Flagg and wanted to offer the position to him, but Hicks reported that Flagg could no longer be considered because he lived outside city limits. Hicks preferred Sproull “whom he asked us to bring in to see Mr. Mellon,” but Sproull was in Detroit for a week.176 O’Connor confirmed Flagg’s eligibility with the city solicitor, contrary to Hicks’ claims, but Flagg too was out of town.177 O’Connor corresponded irritably with Flagg, after having held the position open for him. Flagg replied that most likely he would decline.178 Nonetheless, when Flagg returned, he was taken to lunch with O’Connor and Mellon and (only after this), Edwards formally offered him the position. Flagg wanted to evaluate the level of governmental support he would have for enforcing the ordinance and so requested a meeting with the mayor (newly inaugurated Joseph G. Armstrong) and Garland “so that he might ascertain their attitude on ‘Smoke Inspection.’” Perhaps this level of commitment to real enforcement angered Mellon, or perhaps it was Flagg’s foot-dragging followed by what may have been perceived as ingratitude that strengthened Mellon’s resolve against him. On Wednesday morning – after meeting with O’Connor, Garland said he would talk with the mayor, Edwards and Mellon about Flagg. But, he added that there “might be some trouble because Mr. Flagg lived outside the city limits” – contrary to the legal clarification O’Connor had already secured. O’Connor’s hopes were again frustrated by Garland’s political wheeling and dealing. He reported “We met Mr. Garland again on Saturday evening. He said that they
had decided to appoint Mr. J. W. Henderson of the firm of ‘Gulick and Henderson,’ Consulting Engineers, to be ‘Smoke Inspector’. He said that Mr. Searle would be retained as first assistant.” Searle attempted to use a legal loophole to hold onto his position, delaying the appointment of Henderson for five days. Henderson was officially appointed on March 2, 1914. A week later O’Connor wrote to Henderson, “to congratulate him and to offer our co-operation.” He visited the new smoke inspector later that day.

According to *Industrial World* (published in Pittsburgh) Henderson was a man of “large affairs” whose services Pittsburgh was to be “congratulated on securing.” He was a chemist and metallurgist who had worked primarily for companies that made steel railroad cars (including Mellons’ Standard Steel Car Company) in Chicago, Baltimore and then Pittsburgh. He had later taken a position in Buffalo with a foundry before returning to Pittsburgh to found Gulick-Henderson, “chemists and inspecting engineers.” Henderson obviously had a great deal of experience with heavy industry. He had been a member of the Engineer’s Society of Western Pennsylvania for over ten years.

*Industrial World* was equally enthusiastic about Henderson’s appointment and about the retention of Searle. Searle’s retention seems to have been at least as large an issue as who would fill the chief inspectorship. The Pittsburgh branch of the National Association of Stationary Engineers had explicitly endorsed Searle for the position of assistant smoke inspector, but *Industrial World* mentioned no such endorsement of Henderson. Perhaps willingness to work with Searle was the major factor in Mellon, Garland and Walter’s decision to appoint Henderson rather than Flagg.
The new ordinance went into effect in March 1914. The Pittsburgh Sun printed a cartoon on March 13, picturing a somewhat bewildered, benign-looking, colonial old man, “Pa Pitt” smoking his “chimney pipe.” A blue-stocking, the University Commission, shook her finger at him gently saying “You have too much smoke.” Pa Pitt responded “Now, Don’t Lecture Please. You know I’ve reformed a lot!” The cartoon was captioned: “He Thinks He Deserves Some Praise.”185 Many Pittsburghers, like Pa Pitt, wanted to hold to Searle’s view, that the city deserved some credit for good progress made to date.

Henderson’s initial focus, like Searle’s, would be on the railroads. Yet, this campaign was to be carried on with greater vigor. By April 27 the new smoke inspector, at the direction of city council, had given notice to the railroads that they were required to obey the city smoke prevention ordinance and abate smoke within three months. Henderson reported promises of compliance from most of the railroads in the city. Industrial World claimed that Pittsburgh railroads were already working toward smoke abatement according to agreements they had reached with former smoke inspector Searle in November 1912.186 Yet, the Pennsylvania Railroad objected that it could not obey the ordinance without excessive expense. Henderson promoted smokeless fuel as used in other cities to the railroads and the education of firemen for smoke abatement.187 At the third meeting of the Smoke and Dust Abatement League on October 22, 1914, members discussed railroad smoke and domestic smoke but not industrial smoke.188 When several articles promoting by-product coking appeared in Pittsburgh newspapers on November 10 and 11, 1914, they mentioned the special usefulness of coke in eliminating railroad smoke.189
Late in 1914, Henderson, like Searle, began to make claims of progress to Pittsburgh’s Smoke and Dust Abatement League. Henderson claimed that Pittsburgh’s air was significantly cleaner since the new anti-smoke ordinance had gone into effect in the spring of 1914. In December several newspaper articles made the same claim. The smoke inspector’s office held a “smoke abatement ‘experience’ meeting” at Chamber of Commerce rooms with representatives of 75 “manufacturing and railroad companies doing business in Pittsburgh.” Several, mostly railroads, told how they had made smoke abatement progress and how much they had spent. They “declared that the city smoke ordinances are fair.” According to Chief Henderson 2/3 of stationary stacks now had smoke abatement equipment. He claimed, “Pittsburgh was less smoky last summer than for many years.” Henderson wanted to establish a joint committee of railroad and manufacturing executives to confer with the smoke abatement division. He reminded his listeners of coming prosecutions and fines: set at a maximum of one hundred dollars per case.

The Smoke and Dust Abatement League at this time (December 1914) urged Henderson to enforce the ordinance stringently, and its yearly report recommended that after January 1, 1915 suits should be filed against “all persistent offenders in the last 2 years” and after April 1, 1915 against those who violated the ordinance 4 times in one month. The League’s recommendation was: “that the bureau continue its plan of cooperation with only such companies and railroads as show a spirit and willingness to make improvement and take steps to adopt the same within a reasonable time.” The League was also eager to work to eliminate smoke in boroughs near the city. Henderson agreed to the League’s demands and said he would send out letters notifying offenders of
the new policy as of January 1, 1915, but he also emphasized the progress in smoke abatement already made. Henderson retaliated against his critics a week later at a meeting of the Pittsburgh Chamber of Commerce by accusing the Smoke Abatement Committee of the Chamber of laxity. In July 1915, Henderson sent letters to violators that included copies of Smoke and Dust Abatement League and Chamber of Commerce resolutions demanding that the bureau initiate prosecutions. Henderson represented himself in his 1915 smoke abatement handbook as unable to resist this public pressure to prosecute. He warned that once court action was initiated there was no turning back.

By late 1915 Pittsburgh was a widely proclaimed smoke abatement success. Henderson used United States Weather Bureau records to show that for the first 9 months of 1915 Pittsburgh had only 100 smoky days (81 light, 19 dense). For the same period of 1913 it had had 234 and 156 smoky days (32 dense) in the first nine months of 1914. Henderson pointed out that in 1914, however, many industries had been idle which were in operation in 1915. He gave credit to his own office and to the present ordinance, which had become effective July 1914. According to the article, Pittsburgh was now looked upon by others as a smoke abatement success and had hopes of becoming a “smokeless city.” The article claimed that a woman visitor, who had not traveled to Pittsburgh for several years, had been amazed at its cleanliness on a recent visit.

Henderson praised the cooperation of coal users in an address sponsored by the Chamber of Commerce to 150 representatives of Pittsburgh businesses. He and his assistants asked manufacturers what they were doing for smoke abatement, discussed their complaints and exhibited smoke abatement devices. Representatives from the Smoke and Dust Abatement League, the Civic Club and MISI also attended the
At the same meeting, however, Henderson read a letter from the Civic Club to his office, which urged prosecution of violators. He announced that prosecutions would begin after January 1, 1916 and read a list of 319 violators including the city’s Brilliant Pumping Station, the city garbage furnace, and the River Ave. Pumping Station. He also cited problems outside city limits (McKees Rocks). Yet Henderson also extolled various successes: Jones and Laughlin had put in stokers, a dye works was going from coal to gas, the Pennsylvania Railroad was installing new devices and other railroads were attempting smoke abatement as well.

Henderson told the same gathering that the promotional slogan then under consideration by the Chamber of Commerce, “Prosperity Promotes Pittsburgh,” connoted “Smoke Promotes Pittsburgh” and should be replaced by “Prosperity Promotes Progress.” He celebrated the 50% drop in smoky days since 1912 and urged that Pittsburgh could be smokeless and prosperous. He showed pictures of the Crucible Steel plant before and after smoke abatement equipment was installed in 1912 and claimed that Crucible Steel had saved 60 thousand dollars per year on fuel after installing 130 thousand dollars in smoke abatement equipment (1913 report). He also showed a picture of a Jones and Laughlin plant in which the smoke in the photo actually meant not prosperity but hard times: Jones and Laughlin at the time could not afford to start up their blast furnace so had no gas from it to power other operations and had to use coal.

In September 1915 Smoke Regulation Bureau assistant W.E. Porter told the International Association for the Prevention of Smoke, meeting in Cincinnati, that Pittsburgh was “healthy, clean, green” with “no smoke fog” and that his bureau had good cooperation with businessmen and manufacturers. He spoke of the hyperbole recently
indulged in by calling Pittsburgh the “smokeless city” and said that most Pittsburhgers
did not take “smokeless” literally. Yet he said that the phrase “Smoky City” was now
“historic rather than descriptive” and gave “Pittsburgh a black eye by advertising
disadvantages that no longer exist.” According to Porter, “among great industrial cities of
the world none today has less smoke than Pittsburgh.” Porter compared the smoke evil to
a giant, a “grimy hulk [that] was an obstacle to every dream of esthetic progress” and saw
Pittsburgh as a “David” who had battled the giant (through cooperation with railroads
and manufacturers) and won. He claimed that Davids could “indulge in [the] mild
hyperbole” of calling Pittsburgh the “smokeless city.”

Despite such claims of success, an editorial published in the Pittsburgh Sun on
January 12, 1916 criticized efforts to enforce smoke ordinances in “many cities” which
had “prided themselves on what they have accomplished.” The editorial complained that
“to the private individual who had to inhale the heavily laden atmosphere and who has
watched the smokestacks belching forth their dense clouds the accomplishments are
academic and not practical.” The paper complained that smoke abatement officials
“pinned down to a statement of accomplishments...have taken refuge behind the
inadequacy of laws and ordinances” and the paper saw this as somewhat justified because
“they have not been given the support their work and their own enthusiasm merited.” The
purpose of the editorial was to point out a decision of the United States Supreme court in
a case of an Iowa laundryman accused of violating a local smoke ordinance, which
reaffirmed the right of cities to regulate smoke. The paper hoped smoke abatement forces
would take courage from this decision and blamed the cheap cost of fuel, a special
problem in Pittsburgh, for smoke-makers’ lack of interest in fuel conservation as a factor
impelling smoke abatement. Henderson actually reproduced a clipping from Power describing this court decision on the back cover of the Bureau’s 1915 handbook (published in early 1916).

Over the next two years, the smoke inspection bureau became more and more committed to a policy of prosecuting violators. Still the smoke inspector’s office seemed to be delaying legal action. In September 1916, smoke inspector Henderson sent out a third notice to all who had not installed smoke abatement devices warning of prosecution. A planned smoke abatement week in October sponsored by the Chamber of Commerce and the Allegheny County Civic Club would be “the time selected to announce when violators may expect arrest.” The article went on to complain briefly about river steamboats, identified by MISI as a minor source of smoke, as “a tough problem for the smoke division.” Again, a source other than industrial plants was highlighted.

Numerous articles described the planned Smoke Abatement Week to come in October. The Chamber of Commerce’s commitment to the enterprise was so strong that it offered to match the funds donated to the undertaking given by all other civic organizations combined. Newspapers repeatedly pointed to cheapness of Pittsburgh coal as a major impediment to local smoke abatement efforts.

Henderson stood on the success of his work with railroads and on the declining number of smoky days per year reported by the United States Weather Bureau to point to smoke abatement success in Pittsburgh. He had motion pictures made of local railroad smoke abatement practices for distribution to cities around the United States so that they could learn from Pittsburgh’s example. He argued that “the same can be done in industrial plants” as had been done with railroads. Henderson continued to receive
accolades from other cities for the work he had done in Pittsburgh. Thomas R. Marshall,\textsuperscript{207} president of the Masonic convention, “praised Pittsburg for her progress in abating the smoke nuisance.” Marshall said:

Your smoke is disappearing, and yet you maintain your industrial supremacy....I came to Pittsburg a little over a year ago and believed until some one informed me otherwise that a thick blanket of fog had settled over the city. I came here today and took in Pittsburg quite thoroughly and find your streets and tall buildings illuminated with the full strength of the sun’s rays. You Pittsburg people are certainly entitled to much credit for your accomplishments in abating the smoke nuisance. People of other cities can no longer tease you about coming from a city of dirt and smoke.”\textsuperscript{208}

Efforts against Pittsburgh’s smoky mills finally got under way in September 1916. Chief Henderson planned to file suits against several mills each day that smoke violations were not stopped and to impose fines for each separate offense. Crucible Steel, praised by Henderson for its compliance in 1912-13, was a major target in 1916. According to the Pittsburgh Telegraph “Vice President John Sutton of the Crucible Steel Co....said that the Crucible Steel is probably spending more money for smoke abatement purposes than any other company in the city and has spent so far nearly half a million dollars toward stopping the great amount of smoke in the Pittsburgh district.” Crucible’s Singer mill on Carson Street was called the “worst offender.” Sutton was quoted as saying “Probably it is, but it is an old mill and we did not feel that a great expenditure in equipment was warranted on the mill as it is likely to be moved at any time.” Even in this mill however, Crucible claimed to have put in a “a new battery of modern boilers to supplant the old” but the work was interrupted by the widening of West Carson Street. This forced the project to be abandoned, a new mill site to be sought and a new boiler house and machine house built there. Crucible also claimed to be improving smoke
abatement at its Crescent Mill site but the improvements had not been completed within the thirty day period specified by Henderson. Sutton planned no more improvements to Crucible plants until the two mentioned were accomplished. Henderson also planned to prosecute Rogers Sand Company and Iron City Sand Company. The inspector claimed that violators had two months before prosecutions would begin. Even this further postponement did not satisfy some manufacturers. Crucible Steel vice-president Sutton said “If he [Henderson] was a little more patient and gave manufacturers a chance, the smoke nuisance in Pittsburgh would be done away with in a couple of years.”

In the midst of slow movement toward prosecution and complaints about inadequate enforcement, celebration of success continued. One article even claimed “Smoke Abatement Campaign Began Last Century Is Nearing End.” Drawing on O’Connor’s work on the history of the smoke nuisance, the article portrayed a smokier past – even in Pittsburgh’s earliest days – in contrast to the smoke-controlled present. It predicted an even less smoky future. This article formed part of the publicity campaign for Smoke Abatement Week 1916. Speeches by visitors from other cities during Smoke Abatement Week praised Pittsburgh’s progress. Osborn Monnett, former chief smoke inspector of Chicago, claimed that

Pittsburgh has made the most rapid advance of any city interested in the abatement of smoke with the smallest cost...and while the clearing of Pittsburgh’s skyline was still some distance off the condition at present was a great deal better than several years ago and that a few years would see the smoke cut down to a commercial minimum.

Porter of Pittsburgh’s bureau predicted smokeless Pittsburgh within the year, but Chicago expert Monnett claimed that this would be impossible because of the many industries just outside of Pittsburgh’s limits polluting its air.
During the Smoke Abatement Week John O’Connor offered educational advice to industrial establishments about smoke abatement. He also published the names of the worst violators in city newspapers. These included large and small steel makers and metal works: American Steel and Wire Company, Crucible Steel Company, Carnegie Steel Company, Brown’s Mill, National Tube Company, Union Steel Casting Company, Pittsburgh Spring and Steel Company, Pittsburgh Pressed Steel Car Company and Hebbenstall Forge and Knife Company; Duquesne Light Company, Brunot’s Island and Twentieth Street power plants; Booth and Flinn Brick Yards, Pittsburgh Block and Manufacturing Company, Iron City Sand Company, Rogers Sand Company; Consolidated Ice Company and Standard Ice Company as well as the city’s Brilliant Pumping Station and Schenley High School. O’Connor did not restrain himself from pointing the finger either at power or at beneficence. He targeted the city by listing their pumping station and high school. The Booth and Flinn Brick Yards had been linked to the public-works contracting component of the Magee-Flinn political machine. Duquesne Light had run an advertisement, accompanying the Gazette Times coverage of the exhibit, promoting its smokeless central power stations.

Henderson could not match O’Connor’s zeal. In January 1917 the fourth annual meeting of the Smoke and Dust Abatement League criticized Henderson for “failing to enforce the smoke ordinance by prosecuting offenders.” In her report H. Marie Dermitt (former LHPA activist) “reviewed the numbers of times Mr. Henderson has postponed legal action against offenders and noted the fact that the smoke ordinance was recently passed in reinforced form.” She “urged immediate prosecution.” Eager to appear cooperative, Henderson seconded the motion as it was read. The Oakland Board of Trade
sought help at the meeting on the question of what authority should enforce the superior court decree against “the emission of ore dust by certain mills along the Monongehela River” – still a problem after the Pennsylvania Supreme Court’s 1907 reversal of the contempt decree against Jones and Laughlin. The task of taking action on this was given over to O’Connor while similar work on other mills was given over to Hamerschlag and plans were made to study the ore dust nuisance.\textsuperscript{214} The SDAL was poised to engage in a long-standing pollution controversy in which one of the city’s largest employers had expended vast resources to avoid prosecution.

Despite assistant smoke inspector Porter’s claims about the success of cooperation in the summer of 1917, Henderson was finally moving closer to enforcement of the ordinance in the courts. He announced: the “long campaign of moral suasion and cooperation will give way to more drastic methods.” Yet Henderson, while preparing suits, said cooperation was not a failure: the biggest smoke complainers to the bureau were reformed smokers. Nonetheless, Henderson was ready to target a big steel manufacturer who wouldn’t modify its furnaces. He found smoke abatement to be an even more urgent matter due to problems with the natural gas supply causing many industries to switch back to coal in the coming fall. He took this as no excuse for smoke-making, however.\textsuperscript{215} Henderson started to prosecute P. McGraw Wool, H.J. Heinz, Pittsburgh Valve Foundry and Construction and finally Crucible Steel. He said: “moral suasion has failed in these cases.” His future policy would be prosecution of any concern with more than three violations in one month. He warned that the city was about to prosecute many more violators, including those firms who had installed abatement equipment without first checking with the department.\textsuperscript{216}
Ironically, the national press had picked up Henderson’s rhetoric of cooperation in the very year that prosecutions would finally commence. In his 1917 smoke abatement handbook, Henderson listed eighteen prosecutions in which violators were assessed fines and court costs. Ever the conciliator, Henderson included an account of a convicted mill vice-president who thanked him for bringing suit, remarking, “this will be to our benefit.” Nonetheless, in July 1917, the Christian Science Monitor had praised Pittsburgh’s 50% smoke reduction. While many cities of the “North and East” had to rely on ordinances, the journal explained, in Pittsburgh many large steel mills simply cooperated with authorities. Henderson had followed in the footsteps of his predecessors in postponing prosecution and gathering accolades for smoke abatement progress that may or may not have been real. Yet, his talent for bringing conflicts among interested parties out into the open was exceptional. By sharing letters critical of his administration with violators and reprinting them in his reports, and by seconding motions urging him to more vigorous action, Henderson facilitated honest negotiations about smoke among multiple interested parties. In addition, it was only after he had gained the trust of industrialists through his patience under pressure that he finally engaged in prosecution. It is difficult to know what such a policy, built on such a basis, would have accomplished if war had not intervened.

4.11 “War Smoke is not to Envelop Pittsburgh”

Into the midst of this dialectic of national praise and (carefully managed) local conflict came the demands of war production. Smoke abatement in Pittsburgh faced difficulties as the Great War approached. Henderson said: “war smoke is not to envelope Pittsburgh and
there will be no relaxation of the smoke ordinance unless the national government directly orders that the ordinance be held in abeyance or modified.” Prosecutions would go right on. Henderson entered into direct conflict with officials of the federal government on this matter. Secretary of the Interior Franklin B. Lane, addressing the coal production committee of the Department of Interior, said smoke ordinances should be changed to “remove all restriction upon the operation to the maximum point of all industries...I can see where it may be necessary to have some change made in the ordinances of some cities with respect to the character of the coal used.” In response Henderson sent the secretary a letter saying that such statements contradicted government coal conservation policy. The letter he received in return said “war meant smoke,” despite smoke abatement being economical. Henderson advocated use of powdered coal to meet both smoke abatement and coal conservation goals: it gave 60% more heat units per fixed quantity than regular coal. Pulverized coal was fed into the furnace with an air blast creating “a form of instant consumption similar to that of gas in proper combustion.”

Henderson connected smoke abatement in Pittsburgh to the national war effort by tapping into the rhetoric of patriotic conservation. Although the cheapness of Pittsburgh coal had long made fuel economy one of the weaker arguments for smoke abatement in Pittsburgh, Henderson re-emphasized it at this juncture. He spoke of coal waste at a Bureau of Smoke Regulation meeting with manufacturers, power plant and apartment house owners, architects and engineers held in Chamber of Commerce offices. Henderson read an estimate of coal waste in proportion to that consumed: 150 thousand tons to 600 million tons (25%). He also continued to chart Pittsburgh’s progress through
weather bureau statistics: Pittsburgh had three fewer dense smoke days in 1917 than in 1916 and used more coal than in any city in the country. Though Henderson appeared to have been dragged into zealous prosecution of polluters, he received wide recognition for the program’s success. He was invited to address the aldermen of St. Louis after giving an address to the American Civic Association meeting in that city. Richard B. Watrous, secretary of the American Civic Association wanted to know “how Pittsburgh has been so successfully eliminating smoke.” The St. Louis aldermen were considering a smoke bill and the “secretary of the Civic League of St. Louis has declared a great service could be performed for that city by the spread of the Pittsburgh idea.”

Despite these acknowledged claims of success, SDAL president Hamerschlag warned that more coal “than ever” would be required in Pittsburgh in the coming winter. Like Henderson, he re-emphasized fuel conservation in light of war time demands and scarcities. According to Hamerschlag, increased coal consumption should compel coal users to take waste more seriously than ever before. He took burning coal the old way as equivalent to using “10 tons where 6 would do” and argued that “demand for fuel conservation in the interests of our war activities” was a “patriotic duty.” He suggested that smoke laws existed only to compel those not doing their patriotic duty. Ironically, the demands of war production, as endorsed by federal authorities, offered a perfect excuse for violation of smoke abatement regulations.
4.12 Interpretations: Insurgency to Efficiency? Environmentalism to Conservationism?

David Stradling offers a rich and detailed analysis of the fate of nationwide smoke abatement efforts during the Great War, and much of his attention focuses on Pittsburgh. For Stradling, “Efficiency, not health or beauty had become the rallying cry, in Pittsburgh and around the nation.” Stradling chronicles the way in which transportation difficulties, cold weather and the demands of war production combined to create “a real coal famine” – the United States’ “first energy crisis” in the winter of 1917-1918. He argues that the government’s response to this crisis emphasized transportation and mining efficiencies, and even energy use restrictions and the introduction of Daylight Savings Time, over efficient combustion. Stradling argues that long-term returns from investment in smoke abatement paled in comparison with short-term war profits.

Nationwide, air quality declined during the war. Stradling contends: “Pure air was no longer a natural right but a noble goal worthy of consideration.” He takes the failure of smoke abatement during World War I as a failure of “anti-smoke environmentalism stressing the importance of health beauty and cleanliness” which would be replaced by “anti-smoke conservationism stressing economy and efficiency.” In his view, smoke’s reduction to the economic prevented protection of air quality during the Great War.

While Pittsburgh officials and activists connected smoke abatement with the national discourse on conservation and efficiency in the teens, and especially during the war, it is misleading to see the Pittsburgh movement as grounded only in efficiency considerations. More significant in Pittsburgh was a longer term reorientation toward the economic valuing of environmental amenities begun in the late nineteenth century. Smoke damage rather than fuel waste was central to on-going economic arguments...
against smoke in Pittsburgh. Local coal was particularly cheap, so it was difficult to convince manufacturers to abate smoke on fuel efficiency grounds alone. Pittsburgh furnace-tenders had a long history of experimenting with smoke abatement, promoted on the basis of marginal fuel savings. Ample experience left little to the imagination. More ephemeral cultural reasons were operative as well. Pittsburghers, as I have argued, struggled consciously with exceptionalism. The city’s exceptional character was in part based on values of Calvinist and frontier austerity threatened by the national ascendency of the domestic values which had grounded nineteenth century women’s reform. Because of the kind of place Pittsburgh was, important issues could enter into public debate only by being cast in economic terms. As we have seen, domestic values of comfort, cleanliness and enjoyment of property, central to nineteenth century ideologies of domesticity, had taken on economic value by the turn of the twentieth century. This is evident from the reports of the Chamber of Commerce about the importance of smoke control to real estate, tourism, and light industry, in the centrality of domestic life in the Pittsburgh Survey and in MISI’s highlighting of smoke as a threat to household cleanliness and decoration, property values and retail commerce. This broader understanding of the economically grounded responses to the Pittsburgh Survey’s questions about civic social responsibility and to Andrew Carnegie’s doubts about Pittsburgh’s industrial future. Economic arguments against smoke in Pittsburgh were embedded in this framework.

In addition, focus on smoke had allowed local progressives to adapt the social survey form and use it to address problems of economic prosperity rather than to take on social conditions directly. Smoke was used to link the concerns of Carnegie and of
Kellogg – immediately in the *Economic Survey* but more throughly in ongoing MISH work. Furthermore, MISH survey distribution and subsequent publicity, which considered multiple motivations for smoke abatement, forced Pittsburghers to examine their real reasons for wanting smoke abatement. Yet, the rhetoric of conservation was attractive to local activists, particularly during the war. Assigning economic value to local coal based on national scarcity finally provided a reason to refrain from wasting even cheap Pittsburgh coal. During wartime, national considerations swamped local ones – the way to connect smoke abatement with the national predicament was to emphasize coal conservation and efficiency as a patriotic duty.

Stradling encourages us not to regard the national shift he describes and its negative consequences for smoke abatement as inevitable. He captures important features of air pollution when he says:

> If the shifting focus of smoke abatement from public environmental concerns toward private efficiency issues seems natural, ordinary, or even necessary, compare the issues of pure air and pure water... It seems reasonable to suggest that urbanites would have balked at giving up potable water in an effort to fight a war in Europe, or that municipalities would have allowed sewage to collect in puddles in city streets while shifting resources toward more immediate war needs.\(^{227}\)

It is instructive to note, however, that, in Pittsburgh, potable water was a negotiable good in the first decades of the twentieth century. The efficacy of public investment was only clear after the city’s new filtration system, completed in 1909, after a fourteen-year delay, moved Pittsburgh’s typhoid deathrate from first in the nation to near the national average (by 1913).\(^{228}\) In contrast, health results on smoke were not only inconclusive, as we have seen from MISH studies, but they did not fit into the bacteriological model that had captured both the scientific and popular imagination. The difficulties of MISH research
exemplify this contrast. MISI’s stand-alone health-based reform imperatives were weak. Yet its wide-ranging considerations of health, aesthetics, morals and smoke’s effects on the natural and built environment – and the scientific prestige they carried with them – powered the local smoke abatement movement into the 1920s. Pittsburgh had known no previous environmentalist Golden Age – in which pure air had been a “natural right” rather than a “noble goal.” In the valuation of environmental amenities in Pittsburgh, there was no place to go but up.

4.13 Conclusion

In the first and second decades of the twentieth century, Pittsburgh was the subject of national criticism. Local leaders, by and large, rebuffed calls for basic reforms of the city’s industrial system. Yet, they embraced reform projects that could be undertaken without threatening fundamental economic structures. Smoke abatement, as it was conducted in Pittsburgh in these years, served as just such a project. MISI, seemingly undertaken with great hope and seriousness, was to solve Pittsburgh’s most characteristic problem by removing it from the political domain and subjecting it to the application of expert knowledge. MISI, by subjecting Pittsburgh’s characteristic local problem to universal science, was yet another attempt to reject the exceptionalism that helped to make Pittsburgh the “Gateway to the West,” the “Forge of the Universe,” and “the Smoky City.”

In accordance with the social survey model and like any other Mellon enterprise, MISI was expected to produce tangible results in a limited period of time. Tension between the goals of reform research and of university science, not directed at providing
justification for activism, marked the investigation. Results were published, in some
cases, after one year of investigation, and in others after three, and the quality and clarity
of these results varied widely. Some studies on smoke and health were of questionable
quality, others produced findings that were either inconclusive or that detracted from the
cause of smoke abatement. Studies of the effects of smoke and soot on vegetation were
similarly inconclusive. Studies concerning the effects of smoke on weather were well-
done and clearly supported smoke abatement; yet they were not well-publicized.

MISI’s economic and architectural effects bulletins provided the strongest and
most widely-acknowledged support for smoke abatement. The smoke damage reported
and economically quantified in these bulletins threatened goods that would not have been
acknowledged as economically significant in mid-nineteenth century Pittsburgh. That
these studies and not those of health effects or fuel waste provided the best support for
abatement is further evidence of the reorientation of values begun, roughly, in the 1880s,
which turned the goods smoke threatened from luxuries into necessities. Similarly,
MISI’s badly done psychological effects bulletin was widely discussed in the
newspapers: again highlighting goods not valued in a more austere culture focused on
economic sustenance. The increased importance of these concerns and the lack of
prominence of the fuel waste argument makes Pittsburgh an exception to arguments by
Dale Grinder and David Stradling in which efficiency values overtake all others as the
smoke abatement movement progresses.

MISI’s economic studies were widely publicized and discussed. They captured
some of the strongest motivations for smoke abatement activism in Pittsburgh. MISI
studies about the sources of and responsibility for smoke, while conducted with equal
care and enunciated with equal confidence, were much less accurately reported. The Engineering Phases bulletin clearly identified industrial smoke as Pittsburgh’s biggest problem. Yet, in the reform of smoke regulation immediately following the MISO reports, it was railroads, which investigators would identify as a secondary problem, that became the major targets of intensified enforcement.

The MISO-directed Smoke and Dust Abatement League energetically urged the smoke inspector to prosecute industrial violators. As Smoke Inspector Henderson finally began to capitulate to these demands, Pittsburgh’s success at smoke abatement, claimed both by him and by his predecessor, received consistent national attention. Just a few years after the Bureau of Municipal Research had criticized Pittsburgh as having the nation’s largest smoke problem and the weakest ordinance, officials from other cities hoped for the spread of the “Pittsburgh Idea” in smoke abatement. As pressure for smoke abatement, based on the costs of smoke damage, peaked, the US entry into World War I provided Pittsburgh with an argument for the conservation even of cheap Pittsburgh coal: it was needed for the war effort. As David Stradling, has noted, the efficiency argument was an inadequate basis for sustaining an environmental movement. Yet only through it could local struggles be connected to the national emergency. Apparently, however, Pittsburgh’s industrial products counted for more, at the national level, than the local amenities smoke threatened. Smoke Inspector Henderson exchanged indignant, if ineffectual, letters with federal officials arguing that coal conservation – even in Pittsburgh – was as much a patriotic duty as vigorous war production.

The resiliency of other arguments for smoke abatement, the economic cost of smoke damage prominent among them, is suggested by the claims that would be made
about Pittsburgh’s greater success (in comparison with other cities) at minimizing wartime smoke increases. A 1920 article in the *Pittsburgh Sun* praised Pittsburgh’s wartime smoke inspector, William E. Porter, who had not “permitt[ed] the war to cause complete relaxation in this matter, as it did in Chicago and a number of other cities.”

Pittsburgh was more free from the smoke nuisance than several other municipalities which have never been thought of as particularly afflicted in this respect. Even New York City, according to such a disinterested witness as the United States Weather Bureau, had fewer clear days in 1918 than Pittsburgh. The bureau made the term “smoky city” as applied to Pittsburgh a libel.229

The article’s purpose was to announce the appointment of a new smoke inspector, University of Pittsburgh School of Mines dean H. B. Meller, who would also take charge of another generation of wide-ranging Mellon Institute smoke studies in the 1920s and 1930s. These difficult years, marked by industrial and cultural upheaval, would bring further and deeper reconsideration of Pittsburgh’s relationship to bituminous coal and to its smoke.

Notes


3. Edwards, Appellant, v. Pittsburg Junction Railroad Company, 215 Pa. 597, 64 A. 798 (Supreme Court of Pennsylvania, March 14, 1906, Argued June 27, 1906). As we have seen in the previous chapter, the lower court’s dismissal of Thaw Edward’s request for the injunction was overturned on June 27, 1906. This was just two days after the shooting.

4. [Cushing], *History of Allegheny County*, 227-9.

6. This comparison, however, shows that the Economic Survey saw itself as within the genre of surveys focusing on urban social problems. Holdsworth, Report of the Economic Survey, 3.

7. See Kleinberg, The Shadow of the Mills, 21-22, 24, on Pittsburgh unemployment as compared with that of other cities in 1890.


23. Starrett, Through one hundred and fifty years, 470.


26. Applied Fellowships and Projects, Mellon Institute, 1907 to Date (1970), photocopy from Joel Tarr’s personal files, and Starrett, Through one hundred and fifty years, 470.


30. Since beehive ovens required very high quality bituminous, which was scarce in Europe, and abundant in the United States, particularly in the Connellsville Coke Region, it was in Europe that alternative coking methods were developed. By-product coke production required more capital investment than beehive production. United States investors were disinclined to provide the money since, in addition, there was little market for coal by-products beyond the quantity already available through the well-developed German organic chemicals industry. Just after 1900 a few United States coal companies and iron and steel mills constructed by-product plants, but greater development would not occur until after 1914. Tarr, “Searching for a Sink,” 16, 19.


35. Hersh remarked “Here was an alchemy – to exploit their patrimony, that diabolical b[l]ack mantle [the regional abundance of coal], and produce through science and capital this completely new, redemptive universe.” Hersh, The Mellon Family, 157.


38. Raymond C. Benner, undated memo, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16.

39. Raymond C. Benner, undated memo, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16.


41. John J. O’Connor to Paul Kellogg, September 20, 1912, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16; John J. O’Connor to Paul Kellogg to C. W. A. Veditz, March 4, 1912, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16.

42. John J. O’Connor to Paul Kellogg, May 7, 1912, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16.

43. Paul Kellogg to John J. O’Connor, May 10, 1912, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16.
44. John J. O’Connor to Paul Kellogg, September 20, 1912, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16.

45. John J. O’Connor to Paul Kellogg, August 29, 1913, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16; John J. O’Connor to Paul Kellogg, September 16, 1913, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16; John J. O’Connor to Paul Kellogg, October 4, 1913, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16; John J. O’Connor to Paul Kellogg, October 16, 1913, AIS: Mellon Institute of Industrial Research Series 1, Box 1 F. 16.


53. J.E. Wallace Wallin, “Psychological Aspects of the Problem of Atmospheric Smoke Pollution,” Mellon Institute of Industrial Research Smoke Investigation Bulletin No. 3 (Pittsburgh: University of Pittsburgh, 1913): 8. Wallin conjecturally attributed Pittsburgh’s “low esteem” “in the world of productive scholarship” to “the fact that the air which its scientists must breathe is polluted and poisoned by smoke.” He went on, emphasizing ways in which Pittsburgh fell short of its peers in civic culture, attributing these, again conjecturally, to smoke: “Is it possible that the highest spiritual creations of the citizens of smoke-begrimed cities are being sacrificed on the altar of commercial greed? Is it possible that, in the interests of a pseudo-economy we are impairing the very brains of the people by permitting our breathing air to be saturated with the poisons of preventable fumes? Is it possible that the industrial energy for which Pittsburgh has become famous is less due to the surpassing excellence of the brain and brawn of its workers than to the munificent bounty of its mines?” In this way Wallin dismantled James Parton’s ideological structure in which coal and its smoke were evidence, product and sign of the industry of Pittsburgh’s workers and the intelligence of its technicians. For Wallin labor and technological excellence coupled with coal smoke were not mutually reinforcing and necessarily connected factors but causal alternatives in the explanation of Pittsburgh’s prodigious industrial development. Wallin, “Psychological Aspects,” 9.

Wallin suggested that results of his study should be made more complete with “systematic psychological research” distributing questionnaires to children and adults. The “valuable experiential, observational and impressionistic data” collected by such studies should then be supplemented with experiments to “measure in quantitative terms under controlled conditions of smoke density, the influence of smoke upon the functional efficiency of various sensory motor and intellectual processes.” Wallin believed himself to be prevented from engaging in such studies, however, since “To prosecute such a research one requires controlled subjects, controlled apparatus and controlled smoke rooms.” These conditions were apparently beyond the capacity of Mellon money to supply. Wallin, “Psychological Aspects,” 43.
54. Wallin’s orientation contained within it many assumptions about what was valuable in civic life that would have been foreign to the dominant view about Pittsburgh smoke expressed in the 1860s and 1870s. Wallin quoted J. T. Holdsworth, Dean of the University of Pittsburgh School of Economics and director of the Economic Survey of Pittsburgh: “The smoke nuisance is the greatest hindrance to the highest development of civic beauty and refinement.” Wallin, “Psychological Aspects,” 33. He lamented limitations on artistic expression imposed by smoke and the consequent limitations on artistic education available to Pittsburghers: “Their first, and sometimes only, artistic impressions are derived from an artistically limited and ultra-utilitarian environment, and from besmirched and sordid surroundings instead of from a clear, clean atmosphere of artistic excellence.” Wallin, “Psychological Aspects,” 38. Pittsburgh was handicapped in the production of able artists as well as scientists. In addition, Wallin lamented Pittsburgh’s “enormous economic loss” in the tourist trade and as retirees chose sunny less smoky cities. These assertions show clearly the reorientation of civic values that had taken place. Wallin, “Psychological Aspects,” 40.

55. John J. O’Connor, “The Economic Cost of the Smoke Nuisance to Pittsburgh,” Mellon Institute of Industrial Research Smoke Investigation Bulletin No. 4 (Pittsburgh: University of Pittsburgh, 1913): 5. Estimation of the economic cost of smoke was not new and O’Connor referred to several estimates already done, one in London for the Building Trades Exposition of 1899 and one in Cleveland in 1909 – as well as a number of guesses and more limited studies undertaken by smoke inspectors of other cities. O’Connor, “The Economic Cost of the Smoke Nuisance,” 7-10.


57. As a contrast: this kind of economic argument had been made to the Select Councils of Pittsburgh in the 1890s to convince them to filter the water as a typhoid preventative. Corn, “Public Health in Nineteenth Century Pittsburgh,” 265.


61. O’Connor, “The Economic Cost of the Smoke Nuisance,” 38. In particular he cited a decision by the New York State Supreme Court granting the United States Leasing and Holding Company a judgement of eighteen thousand dollars against the New York Central and Hudson River Railroad Company because the “smoke, soot and cinders from locomotives had cut down the rent” on properties owned by them. O’Connor, “The Economic Cost of Smoke.” O’Connor, “The Economic Cost of the Smoke Nuisance,” 38.


64. O’Connor, “The Economic Cost of the Smoke Nuisance,” 23. O’Connor left aside the economic cost generated by possible injury to health from smoke. The closest he came to connecting dirt from smoke to health was in his discussion of the cost to hospitals of the extra cleaning necessitated by the presence of smoke. He prefaced his discussion by saying that physicians didn’t agree about the health effects of smoke and soot but that they did agree that it increased the costs to hospitals. Based on a survey of the superintendents of Pittsburgh’s hospitals he concluded that cleaning expenses in hospitals were 50-75% greater than they would be if Pittsburgh were smoke free and that smoke and soot added to the difficulty of keeping the operating rooms as clean as they should be. O’Connor, “The Economic Cost of the Smoke Nuisance,” 36.


75. J.F. Clevenger, “The Effect of Soot in Smoke on Vegetation,” Mellon Institute of Industrial Research Smoke Investigation Bulletin No. 7 (Pittsburgh: University of Pittsburgh, 1913). Clevenger lamented that while investigators generally agreed that industrial smoke and gases caused damage to plants, establishing which specific components caused which kind of damage was still an open question, especially since soot from different sources was of different composition. Clevenger did dismiss the hypothesis that the injury to plants was the purely mechanical one of the plugging of stomata since no more stomata were clogged in smoky than in clear regions. He regretted that he did not “obtain the much more pronounced results” he had expected from his experiments with soot exposure.


78. Cohoe, “The Relation of Atmospheric Smoke and Health,” 8, 12. Yet Cohoe did nothing to dismiss the epidemiological and physiological evidence adduced that 1) coal dust can remain imbedded under the skin for years without producing irritation 2) in mining districts more women than men died of tuberculosis 3) mining surgeons said tuberculosis was not as common in mining as in other regions 4) in most cases of tuberculosis that did occur in mining regions there was a strong family history. Cohoe, “The Relation of Atmospheric Smoke and Health,” 11-12.


81. Cohoe, “The Relation of Atmospheric Smoke and Health,” 28. Ascher challenged the claim that coal dust was not an irritant like other industrial dusts. He claimed that smoke’s inflammatory action, unlike that of other dusts, was chemical not physical, that it had an indirect effect on the human organism as “a predisposing cause of illness like alcohol, insanitary dwellings etc.” Cohoe, “The Relation of Atmospheric Smoke and Health,” 29.
82. Cohoe, “The Relation of Atmospheric Smoke and Health,” 29-32. In addition, scientists and physicians were generally unable to establish clear causal mechanisms by which smoke caused disease. One explanation, offered by Bachman, saw the blood of city dwellers as “impoverished” due to exposure to “vitiated air” – a condition giving rise to anemia, visible in the complexion because of the state of the blood in the capillaries. In addition, the acids in smoke, particularly carbon dioxide and sulphuric acid as acting “as protoplasmic...poison, interfering with cellular activity and leading to inhibitory action on the ciliated cells of the respiratory tract” causing the whole lymphatic system to be “flooded with the taking up of poisons” and then in turn producing a predisposition to infection and even possibly arteriosclerosis. Cohoe, “The Relation of Atmospheric Smoke and Health,” 32.

83. Cohoe, “The Relation of Atmospheric Smoke and Health,” 33-36. Chronic bronchitis and emphysema were also associated by many with inhalation of coal dust and soot and were acknowledged to be commonly found among miners. Researchers acknowledged the possible influence of soot on cancer suggested by the case of chimney sweeps’ higher rates of testicular cancer. Yet the consensus as Cohoe articulated it was that “it is scarcely conceivable that the amount of soot in the air of industrial towns is sufficient in amount to be an exciting cause of cancer.” Cohoe, “The Relation of Atmospheric Smoke and Health,” 37, 41-42.

84. Cohoe, “The Relation of Atmospheric Smoke and Health,” 41. Results of the testing of street air suggested that air near factories might contain enough carbon monoxide to damage health. As we have seen in the previous chapter, researchers had been aware for decades that very small amounts of carbon monoxide could be dangerous. Although concern about carbon dioxide in air was also longstanding, by this time the gas was generally understood to be present in urban air in percentages too small to cause acute effects. Nonetheless, Cohoe concluded from his review that: “it is altogether probable... that [exposure to] small amounts [of carbon dioxide]... continued for long periods...would, within limits, tend to have the effects...similar to the effects of large amounts breathed for a short period of time.” Again Cohoe was forced to make the leap from short-duration acute exposures to long-term chronic ones.

Arsenic, contained in most coals in the form of arsenical pyrites, was another health concern. Some researchers argued that most arsenic in air and water came from coal smoke. Arsenic was famous as a poison and a compound whose presence in any quantity was popularly considered frightening. The danger from arsenic in coal was substantiated only by one study of the poor health of miners in regions with heavily arsenical coal. Nitrogen and chlorine vapors in smoke were also noted by researchers as irritating to the respiratory system and as impairing proper action of the blood, but these pollutants were most common in fumes from chemical works and factories employing certain chemical processes. Sulphur dioxide and sulphuric acid had been regarded by most researchers as “probable exciting cause[s] of ill health.” These substances were universally known to cause sneezing, coughing and respiratory irritation, yet sulphur dioxide was also recognized as germicidal. Ascher’s own experiments with sulphur gases showed increased tuberculosis infection rates and lowered resistance but also decreased bacterial action in tuberculous lungs. Several researchers regarded sulphur as a more health-damaging component of smoke than carbon and suggested that soon smoke ordinances would be changed to regulate sulphur emissions as well as black smoke. Cohoe, “The Relation of Atmospheric Smoke and Health,” 42-49.


88. Klotz, “Pulmonary Anthracosis.”


94. White and Shuey, “The Influence of Smoke on Acute and Chronic Lung Infections,” 165-6. They criticized the smoke statistics offered by the US Weather Bureau as leaving a great deal to the discretion of weather observers. After showing that pneumonia death rate was high for all ages in Boston (not just for pneumonia ages) they argued that Boston was missing smoky days because of idiosyncrasies of recording. White and Shuey, “The Influence of Smoke on Acute and Chronic Lung Infections,” 169.


98. O’Connor states that the report was written “for the most part” by Straub, who left the investigation in June, 1913. O’Connor in fact wrote the history portion of the report, as is evident from drafts to be found in the papers at AIS. Since authorship of individual passages cannot be determined and since O’Connor edited the entire Bulletin, I have attributed the thoughts expressed in it to both him and Straub.


101. The business section was a major victim of smoke: “there is probably no portion of the city in which smoke causes more inconveniences and loss, besides affecting directly so many people, as does that made or discharged within the business section or its immediate vicinity.” Smoke in this section came both from large office buildings and the few small manufacturing plants within it. Low chimneys exacerbated the problem. O’Connor and Straub recommended either boiler room remodeling so that firemen could work more carefully, installation of automatic stokers, or the purchase of power from central plants and the use of cleaner fuels like coke or low volatile coal for heat.

O’Connor and Straub clearly identified manufacturing plants including “warehouses, breweries, factories, mills, and electrical and other power plants” as the district’s largest smoke sources. O’Connor and Straub, “Some Engineering Phases of Pittsburgh’s Smoke Problem,” 53-6.

102. “A large number of iron and steel mills and other factories are clustered in lower Allegheny, close to the ‘Point’ of the city, and they produce enormous quantities of black smoke and discharge it at low levels. These mills are within a radius of two miles from the business portion of the city, and because the direction
of the prevailing winds being northwest this smoke is generally carried directly up the Ohio valley and into the city.” O’Connor and Straub, “Some Engineering Phases of Pittsburgh’s Smoke Problem,” 56.


104. O’Connor and Straub went on to examine heating or reheating furnaces, as well as hot air furnaces, which were usually fired by hand with coal, though sometimes with producer or natural gas. They suggested that mechanical stokers could be used to eliminate smoke in these cases and that this increased the quality of the finished product and increased output. With higher more even heat the product would need less time in the furnace and throughput could be increased. Powdered coal was a good option, in their eyes, for these furnaces. O’Connor and Straub, “Some Engineering Phases of Pittsburgh’s Smoke Problem,” 67.


106. Chicago anti-smoke activists were pressing for electrification of locomotives passing through that city at this time, but in 1915 an important study commission would return a report calling electrification technologically feasible but economically impractical. The Pennsylvania Railroad conducted on-going research at its Altoona laboratories on various means of smoke abatement and from as early as 1908 has a force of smoke inspectors employed on its lines in the Pittsburgh district alone. “Fuel Coal Economy,” June 22, 1908, New York Times. For more on railroad smoke control see David Stradling and Joel A. Tarr, “Environmental Activism, Locomotive Smoke, and the Corporate Response: The Case of the Pennsylvania Railroad and Chicago Smoke Control,” Business History Review 73 (Winter 1999): 677-704; Joel A. Tarr and Kenneth Koons, “Railroad Smoke Control: A Case Study in the Regulation of a Mobile Pollution Source,” in Mark Rose and George Daniels, eds. Energy and Transport: Historical Perspectives on Policy Issues (Beverly Hills, Calif.: 1982): 71-92.

107. The bulletin ends with the residence section, which O’Connor and Straub claimed produced “a comparatively small amount of smoke.” Most apartment buildings used natural gas for heating. Where power was necessary for elevators, operators used Pittsburgh coal and hand firing, but occasionally mechanical stokers. When heat was not supplied with natural gas, buildings used bituminous coal and smoked considerably. Chimney soot was then carried off in “large flakes and deposited over the immediate neighborhood.” They said in this case that “the producer is the worst sufferer” – making residential pollution less objectionable because its costs were not unfairly distributed away from polluters. Residential smoke was non-existent in the months of the year when heat was not needed, since natural gas was used for domestic purposes other than heating. As a final note O’Connor and Straub treated “municipal and contractors engines” such as the sand-digger complained of in the 1906 newspaper campaign. They appreciated the annoyance of such engines since they discharged smoke at a low level, but did not regard them as a major factor in the smoke problem. Enforcement of city smoke ordinances would require such engines to burn low volatile coal. O’Connor and Straub, “Some Engineering Phases of Pittsburgh’s Smoke Problem,” 83-4.


117. AIS: Undated (1911-14) draft of article by John O’Connor for Saturday Critic appended to “Report of Veditz and O’Connor For the Week Ending March 16, 1912.”


120. AIS: R. B. Mellon Fellowship Week Ending September 23, 1912.

121. AIS: R. B. Mellon Fellowship Week Ending September 23, 1912.

122. AIS: R. B. Mellon Fellowship Week Ending November 4, 1912.

123. AIS: R. B. Mellon Fellowship Week Ending November 25, 1912.

124. AIS: Undated memo from R. C. Benner (probably just after November 7,1912).


127. AIS: Pamphlet from “Smoke Abatement Exhibit under the auspices of the Smoke and Dust Abatement League of Pittsburgh – The Western Pennsylvania Exposition” August 27 - October 18, 1913.”

128. The investigations, despite the uneven quality of their execution and the ambiguity of their results, carried with them a high level of scientific prestige. This was particularly valuable in Progressive Era America and especially in a city whose cultural achievements had been embarrassingly limited. Pittsburgh had always held its place among cities because of its ability to make a profit from the technological exploitation of nature. Now Mellon Institute connected industrial technology with natural science. Pittsburgh’s industry could see itself as having rested all along on something progressive, modern and culturally refined – scientific knowledge. In addition, if science could tackle Pittsburgh’s smoke problem, which organizations like the Chamber of Commerce had long seen as detrimental to needed economic
diversification, all the better.

Yet, could such factors completely explain the involvement of heavy industry? An additional element must be considered here: given the track record of smoke abatement efforts in the city, industrial polluters had little reason to fear unwanted demands. So far, Pittsburgh smoke inspectors had pursued a cooperative policy involving little prosecution and had focused mainly on railroads. Railroads, under pressure in many cities around the country to abate smoke, were already cooperating. Although the new city smoke ordinance regulated even puddling and heating furnaces, mills had not yet been compelled to comply through prosecution. There was good reason to believe that Pittsburgh smoke abatement efforts would not become a challenge to industry. There was, therefore, no reason not to put on a good show and join the League.

129. Although O’Connor argued that the organization should be simply a conference for the exchange of ideas and have no constitution, so that Mellon staffers and allies could more easily be direct it, he provided his own draft constitution in case his view did not prevail. AIS: R. B. Mellon Fellowship Week Ending November 4, 1912.

130. AIS: R. B. Mellon Fellowship Week Ending January 20, 1913. The national office to be permanently located in Pittsburgh in 1914 largely due to Chamber of Commerce lobbying. Greater Pittsburgh Chamber of Commerce, Fifty Years of the Chamber of Commerce, 94-5.

131. “Interview with Mr. Stevenson” undated, in R. B. Mellon Smoke Fellowship No. 1, 1911-1914, AIS, Mellon Institute of Industrial Research, Series 1, Box 1, F 9.


134. “Organization on Smoke Abatement” in R. B. Mellon Smoke Fellowship No. 1, 1911-1914, Archives of Industrial Society, Mellon Institute of Industrial Research, Series 1, Box 1, F 9.


136. “Meeting is Called to Devise Measures of Smoke Abatement,” Pittsburg Leader, December 8, 1912.


138. AIS: Pamphlet from “Smoke Abatement Exhibit under the auspices of the Smoke and Dust Abatement League of Pittsburgh – The Western Pennsylvania Exposition” August 27 - October 18, 1913.” AIS: R. B. Mellon Fellowship Week Ending November 23, 1912. AIS: R. B. Mellon Fellowship From December 23, 1912 to January 13, 1913. Yet, at the end of 1912, O’Connor was still struggling with the Chamber over the plan of organization for the new organization, and had prevailed upon prominent men in the Civic Commission and Board of Trade to speak with Todd “in favor of the broader plan of organization.” By this point O’Connor was treating Dermitt as an ally on this issue. AIS: R. B. Mellon Fellowship From Dec. 23rd 1912 to Jan 12th 1913.

139. AIS: R. B. Mellon Fellowship Week Ending January 20, 1913.

140. “12,000 Attend the Exposition,” Pittsburgh Telegraph, August 28, 1913.

141. “Smoke Abatement Exhibit under the Auspices of the Smoke and Dust Abatement League,” AIS, Mellon Institute of Industrial Research, Series 3, Box 4, F 1.
142. AIS: R. B. Mellon Fellowship Week Ending October 2, 1911.

143. AIS: R. B. Mellon Fellowship Week Ending June 24, 1912.

144. AIS: R. B. Mellon Fellowship Week Ending September 23, 1912.


146. “Almost Free From Smoke In One Year,” April 6, 1913. (No newspaper notation.)

147. AIS: R. B. Mellon Fellowship Week Ending April 14, 1913.


149. AIS: undated memo R. C. Benner (probably April 1913).

150. New York had established its Bureau of Municipal Research in 1906 and a number of other cities had done the same between 1906 and 1913. Such Bureaus were usually funded by coalitions of civic organizations interested in “good government” and their purpose was to provide expert analysis and advice for civic officials about the administration of municipal government. This was the second time in a decade (the first was in 1908) that Pittsburgh’s City Council had hired the New York bureau to evaluate its municipal administration. Holdsworth discusses such bureaus and recommends that Pittsburgh establish one of its own in the Economic Survey. Holdsworth, Report of the Economic Survey, 220-25.


152. “Expert Wrong In His Report,” Pittsburgh Dispatch, November 2, 1913.

153. Even after O’Connor’s results were widely available, it would take great effort on the part of MISI investigators and their allies to move the focus of Pittsburgh’s smoke abatement movement away from railroads and onto stationary industry. Compelling public officials to employ the full force of the law against homegrown stationary industries would require even more MISI exertion. Railroads were an attractive target for cultural reasons as well. Focusing on railroads in Pittsburgh put city smoke abatement efforts more in line with national ones. It was a diversion from the special industrial pollution problems that made Pittsburgh the Smoky City. In one way, keeping the Pittsburgh smoke abatement movement in step with the national one was a way to deny Pittsburgh’s exceptional character and to connect it to universal civic standards. Ironically, efforts to make this connection contributed to the perpetuation of the exceptional features of Pittsburgh’s environment that made it the butt of jokes about smoke such as those made by Life magazine in 1912 – jokes that could not be made with such force about any other American city.


155. “International Association to Meet in Pittsburg Next Month,” Pittsburg Dispatch, August 17, 1913; Pittsburg Leader, September 7, 1913. For more on the history and character of this organization see Stradling, Smokestacks and Progressives, 103-7.

156. “President is Elected by Smoke Delegates,” September 13, 1913. (No newspaper designation.)
158. AIS: R. B. Mellon Fellowship Week Ending November 22, 1913.
159. AIS: R. B. Mellon Fellowship Week Ending November 22, 1913.
162. “Smoke Abatement,” Pittsburgh Sun, November 16, 1913.
165. AIS: R. B. Mellon Fellowship Week Ending December 6, 1913: When Searle did reply, the New York Bureau (Dr. McCombs) asked MISI’s help in responding to him. AIS: R. B. Mellon Fellowship Week Ending December 13, 1913.
166. “Searle’s Job Hangs In the Balance,” Pittsburgh Gazette Times, December 24, 1913.
177. AIS: R. B. Mellon Fellowship Week Ending February 14, 1914.


196. “Pittsburgh Fast Ridding Itself of Smoke” (no date, no newspaper designation).


202. Lucius H. Cannon, Smoke Abatement: A Study of the Police Power (St. Louis Public Library, 1924): 276. As in earlier years, violators would be brought before aldermen who acted as judges, and could assess fines or (at least after the 1917 ordinance), sentence violators to up to 30 days in jail.


207. Thomas R. Marshall was Indiana governor from 1909 to 1913 and vice president under Woodrow Wilson.


211. “Expert Says That This City Has Made Greater Progress Than Any Other,” Pittsburgh Telegraph, October 24, 1916.

212. “Expert Says That This City Has Made Greater Progress Than Any Other.”


221. Pittsburgh Gazette Times, October 23, 1917.

222. Stradling, Smokestacks and Progressives, 141.

223. Stradling, Smokestacks and Progressives, 142.

224. Stradling, Smokestacks and Progressives, 147.

225. Stradling, Smokestacks and Progressives, 150.


229. “Smoke Bureau Head Named,” *Pittsburgh Sun*, 1920 (The rest of the date is illegible.)
CHAPTER 5

DARK AGE TO RENAISSANCE?

Atlantic Monthly’s May 1951 “The Pittsburgh Story” began with the word “Renaissance” standing alone in 30 point type-face in the upper left corner of the first page. The Atlantic then proclaimed:

Every American city of size is working on a Master Plan – a plan calling for a better routing of through traffic, for quicker access to the airport, for slum clearance, for park development and smoke control. The two which have achieved the most substantial transformation are New York under Robert Moses, and Pittsburgh....

The article recapitulated the worries that had beset Pittsburgh before its post-war revitalization.

...the oldest, biggest, and most powerful center of heavy industry, the leading steel-maker for all the world, was shriveling away. Even the steel boom of World War II was not enough to keep it from the edge of disaster. It had become rundown, overcrowded, outdated. The decrepitude showed.... above all, in the dense choking smoke that covered the city and the river valleys with gray despair....

...Then, suddenly, something happened. An anti-smoke ordinance was passed and, even more remarkable, was enforced. To use a phrase Pittsburhers never seem to tire of, “the smoke cleared from the skies.” Then the government got busy: federal money came into the program for flood control, highway projects, a new airport.¹

In June 1952 Fortune published “Pittsburgh Rebuilds.” Next to a picture of the “Golden Triangle” central business district, the article, which was part photo-spread, proclaimed:
Up from the ashes of its steel-town past, Pittsburgh is entering an era of light, spaciousness, and reconstruction. A new civic, spirit, sparked by a new generation of top businessmen, is behind it.... A remarkable alignment of civic groups, public agencies and a new generation of business leaders, beginning with Richard King Mellon, was resolved that the drift of old age, obsolescence, and planlessness must be reversed.²

Collier’s in May 1953 announced “You’d Never Know Pittsburgh,” quoting a train porter the author had interviewed at arrival. The journalist, after an eight year absence from the city “stood blinking in the bright sunlight” and asked the porter where the “the old smoke-filled train shed” was. The porter replied, laughing “It’s gone...So’s the smoke.

You’d never know Pittsburgh.” The journalist concurred:

He was right. I didn’t recognize Pittsburgh. Gone was the well-remembered smog that once blanketed the downtown areas so thickly that street lights had to be turned on at 10:00 A.M. Gone too, or going, were many of the black and ugly buildings that smoke and fumes had hidden for so many years...Over the rubble of the old Pittsburgh a new city was rising. In all, I found, nearly one fourth of the Golden Triangle – Pittsburgh’s business section – was being rebuilt.

The article claimed:

Everyone in Pittsburgh from bank presidents to taxicab drivers credit smoke control with finally awakening and rousing the whole city. A taxi driver summed up for me the way it changed people’s attitudes. “Listen buddy, He said, “when you can end the smoke in a city like Pittsburgh, you can do anything.”³

Life in May 1956 ran photographs by Margaret Bourke-White depicting the new Pittsburgh.⁴ These examples represent a much larger body of articles celebrating the “Pittsburgh Renaissance” in the national press of the 1940s, 1950s and into the 1960s. Coverage began in the mid-1940s with tentative evaluations of the redevelopment program as it was planned and initially implemented. Articles like “Pittsburgh’s New Powers” in Fortune, “New Day Dawning for Pittsburgh,” “Towards a Cleaner and Brighter Pittsburgh,” and “Welcome Weeks’ Boost Pittsburgh’s Attractions” in The
American City; “Clearing Pittsburgh’s Air” and “Pittsburgh Comes Out of the Smog” in Newsweek; “Smoke Sleuths” in Life,”Big-time Community Planning” in Commonweal; and “Pittsburgh Remodels Itself” in Business Week are representative. Additional articles from the 1950s bore similar titles: “Pittsburgh’s Thrilling Civic Renaissance,” “Pittsburgh Cleans Up For Company,” “The New City Called Pittsburgh,” and “Comeback City.” Coverage of Pittsburgh’s rebirth extended even to Vogue, which included in its February 1960 issue a double-page photo of the Golden Triangle by Walker Evans accompanied by the title “Futurity Stake: Pittsburgh.” A single paragraph of text mentioned smoke reduction and characterized Pittsburgh as betting “its money on itself” and on its own future.

The “Pittsburgh Renaissance” was touted as a model solution to the urban decay and industrial stagnation that threatened postwar American cities. During the depression and war, Pittsburgh had become a national symbol for these dangers. Its Renaissance similarly represented the possibilities for revitalization in cities whose histories were not so dark and whose prospects had not been supposed to be so dim. The Renaissance has been represented as a landmark in the cooperation of opposing political forces: Republican billionaire Richard King Mellon and Democratic union-backed mayor David L. Lawrence. The miraculous cooperation produces a miraculous result: the complete transformation of the nation’s most economically troubled and ugliest city — from a pig into a princess. Some Pittsburghers still look back in wonder at the magical feat. Others, like historian Roy Lubove see the Pittsburgh Renaissance as the creation of a “reverse welfare state” for corporate benefit. The Renaissance perhaps has altered significance in
the long aftermath of the collapse of the local steel industry in the late 1970s and early 1980s.

In this chapter I will concentrate on the period before the Renaissance. I will examine competing conceptions of how Pittsburgh was to emerge from the civic crisis brought to a climax by the Great Depression and World War II and attempt to understand the claims of the Renaissance in terms of them. The period between the World Wars has been characterized in hindsight as Pittsburgh’s smoky Dark Age before its subsequent Renaissance – a time of uniform acquiescence to hundred year old smoke and squalor. Yet these were years, for those who lived through them in the Smoky City, of acknowledged crisis and ubiquitous change. Stories of Pittsburgh between the wars, told in national magazines and newspapers, in articles, poems, stories, film, and photographs, by Pittsburghers and non-resident observers, are self-conscious narratives of transformation. Residents, observers, and critics of the city sifted through competing claims of change accomplished, change expected and change endured. What kind of change this was or was to be, which aspects of the city’s identity were to be treated as foundational and which as alterable, and who would benefit from proposed changes were subjects of local conflict.

Both Pittsburghers and external critics were concerned with the city’s industrial future, and in fact, with its industrial survival. The question of industrial survival was to be worked out largely through discussion of the city’s relationship – both through industry and technology, and in a more basic and unmediated sense – to local nature. Coal and rivers, as always, were central. Threats to Pittsburgh’s industrial survival were rooted in the diminished importance of the geographical advantages long seen as
underpinning the city’s existence: river location and most importantly, cheap coal.

Smoke, through assertions of its reduction, persistence, or painful absence, was a central and symbolically freighted component of the discussion of the future of coal and the way of life built around it.

In this chapter, I will contrast claims that the city’s special historical relationship to labor and nature would guarantee its recovery and survival with claims that civilizational change, embodied in a new aesthetic consciousness or in new technologies, would bring the city into a new economic and cultural era. I will alternate between discussion of these broad visions of the city’s future and discussion of the scientific work on smoke, coal and related technologies at Mellon Institute. As background, it will be necessary to sketch images of Pittsburgh’s character and problems current among residents and in the national press.

5A. The 1920s

Pittsburgh in the 1920s was discussed by local and national writers as a city created by nature—by rivers and by coal. Yet the city’s natural environment was famously degraded. Both Pittsburgh’s technological uses of nature and the beauty of its natural and industrial landscape captured the imagination of writers and artists alike. In the 1920s, also, Pittsburgh was gaining a national reputation in the fine arts. The city’s contrasts, nature and technology, labor and art, are recurring themes. In addition, the 1920s was a period of increasing concern about competition from younger steel centers like Gary and Birmingham and about mounting difficulties in the bituminous coal industry. Work at Mellon Institute, extending the Mellon Institute Smoke Investigation of the previous
decade, connected Pittsburgh’s relationship to art and nature with its relationship to coal and smoke. Throughout the decade, Pittsburgh’s growing reputation for smoke abatement grew in tandem with the reputation of its new found artistic culture.

5A.1 Owls and Windowboxes

Two short stories, written by Pittsburgh authors in the 1920s, illustrate local understandings of the relations between nature, environmental degradation and the city’s prospects. In June of 1923 Haniel Long, who taught English at Carnegie Tech and who had come to Pittsburgh with his missionary father in 1892 to help Homestead strikers, published a comic short story about Pittsburgh’s relationship to nature in The Nation. Long authored other literary depictions of Pittsburgh published in the New Republic and Survey Associates’ Survey Graphic in the 1910s through the 1930s. In “How Pittsburgh Returned to the Jungle” Long envisioned a transformation of the Smoky City into a botanical tourist paradise. The city’s floral rebirth was instigated by a conspiracy between a “millionaire nurseryman,” with a monopoly on the sale of seeds and flowers in the city, and a manufacturer of window boxes. These businessmen attached a rider to unrelated legislation mandating that every window in the city have a window box and the state legislature passed the bill without noticing it. The millionaire’s political influence ensured that the police enforced the law over the protests of skyscraper and factory owners. Meanwhile the nurseryman and window box maker spread propaganda: “platform orators of note appeared mysteriously in the city to lecture on behalf of flowers.” A national association of women’s clubs hired an investigator and, based on his report, supported window boxes. People started to grow flowers in the boxes
here and there: secretaries especially liked them and grew them, creating a new rivalry between adjacent downtown offices and a new reason for bored employees to look out the window. Legal challenges were put down and skyscrapers turned green with vines and flowers. Spaces between the skyscrapers changed in color and the flowers attracted insects and birds. Pictures of Pittsburgh in bloom were promulgated in movies. “The city hitherto notorious as being devoted to naked industry was now featured on all American tours for its beauty, and...[becomes] the Mecca of the recently married, of sightseers disappointed in Niagara, of ornithologists, botanists, and searchers for the exotic.” As a new source of revenue, the travel and tourism business began to influence the economics of the city and huge hotels with equally huge gardens went up.

Long saw pollution and heavy industry as necessarily connected:

In the meantime, though not altogether from the invasion of the window boxes, the city lost its industrial prestige. It had a bitter struggle with competitors younger than itself and more favorably situated for manufacturing. Gary, Pueblo, and Birmingham were like young Titans who proved too strong for their giant father. When the time came that it was no longer expedient to maintain the larger furnaces, Pittsburgh awoke to find its beauty its source of livelihood.

Some abandoned skyscrapers were “given over unreservedly to horticulture.”

Then in deadly earnest did the jungle set out to conquer the city of ravines and gulches. Little by little its tide ran up the river valleys and across the abandoned mills... The air grew clearer. No smoke was permitted and only electric locomotives penetrated the city. The roads and highways were banked with shrubs and blossoms. If the wind blew in the right direction, the citizens of Youngstown, or Morgantown, or Cleveland could smell the fragrance of Pittsburgh from afar. It seemed to them strange and fabulous as it overpowered the sulphur dioxide to which they were accustomed, and they would say to one another, “Oh to be in Pittsburgh, in beautiful Pittsburgh!”

Pittsburgh became known as “a city of unfading flowers.”
Long’s story is funny because, as David Demerest, editor of a collection of short stories about Pittsburgh in which Long’s piece is included, remarks, it reverses our expectations of the city. Nonetheless, the story reinscribed cherished assumptions of Pittsburgh culture: that the economic motives of people with power were the most important sources of urban change, and that heavy industry and degraded nature were so closely connected that natural rebirth might be not only a consequence of industrial decline – but that it could, in fact, help to bring about local industry’s demise.

In 1925 local author Frances Lester Warner read a new short story to a gathering of Pittsburgh Masons. She had recently moved from Boston to Pittsburgh with her husband, who had come to work for the Bureau of Mines. Like Long’s piece, Warner’s story, “The Pittsburgh Owl,” challenged expectations about the city. It did so, however, while glorifying the city’s industrial character, rather than by predicting its complete abandonment. Nonetheless, like “How Pittsburgh Returned to the Jungle,” “The Pittsburgh Owl” captured prevailing assumptions and contradictions concerning Pittsburgh’s relationship to nature.

Warner recounted her experience of hearing what she thought was an owl outside her window and her husband’s insistence that it was only a truck.

When one has always thought of a famous city as being made up largely of smoke and cinders and the Labor Question, any little variation from the advertised normal comes as a surprise. I was perfectly delighted to find one of the most civilized and fully settled areas blossoming forth with owls. Warner’s story simultaneously focused on the unexpected persistence of natural beauty in a city subject to industrial degradation and the equally unexpected opportunities for the enjoyment of artistic culture in a city dominated by work and smoke. Ironically, the story
conveys, more than anything else, the powerful aesthetic appeal of Pittsburgh’s degraded industrial environment itself.

Warner takes the beauties of smoke as central to the city’s character and connects them to the beauties of painting:

...smoke of all colors, not even predominantly black smoke, but snow-white and ochre-yellow and strangely tinted clouds of it – some from coke, some the dust from ore, much of it not smoke at all in the strict sense, but drifting along the rivers and lingering in the valleys...There are Japanese effects in delicate monotones on winter afternoons; airy Claude Monet color-effects at dawn; Whistler bridges and blue twilights; and Turner fires on shadow at pouring time after dark. It is a study of changing mist and colors on vapor, with a background of still other layers of vapors and colors and mist... One of the steel manufacturers likes to take his friends to see one especial smoke that has a coloring which he describes as “Elsie DeWolfish” – a lovely hue of the softest rose-color on a background of canary yellow and pale gray.15

Warner imagines taking a friend who’s never seen Pittsburgh on a flying trip around the city – a tour that would move from “the contemplation of the most colossal of smokestacks” to “the most colossal of organ-pipes, at a Heinroth recital on a Sunday afternoon, in the Carnegie Auditorium.” Yet Warner celebrates Pittsburgh’s masculine roughness alongside its aesthetic appeal and new artistic culture, resurrecting familiar frontier descriptions of the city.

For Pittsburgh is above all the most masculine place in the world. It is more masculine than a mining-camp or a logging-settlement or a whaling-ship, because in those one finds only men’s rough-hewn, knockabout, haphazard make shifts, deliberately rude; whereas in Pittsburgh one sees their finished products, the product wrought out by the masterful, metal-conquering type of man...from one of the highest peaks, it looks like a grand collection of mechanical toys – like playthings...under a little millionaire boy’s Christmas tree. Miles and miles of toy freight-trains, thousands of miniature automobiles running along the suspension bridges like little cashboxes on a wire, toy steamboats, Meccano-bridges and towers, every sort of contrivance that can make a loud noise, or run very fast, or flash a bright light, or go puff-puff. Every city has some of these, but Pittsburgh has them all. And in most cities there are more toys intended expressly for little girls. No woman could have dreamed Pittsburgh...No woman, if consulted, would
have permitted Pittsburgh. We would have told it not to leave its toys all strewn around the pretty rivers over night.\textsuperscript{16}

Technological uses of nature, while they degraded the local landscape also become new expressions of nature’s powers and added a new kind of quasi-natural beauty to the landscape. The “Pittsburgh Owl” endorsed the pervasive view of Pittsburgh in which it was the mixing of nature and technology that gave the city its unique strength and staying power.

It [Pittsburgh] even names some of its streets after its scientific paraphernalia: Crucible Street and Saline, Theodolite Street, Furnace Way, Collier, Bessemer and Tripod Way. Anyone would love its green locust trees, giant flowering almond-bushes, box-elders and sycamores; and the country round about with its clouds of peach-blossoms in the orchards and its big farms where one may keep a family coal-mine and oil-well along with one’s bees....\textsuperscript{17}

In the end Warner confesses her difficulty in maintaining a belief that owls could flourish in such a city, but finally reaffirms her conviction.

I have never heard my Pittsburgh owl again. I still hope to come upon him some evening, for I have seen a wild brown cotton-tail rabbit on the driveway at the Bureau of Mines and a bumblebee near the corner of Craig Street and Forbes. Moreover a Pittsburgh friend assures me that there has always been an owl’s nest in the cornice of one of the neighboring churches, and another in the trees near the Negley Avenue Hill. She tells me that when she was walking home from a Paderewski concert at the Mosque one night, she herself saw three little screech-owls sitting in a row in the moonlight on a telegraph wire...\textsuperscript{18}

That the fauna sightings are notable makes Warner’s incredulity about the owl plausible, but Pittsburgh’s progress in artistic culture subtly bolstered her hopes for natural beauty. All of her nature sightings occur in the neighborhood of Pittsburgh’s celebrated Oakland cultural center. Warner enjoyed both the natural powers that made industry in Pittsburgh possible and the intermixing of non-working nature and working nature in the city.\textsuperscript{19}
Long and Warner were local writers. Yet their stories, together, raise issues that focused national discussion of Pittsburgh in the 1920s: industrial competition and the threat of decline, the awareness of transformation, either already underway or to be expected. Like these stories, articles in national magazines and in the New York Times exposed competing expectations about the form such transformation would take. Would it rely on elements of the city’s character present from its founding, or on newly acquired strengths like art patronage or hypothetical flowerboxes? Like Long and Warner, national journalists both celebrated Pittsburgh’s old industrial and material character, and publicized its new artistic and spiritual aspirations.

5A.2 Overalls or Artist’s Smock?

Pittsburgh’s new artistic orientation was featured in a 1923 New York Times travel article “No Mean Cities of the Middle West: Observations West of Jersey and Further Toward the Setting Sun,” which discussed Pittsburgh, Dayton, Chicago and Detroit. Though the article treated four cities, its only illustration was a painting of a smoky Pittsburgh scene. It characterized Pittsburgh as a city which “America sees in overalls, with a smut on its nose” but which harbored a”vagrant desire to be seen in an artist’s smock.” The article included a dialogue with the city itself in which the Times asked “You’re the greatest steelcenter aren’t you?” and Pittsburgh, personified, answered “Yes, but have you seen our art gallery?” Yet it acknowledged Pittsburgh’s persistent industrial dirt: “black incense rises day and night”, “The greatest optimist in Pittsburgh is the man who wears white trousers.” Despite its emphasis on art, the article ended with smoke –
and with a, perhaps ambivalent, hope for redemption of the city through destruction of its current character:

Pittsburgh either likes its smoke or lies about it... Poor old Pittsburgh! Some day the Lord will be kind and send them a flood – like Dayton, a fire – like San Francisco, or some other beneficent chastisement and then will arise a beautiful city at the meeting of the waters...  

The article was also ambivalent about the relation of the industrial landscape to art. While in the passage above, clean-up appears as a prerequisite to fulfilment of Pittsburgh’s artistic aspirations, the article recognized the interest of the “art of industry” on the walls of the Carnegie Museum and, as noted above, selected a painting of an industrial Pittsburgh scene as its sole illustration.  

“Pittsburgh Peeps at the Stars,” appearing in American Mercury in 1927 advanced claims of artistic distinction already achieved and smoke reduction already accomplished. While beginning with characterizations of Pittsburgh as Hell from James Parton in 1868 and O. Henry in 1906, it claimed “the Smoky City has gradually damped its fires and doffed its turban of soot.” The article did not credit smoke abatement activism so much as rising taxes, which drove industry to cheaper suburban locations, and the discovery of natural gas, still an important source of heat and power even after the natural gas period. The article claimed that “most of the murky clouds generated by soft coal were early banished.” It took Pittsburgh’s atmospheric improvement, from 1906 or so, to be an established fact. The article went on to claim that “At the same time that Pittsburgh was becoming cleaner, her crop of millionaires was ripening, and then came a frantic rush to discover and embrace beauty.” The Carnegie International – “the first really international art exhibition in America” had opened there in 1895. Pittsburgh was not, in this article,
reducible to “...the pathetic scrapings of a social survey, nor the slag-pile of Vulcan’s smithy” but characterized by “immortal stirrings perceptible to the ear of hope.”

As the short stories and articles above suggest, Pittsburgh was the subject of increasing national literary and artistic notice throughout the decade following the Great War. Between 1919 and 1921, for instance, the New Republic published two poems, each by a different author, about the city and Scribners featured a series of eight sketches contrasting the downtown business district with the smoky mills. The New York Times in February 1928 reported on an auction of 83 oil paintings by landscape artist Fritz Thaulow. A painting entitled “Pittsburgh Factories” was one of fewer than ten paintings mentioned in the article by name. In the aftermath of the 1927 Pirates vs Yankees World Series, a New York Times editorial noted Pittsburgh’s “international distinction in its art exhibitions and in its educational institutions, as well as in its vast tonnages of steel.” The article mentioned Pittsburghers’ efforts to “see what is about them in its spiritual and artistic values” – referring to Pittsburghers’ artistic treatment of the city’s own landscape. Nonetheless, the article concluded by praising Pittsburgh’s traditional and characteristic activities more highly than its newfound artistic occupations: “[Pittsburgh] has a symphony of its own produced by mightier instruments than those of any other American city.”

5A.3 “What Kind of a Pittsburgh Is Detroit?”

Despite a common emphasis on art, industry and change, the national press was not univocal in their assessment of Pittsburgh. By the mid-1920s, contradictory views of the city were current in national articles. In October 1926 World’s Work published “What
Kind of a Pittsburgh is Detroit?” which contrasted the consequences of industrial capitalism in Detroit and Pittsburgh. The article, as a literary technique, treated both cities as sequential abodes of the historical archetype of the rich man: “He has made his millions in flocks and herds, he has made them in silks and spices, he has made them in oil, he has made them in iron and steel. Just now he is ‘in’ automobiles....” The rich man had undergone a redemptive transformation in his move to Detroit: “For hitherto, wherever his home or whatever his business, [he] has made a good deal of mess of the community in which he lived.” Pittsburgh was the supreme example of this – a place characterized by the “ugliness he had created along with his fortune.”

Pittsburgh and Detroit were cities of different historical epochs: “Pittsburgh was built by mediaeval-minded men, upon feudal foundations. Detroit was built by modern-minded men, upon new conceptions.” This image contrasts with the nineteenth century characterization of Pittsburgh as a new and daring outpost of the industrial frontier. Once a new city whose initial existence had to be argued for, Pittsburgh was now an old and ailing city for whom continued life-support had to be justified. Feudal Pittsburgh “took orders” from the likes of Henry Clay Frick and Andrew Mellon, whereas Henry Ford held no such fealty. The article reiterated the fifteen-year-old Pittsburgh Survey’s findings on overwork, civic fragmentation, high disease rates, and employer-dominated politics. While it acknowledged some areas in which “Pittsburgh has joined the modern world,” it added that “National public opinion, not local public opinion” forced United States Steel to abolish the twelve-hour day for the half of its workers working on continuous processes. Detroit, in contrast, had “proved that ...civic freedom can flourish alongside of great private fortunes...that beauty need not flee the scene when factories
Recent artistic experiments did not appear to be a strong enough tonic to revive the geriatric city.

“What Kind of a Pittsburgh Is Detroit?” expected Pittsburgh to “gradually evolve into modern civilization – but slowly, because the iron hand of tradition grips it.” Pittsburgh, the article predicted, would become a Detroit, losing its distinctive identity, moved forward only by universal ideals, rather than by any distinctive powers of its own:

“. . . even Pittsburgh, mediaeval city that it is, cannot resist the pressure of the age, of the new ideal.” Yet the article regretted the likely passing of Pittsburgh’s unique character before it could be celebrated by homegrown artists, nourished by the inevitable modernizing civic revival:

A day may come when Pittsburgh will send forth an epic of industrialism – soot and smoke translated into life and beauty. Before that day comes the old Pittsburgh may be gone, with its traditions of grime and hustle, its reflections and reverberations of Hell, and in its geographical niche may be a new Pittsburgh, a city of leisure and beauty, where Beethoven has triumphed over John Knox, and were the children of mill-worker and millionaire together enjoy the harvest of dreams sown in bitterness and long deferred.

5A.4 “Child of Necessity and Nature”

The clearest expression in the 1920s of relations among the complex of issues at play in the contemplation of Pittsburgh’s future came in an article from the 1927 New York Times, one in a series the Times called “Our Changing Cities.” The article was entitled, “Fiery Pittsburgh” but its subtitle summed up the national image of the city in the 1920s: “A Child of Necessity and Nature, This Community of Furnaces and Smoke Is Now Stretching Its Arms Toward Civic Ideals, Aiming to Weld Beauty Into the Vast Industrial Machine.” The article’s author Robert Luther Duffus would later become a New York
Times staff writer. Duffus would write several articles (to be discussed below) both in the Times and in national magazines, about Pittsburgh and about the steel industry. He both reflected on and helped to define the national image of the city in these years. Duffus portrayed Pittsburgh as “child of nature and necessity” as unplanned, and contrasted it with utopias foreseen by William Penn and Robert Owen. According to the article: “Pittsburgh takes what the gods send it, be it coal, be it humanity and turns it to its own uses.” Despite the recent realization that a city might be intentionally shaped through reform and city planning, “Pittsburgh human and superhuman remains a child of nature.” Here nature stands not just for trees and rivers, but for what is given rather than chosen. Similarly, necessity stands both for economic necessity and for the non-teleological workings of physical laws – proceeding without regard to intelligent ends. Nature and necessity each rely on both of their meanings in the article and, used in parallel, lend connotations to one another. Nonetheless, the article identified successful and unsuccessful reform struggles with the New Pittsburgh which “must ascend” from the Old.31

The “old” Pittsburgh – to which discussion of the city’s smoke was an “essential....footnote” – held undeniable aesthetic and dramatic allure. Natural forces and materials harnessed in Pittsburgh’s industrial processes made the city a place whose “very rawness gives it marching life” and whose “crudities are vibrant with beauty.” The article claimed that although Pittsburgh “did not strive for loveliness – being sworn to the service of sterner gods – [it] yet managed to achieve it.” The article was illustrated by a painting of mills on the Allegheny by Aron Henry Gorson, just one of the American and international artists drawn in this period to interpret the Smoky City. “Fiery Pittsburgh”
called Pittsburgh smoke “the smoke of birth not of destruction.” It praised the city’s chimneys, which “pour out not black only, but also purple and red and vermillion,” as the “trees of the industrial area, glowing year round with an autumnal foliage.” Smokestacks became nature in Pittsburgh.

Yet, like the American Mercury article from the same year, “Fiery Pittsburgh” named the city a smoke-abatement success. It noted that Pittsburgh had “been enforcing anti-smoke ordinances for decades,” and claimed that most of the city’s remaining “mist” was due to natural weather conditions. Its coal and chemical emissions were “no thicker and blacker than [those of]... several other American industrial cities.” The article quoted Mellon Institute sources as claiming that “unnecessary fumes” had been reduced by 80% since 1913. Yet, it appreciated the ambiguity of these results saying: “What remains will eat the nails out of a slate roof; yet it seems to do no serious harm to lungs.” “Fiery Pittsburgh” pointed to sanguine medical statistics to draw conclusions about smoke and health: Pittsburgh had a low tuberculosis rate – further, Mellon researchers had already identified the disease as independent of smoke. The article failed to mention pneumonia, about which Mellon studies were ongoing, noting only that colds were common and that the overall death rate was only a little higher than the national average.

Though it identified Pittsburgh as the city of the given, the article announced its expectation of immanent urban transformation: “Pittsburgh, terrible and irresistible, is on the march – at the moment, you don’t doubt toward some great destiny.” It emphasized Pittsburgh’s far-flung financial connections, calling it “a national, an international ganglion,” ninth in population in the United states but sixth in bank clearings. The article
saw the United States and with it, even Pittsburgh, as glorying now not only in production – “tonnage” – but in the leisure made possible by production. It pointed particularly to the post-World War civic planning movement in Pittsburgh, though it remained skeptical about its prospects for success because of the minute division of the city in numerous separate municipal units. Smoke abatement represented change accomplished; city planning had already laid the groundwork for change expected. Incipient industrial decline embodied change endured. “Fiery Pittsburgh”’s last paragraphs mentioned factors that would become most significant in discussion and determination of the city’s future:

But perhaps Pittsburgh’s greatest opportunity is in its most imminent danger. With the decline in the production of bituminous coal in the Pittsburgh district the sceptre of steel will pass from it. Coal is the magnet that has heretofore drawn iron ore up the Ohio. But the bituminous output of Western Pennsylvania has been falling for some years, and before long the coal may have to seek the iron. In that case Pittsburgh will need all her skill experience and perfected organization if she is to grow and prosper. But out of such a situation may come a new civic consciousness, producing a more coherent, more cooperative community.32

If nature failed to confer permanent industrial advantage, intelligent human planning could direct Pittsburgh’s development to more worthy ends.

As should be apparent from this article’s conclusion, the uncertain future of the bituminous coal industry introduced a fundamental instability into discussions of Pittsburgh’s economic prospects. Worries about the decline of coal-based industries and about smoke as an impediment to industrial diversification had been linked since the 1890s. As concern about industrial survival linked to coal’s decline intensified, so did interest in this connection. Technical processes tied smoke abatement with new uses for bituminous coal, and ideologies of technology portrayed the chemical transmutation of
coal as a prerequisite for the establishment of the smoke-free White City. These interconnections became apparent in discussions of Pittsburgh’s future in the 1920s and developed further, in interaction with many of the cultural issues raised above, through the Renaissance of the 1950s. Smoke abatement and the transmutation of coal were central concerns in the planning Pittsburgh’s future.

5A.5 Smoke Abatement and the Future of Coal

Between the teens and the 1940s, talk about smoke in Pittsburgh alternated between claims of success and calls for control. On the eve of the First World War, many of Pittsburgh’s heavy industries had already improved combustion technologies in ways that reduced smoke. Local mills, for their own reasons, had converted from heavily polluting beehive coke ovens to waste-reclaiming by-product coke ovens, and the largest mills saved fuel by using automatic stokers. Pittsburgh’s smoke ordinance was expanded in 1917 to include the city’s mills only in the context of such accomplished facts. During World War I the federal government urged municipalities to lift restrictions on smoke out of concern that they might impede maximal industrial productivity. Pittsburgh’s smoke regulators resisted these urgings. Yet wartime shortages of cleaner grades of coal and of laborers skilled in the operation of smoke preventing technologies, combined with the difficulties of transporting coal for war production, caused them eventually to capitulate.

The period from World War I through the mid 1920s was marked by real and feared energy shortages. National energy demand increased during these years as total energy use expanded 2.7 times between 1900 and 1920 while population increased 1.4 times. Difficulties created by the demands of war production were exacerbated by coal
strikes and transportation inadequacies. In addition, experts were concerned about
depletion of national oil supplies. Pittsburgh experienced a shortage of natural gas.
During the war itself, the federal government had taken greater control of the nation’s
fuel supply and distribution than ever before. The end of World War I did not resolve fuel
difficulties. The coal industry was threatened in the postwar period by competition with
other fuels and by more efficient coal burning technologies, many of which also abated
smoke. In the 1920s and 1930s the coal industry suffered as production capacity far
outstripped demand and employers tried to compensate by cutting wages. Bituminous
miners struck in retaliation in 1919 and 1922 and anthracite miners struck in 1925-26.
Presidents Harding and Coolidge asked for power to seize control of the mines in
emergencies. The troubled coal industry was the subject of much investigation in the
period: an important sector of the economy suffering depression in the midst of the
booming economy of the 1920s. A number of commissions, studies, bills and hearings
attempted to address economic and labor problems in coal. R. B. Mellon, the original
donor for MISI, suggested to a 1925 senatorial commission that you couldn’t run a coal
mine without machine guns. After the strike of 1919, the government reimposed
wartime controls and after the strike of 1922 it came up with a new system of regulations.
Controls targeted prices, but did not deal with the more basic problem of production
levels, even after the re-imposition of greater regulation coming during the Great
Depression. The coal industry throughout the period resisted regulation of any kind.
Consumers complained of high prices, and coal’s share of the energy market declined.

In Pittsburgh, bituminous coal’s situation was more complex. Residential
consumers did not become heavily reliant on fuel oil or anthracite but were driven by
natural gas shortages to increased reliance on local bituminous coal. This situation was anomalous since natural gas was not as easily available to residents in most other areas of the country by this time. Nonetheless, in Pittsburgh, as in the rest of the nation, the difficulties of transporting coal for war production, and of coal strikes, turned the hopes of government, industries and cultural critics toward other fuels and toward greater efficiency in coal use.  

Discussion of completing fuel options was prominent in local newspaper articles celebrating or critiquing Pittsburgh’s smoke abatement progress. On July 15, 1920 the Pittsburgh Sun ran an article entitled “The War Against Smoke” on the occasion of the visit to Pittsburgh of Harrisburg’s mayor and council. The delegation from Pennsylvania’s capital city was visiting Pittsburgh to see how the formerly smoky city had dealt with the smoke nuisance – since Pittsburgh now had a “reputation as place that has made a good fight against the evil.” Yet the article complained that Pittsburgh was “not yet completely free of smoke” – “owing to war conditions from which we have not entirely recovered, the situation is not as satisfactory as it was several years ago.” Nonetheless, it celebrated, as many newspaper articles would in the 1920s, the fact that other cities, even New York (which had historically used anthracite) had as many smoky days as Pittsburgh according to United States Weather Bureau statistics. The article described the fuel shortages that threatened the country in the wake of the war. It also warned that if Pittsburgh buildings using natural gas converted to coal, as would soon be made necessary by fuel shortages, the city’s remaining smoke problem would be exacerbated. In the paper’s view the “gas supply [was] approaching exhaustion” and many people were set to get coal furnaces in the winter of 1920-21 since natural gas
supplies had run short in the winter of 1919-20. To deal with the threat of a more serious domestic smoke problem, the paper urged that the current smoke ordinance, which regulated steamboats, industry, locomotives, but not homes, be amended. The alternative, given the shortage of natural gas, was that people in residential sections would become as sooty as in former days and Pittsburgh would again be the “Smoky City.”

Despite increases in local bituminous-burning, the coal industry’s position as a declining sector of the national economy had local economic repercussions. Coal was no longer a supremely valuable production factor, key in determining industry location. By the 1920s younger steel cities, closer to iron mines and reservoirs of cheap labor, had already begun to eclipse Pittsburgh, just as other fuels threatened coal. The decline of coal shifted the foundations of the city built upon it. Pittsburgh-based scientific, technological, and economic studies of smoke, air pollution and the industrial future of coal were also attempts to work out the city’s relationship to the local natural resources that had justified its founding and phenomenal industrial development. The Mellon Institute smoke and air pollution studies were not the only significant enterprises of this character. The Mellon family would be centrally involved in other relevant efforts as well.

In 1926, Andrew Mellon, along with Iron and Steel Institute President (and former United States Steel and Bethlehem Steel CEO) Charles Schwab, and others, sponsored the “International Conference on Bituminous Coal” at the Carnegie Institute of Technology in Pittsburgh. The conference focused on “better” uses for soft coal including producer gas and by-product collection. The New York Times summary connected by-product collection to smoke abatement and public health. The conference
predicted “cities free from smoke” burning “prepared smokeless coal” or manufactured gas. C. J. Ramsburg, a Vice President of the Mellon-financed Koppers coke oven company argued against the “largely accepted” “idea that electricity would be used for heat and oust gas in a short time.” He argued that manufactured gas delivered heat much more efficiently than electricity, thus securing coal a permanent – though new and smokeless – place in future energy production. Delegates visited the largest by-product coking plant in the world at Clairton, Pa., just down the Monongahela from Pittsburgh, which employed 1,200 ovens, (with 300 more under construction) and produced both metallurgical coke and coal by-products. The Times ran a second long feature article, “Coal to Give Us Gasoline and A New Fuel,” based on information from the conference: “a thousand chemists and fuel engineers saw the future of coal unfolded....” The experts unanimously predicted “a day when burning raw coal will be regarded as highly extravagant,” when processed coal would be used in furnaces, and gasoline manufactured from coal for automobiles. Extravagance in accepted coal burning habits was tied not only to the acknowledged waste of heat in imperfect combustion but to the failure to reclaim “the contents of a drugstore, for bituminous coal contains the bases for hundreds of perfumes and medicines.” These predictions were expected to come to fruition fifteen or twenty years in the future in a new processed coal industry, which would sell “cakes of uniform solid heat” – a uniform black coal-based solid with “most of the chemically valuable constituents... removed.” This new fuel would “burn without smoke” so that the “air of London, Chicago, Pittsburgh and other cities notorious for the pall that hangs over them will be clarified.”
Making this fuel would involve a new coking process, “low temperature carbonization” in which more and different by-products could be collected and which would produce a fuel product much easier to burn than traditional coke. The new coke or “semi-coke” would be ideal for domestic use and could be combined with regular gas-plant by-product coke to produce a coke mixture with the properties necessary for iron smelting. “Half a dozen plants in the United States and a dozen in Europe” were already producing this processed coal fuel. American industrialists like Henry Ford were already investing in the industry. The only drawback was that there was not as yet a large enough industrial market for the by-products to make low temperature coking profitable.

Synthetic gasoline could provide the market. Several different gasoline alternatives could be obtained from processing coal: oil by-products from coking, liquified coal, or an oil formed by the combination of hydrogen and the manufactured gas now used for domestic heating (“water gas”). The most promising process by which it could be made from coal tar was, so far, expensive, however. The prospect of gasoline from abundant domestic coal was attractive because of worries about exhaustion of politically accessible oil supplies. In Germany two coal liquification factories were in operation and researchers competed fiercely with one another to develop the cheapest process for making a gasoline substitute.44

Discussion of smoke abatement, as suggested above, was an important part of the conference. Combustion engineers characterized efforts to improve domestic fuel burning for smoke abatement as failures and looked toward solution to the problem through the introduction of “fool-proof prepared smokeless fuel at a price no higher or but a little higher than the price of coal today.” Important national smoke abatement officials, such
as O. P. Hood, chief mechanical engineer of the United States Bureau of Mines; Osborne Monnett, consulting engineer of the city of Chicago; and H. C. Porter, consulting engineer of the city of Philadelphia agreed that prepared smokeless coal would make the major contribution to solving the domestic smoke problem. Chicago smoke control engineers urged the importance of further smoke abatement in large industrial plants such as iron and steel mills, in which, “the opportunity existed for substantial fuel savings especially by more efficient and more complete use of surplus gases and waste heat.”

This conference also included sessions on improving coal mine safety. So — technological development of new uses for coal, elimination of coal’s negative environmental effects and betterment of the lives of coal miners were all part of the cluster of issues to be addressed in hope of improving the outlook for the bituminous industry.

5A.6 Smoke Abatement After the Great War: Herbert Meller as City Official and Pollution Scientist

Pittsburgh’s smoke abatement claims and conflicts were a central component of a larger public discourse expressing the city’s hopes and fears for the future in terms of its relationship to coal — and through coal to industry, labor, technology, nature, and the progress of history. As Pittsburgh struggled with threats to its industries built on local natural abundance and writers claimed contradictory relations between nature and the city’s decline, those interested in smoke abatement cast the historical discontinuity in a positive light. They claimed that the city had already been remade through their own efforts.
In 1920, The Pittsburgh Sun praised former city smoke inspector William E. Porter on the occasion of his death. Porter had “put Pittsburgh to the front of this movement during the last few years, not permitting the war to cause complete relaxation in this matter, as it did in Chicago and a number of other cities.” According to this article, to call Pittsburgh the “smoky city” now was to “libel” it. Thanks to Porter Pittsburgh was now less troubled by smoke than “several municipalities which have never been thought of as particularly afflicted in this respect.” Weather Bureau statistics proved Pittsburgh’s progress: “even” New York City, according to the United States Weather Bureau, had “fewer clear days in 1918 than Pittsburgh.”

Claims of success found a receptive audience. In the 1920s, it was less politically contentious to oppose smoke than it had been at any previous time in Pittsburgh history. To oppose smoke was no longer to oppose industry, since visible smoke, even from metallurgical furnaces had been regulated by the 1914 ordinance and many industries had installed economically attractive new technologies that also abated smoke. The mills, in these years, were portrayed as setting a good example for domestic consumers – at least in terms of the reduction of visible smoke. As the mills got cleaner, domestic chimneys increased their smoke output. Pittsburgh’s residential fuel market had been dominated by natural gas into the early 1920s. Yet between 1922 and 1924, local supplies of natural gas ran short and domestic users turned again to bituminous coal. Indeed, throughout the 1920s, the visibility of domestic smoke rose because of natural gas shortages and a resultant shift back to bituminous coal among domestic consumers.

As this discussion should make clear, however, Pittsburgh’s emissions patterns were in a constant state of flux due to changing costs and availability of competing fuels,
changing technologies, and shifting industrial geography. Scientific and technical constructions of what smoke was and of the best means of controlling it were similarly fluid. The same article that had posthumously praised Porter’s accomplishments announced that the dean of the University of Pittsburgh’s School of Mines, forty-two-year-old Herbert Meller, would become the new head of Pittsburgh’s Bureau of Smoke Regulation (under the Department of Public Health). Meller, born in Altoona, Pa. and educated at the University of Pennsylvania, the Michigan College of Mines and the University of Pittsburgh, had begun teaching “mining subjects” at the University of Pittsburgh in 1910. Meller would continue to serve as dean of the School of Mines for several years after his appointment as city smoke inspector.\textsuperscript{50} While enthusiastic about progress to date, the 1920 \textit{Sun} article looked for even more improvements from Meller. It saw him as someone long familiar with the smoke problem, an engineer with excellent academic credentials, but also as one who knew the “most practical” ways to handle the smoke nuisance.\textsuperscript{51}

Meller would become the central figure in efforts to investigate, define and regulate Pittsburgh’s air pollution in the 1920s and 1930s, eventually heading a new round of scientific studies of smoke at Mellon Institute. In Meller’s ongoing work, as in previous Mellon investigations, science as a weapon of smoke control proved to be a double-edged sword. Installation of a prominent mining engineer as city smoke inspector and as head of Mellon air pollution investigations, placed multiple questions about the city’s relationship to bituminous coal at the center of efforts to address its smoke problem. Scientific investigation of smoke played an important rhetorical role in an ideology of civic, industrial and civilizational progress. Yet, both in its content and in the
practical arrangements into which it necessarily entered to sustain its activity, scientific
study of air pollution was a diversion from such “progressive” trajectories. The
development of Herbert Meller’s career over these decades, embodied the complex
relations of science to environmental and civic progress.

Meller began his career as smoke inspector as an enthusiastic promoter of
Pittsburgh’s smoke abatement accomplishments. On January 29, 1923, the Pittsburgh
Chronicle Telegraph announced: “Smoke Bureau Has Been Successful – Miller [sic]
Says Department Has Reduced Smoke 80 Per Cent Since 1914 – Few Violations Are Seen.” He promoted a cooperative policy of dealing with industrial violators. Prosecution
was now not as necessary as it had been in the past, since notification alone now elicited cooperation, and many corporations had hired special smoke abatement employees.
Meller had undertaken no prosecutions in 1922 and claimed that hundreds of violations had been eliminated through notification.\(^{52}\) While Meller complained that outlying industrial plants along the rivers now gave Pittsburgh their smoke, he praised cooperation within city limits. Nonetheless, Meller, when faced with the suggestion that the Bureau had made itself obsolete, since all concerned now had smoke abatement equipment, responded by saying that “such action would soon place Pittsburgh in the class of a smoky city of old” – in less than six months.\(^{53}\)

In 1923, Meller would become head of a new round of smoke investigations at Mellon Institute. To take on this new job, he would retain his position as city smoke inspector but resign his post as dean of the University of Pittsburgh’s School of Mines.\(^{54}\) Despite Pittsburgh’s success, the Mellon Institute believed that there was still work to do and that work was to be based on an extension of the original Mellon Institute Smoke
Investigation. The institute would investigate smoke abatement on a national scale and conduct “systematic surveys of smoke conditions in Pittsburgh, Chicago, Cleveland and other cities.” Meller was to explore technological solutions like electrostatic precipitation and to investigate smokeless fuel manufacture, the matter that would be so prominent at the 1926 Mellon-sponsored conference on the future of bituminous coal (discussed above). The air pollution investigations would fall under a new industrial fellowship at the institute, endowed independently of MISI.55

5A.7 The 1923-24 Sootfall Study: Ambiguous Results

Meller’s views about smoke abatement progress underwent piecemeal revision during his years as a Mellon air pollution investigator. The difficulties of defining and measuring air pollution were related to Pittsburgh’s changing energy economy and to its changing industrial position in comparison to that of other urban areas. Early on, Meller’s shifting views of the importance of domestic smoke exposed the tenuous nature of confident claims of smoke reduction. Such claims were always subject to revision due both to scientific uncertainty about the proper measurement and definition of smoke and to change in the sources and character of stack emissions. The existing ordinance did not cover residential smoke, but Meller, in January 1923, on the basis of his experience as smoke inspector, had claimed that domestic smoke was not a serious problem in Pittsburgh: “We have found few violations in the residential districts.”56 Yet later in 1923 Meller would identify domestic smoke as the city’s chief remaining source of visible smoke. In the same year, prompted by the natural gas shortage, researchers at Mellon Institute undertook new work aimed at cleaning up domestic smoke. As noted above,
Meller also blamed smoke producers outside the city limits (including mills) for much of Pittsburgh’s remaining smoke problem. Neither the city itself nor its emblematic mills were any more to blame for its emblematic problem. This was, in one way, a mark of smoke abatement success.

Claims of success continued through the 1920s in the face of ambiguous scientific results emerging from Mellon Institute. In 1923-24 the Institute published results of its second soot-fall study. Celebrated by Edward Weidlein, the Institute’s director, as evidence of the efficacy of Mellon’s scientific leadership in smoke abatement, the study reported a significant decrease in the amount of tar deposited. Tar was quickly interpreted as the single component representing visible smoke, and its reduction was taken to show that the ordinance had worked. On the basis of these new tar results, newspapers and Mellon Institute spokespeople claimed that 75% of Pittsburgh’s visible smoke had been eliminated since 1912-13. By this criterion, the ordinance was working well. The total weight of all particulates deposited, however, exceeded the level identified in the 1912-13 soot-fall study. Both the increase in total solids and the persistence of complaints during the ten year period between the soot-fall studies pointed to a continuing problem. Meller pointed out that ash was a major subject of public complaint and that it was as yet unregulated. Smoke abatement technologies adopted in the wake of initial Mellon surveys actually contributed to the ash problem. To increase the likelihood of complete combustion, Mellon Institute and the smoke inspector’s office had urged the introduction of more air into furnaces, yet the resulting higher wind velocities carried particulate matter up the chimney that, in a lower draft situation, would have remained in the furnace. The ambiguous results of the 1923-24 study proved to be a
flexible tool in the hands both of those who wanted to celebrate Pittsburgh’s success in smoke abatement and those who were troubled by its persistent failures.  

Soot-fall study results were not only ambiguous when examined in comparison to the earlier situation in Pittsburgh, but also in comparison to contemporaneous results from London. Researchers at Mellon had conducted the 1923-24 study in the hope of comparing results both with those obtained by MISI in 1912-13 and with continuous soot-fall records that had been accumulated in London over the previous five years. Pittsburgh’s total solid deposit for 1923-24 was much higher than London’s in 1914, yet London had shown little improvement over the previous decade while Pittsburgh’s tar deposit had been significantly reduced. Mellon researchers argued that to be fair to Pittsburgh a comparison should be made to a British industrial city rather than to an administrative and business center like London. Still, despite Mellon researchers’ interest in using the difficult truths of the soot-fall study to re-focus their research and redouble their efforts to control the many components of pollution, they were also eager to shore up the claims of comparative progress that had become commonplace during the preceding years.  

The 1923-24 results led smoke abatement authorities like Herbert Meller to broaden their focus beyond visible smoke to the more general problem of air pollution. This new orientation ultimately pointed toward more comprehensive and rigorous control of the urban environment than Pittsburghers had ever contemplated before. The development of this new orientation was aided by a careful re-examination, newly underway at Mellon Institute, of methods previously used in the scientific study of smoke. Sootfall studies had long been the bulwark of smoke research at Mellon Institute.
After the 1923-24 study, Mellon researchers began both to examine the method of soot-fall study critically and to look beyond it. They complained of the discrepancy between pollution regulated and pollution measured: while soot-fall studies looked at all solid deposits, smoke ordinances regulated only dense smoke. After the 1923-24 study, Mellon investigators began to turn their attention away from visible smoke and toward the broader problem of air pollution – particulate and gaseous, visible and invisible. They took up the task of correlating various measures of air pollution but were in reality operationally defining air pollution itself. Meller was interested in understanding the nature of the many components of pollution in order eventually to regulate them. Nonetheless, he asserted in 1924 that it was not yet technologically feasible to prohibit all visible smoke, much less to regulate all invisible emissions.

The adequacy of the current ordinance was, however, clearly at issue in the mid and late 1920s. Meller searched for sources of smoke not governed by the ordinance, for which improved control was already technologically feasible. He also, legitimately, tried to force municipalities outside of the city limits to share the blame for smoke, even though the relatively light suspended particles that outlying areas could contribute to Pittsburgh’s pollution load could not have been measured as soot-fall. In 1925 he called for the formation of a “metropolitan smoke district” encompassing all those municipalities whose emissions contributed to the pall hanging over Pittsburgh. In addition, due to the recent replacement of natural gas by bituminous coal in home heating, he urged in 1926, that the ordinance be modified to regulate it.

While seeking to broaden legal control where technologically possible, Meller chafed against the demands placed on smoke inspectors to eliminate all air pollution,
when many of its kinds and sources were not regulated by current ordinances. In spite of Meller’s efforts and of the persistent claims of progress, in 1926 the Pittsburgh City Council called on Meller’s bureau for more aggressive action against smoke. In this way, Meller found himself in the position of previous smoke inspectors, who had, ironically, been criticized, for inadequate enforcement, mainly by Mellon Institute investigators. Again, in 1928, in the face of inefficient operation of plants due to an industrial slow down, city council members complained about increased pollution. Smoke and prosperity were decoupled in such circumstances. According to Meller, these complaints focused on the kinds of pollution unregulated by the ordinance: chiefly smog due to winter domestic heating, pollution from mills outside the municipality and railroad cinder. Meller complained in 1929 that smoke inspectors were ignored in good times and blamed for the weather in bad. Meller was pleased with the progress in industry and proud that his office had secured industrial cooperation without driving a single plant from the city. In the midst of this period of complaint, claims of progress were continually reasserted. In January 1929 the Pittsburgh Chamber of Commerce praised Meller and put forward his view that the ordinance was not ready to be made stricter because of lack of technology.

Despite moves to justify some of the limitations of existing smoke regulations, all of Meller’s scientific energies were focused on identifying and publicizing the broader problem of air pollution. In March 1929, Meller urged work on the problems of gases and total solids, but again advised that no new regulations could be put in place that would rely on equipment not already on the market. Meller persisted in this view for several more years – explicitly reiterating it in 1930. Meller advised that the city should revise
ordinances as soon as good affordable equipment was available. And while work on pollution measurement would become the most important focus at Mellon, researchers there did not ignore the problem of improving air pollution control technology: in 1929 when Mellon Institute received a new donation for smoke abatement work, Meller believed it could be best used for research on a small stoker for dwellings.65

At Mellon Institute during the 1920s attention turned from smoke to the more general phenomenon investigators had begun to call “air pollution.”66 In these early years, researchers believed that technology was still not good enough to require that existing city ordinances be modified to reflect new understandings of the problem. Despite his new scientific focus on invisible pollution, Meller energetically urged that city regulations be expanded to include visible smoke from Pittsburgh’s domestic furnaces and from outlying industrial plants. With these shifts of attention, Meller effectively asserted that he had industrial smoke within city limits well under control. The investigation would later consider the health effects of this new “air pollution.”

5A.8 Claims of Comparative Success

Criticism of Pittsburgh’s air by civic authorities and refinement of research strategies at Mellon to handle inadequately addressed pollution problems proceeded alongside the promulgation of claims of Pittsburgh’s smoke abatement success. Local activists and officials had claimed success in Pittsburgh since smoke inspectors began their operations in the 1890s. In both 1915, and 1917, for instance, smoke inspector Henderson had been able, using United States Weather Bureau “Smoky Day” statistics, to claim striking progress in smoke abatement, with smoky days more than halved since 1912, despite
continuing rapid increases in the amount of bituminous coal burned in Pittsburgh. As we have seen in several articles from the national press above, acknowledgment of improvements in Pittsburgh’s air was widespread the 1920s. “Pittsburgh Model of Spotlessness” in the Pittsburgh Gazette Times of December 1922, quoted the Cleveland Plain Dealer as recognizing Pittsburgh’s 80% reduction in smoke and as proclaiming to its readers “What Pittsburgh has done Cleveland intends to do.” Ambiguous results of local soot-fall studies were also used to claim improvement: “King Smoke Losing Grip on Pittsburgh, Research Reveals – Tar Content Removal Is Great, Inquiry Shows – City’s Record Beats London,” from the October 1, 1924 Pittsburgh Post, ranked London as a smokier city than Pittsburgh. Literary Digest in April 1927 reported that St. Louis was dirtier than Pittsburgh. Such claims to improvement, however, were purely comparative: they depended at least as much on declines in air quality in other cities as on real improvements in Pittsburgh. In addition, many of them depended on the very ambiguities of pollution measurement that Mellon researchers were setting out to resolve.

Other cities worked out their own pollution problems with reference to Pittsburgh’s experience and through explicit reliance on the expertise developed there. New York City, long contrasted to Pittsburgh as clean and cultured, partaking in none of Pittsburgh’s frontier industrialism (and providing a home away from home to its millionaires) was a case in point. In the early 1920s, New York City faced the crisis of an anthracite strike and increasing use of bituminous coal. Articles in the New York Times warned of the growing smoke threat, frequently adverting to Pittsburgh’s experience in such matters. One article began with a reference to an O. Henry story in which a character born in Pittsburgh first saw the light of day at the age of 5, when his parents
moved to New York City. “Unless the present use of soft coal is checked,” it continued, “New York and Pittsburgh may stand in the same relation as the pot and the kettle.”71 The New York Times even carried an ad for Pond’s vanishing cream that claimed to protect wearers’ skin against the kind of smoke damage common in bituminous cities such as Manchester and Pittsburgh.72 Anthracite shortages and the resulting bituminous coal smoke remained a problem for New York City throughout the 1920s.73 New York’s concern with air pollution problems is evident in a number of articles published throughout the decade.74

Pittsburgh simultaneously retained its position as “kettle” and took on the role of shining example of smoke abatement success.75 A New York Times letter writer in May 1924 warned readers that unless the burning of both soft coal and fuel oil were stopped, New York, “formerly renowned for its pure and healthful atmosphere” would become so polluted that “as in Pittsburgh, a clear sky will be seen about once a month.”76 Several days later, the Times printed a response from another reader. The second letter proclaimed Pittsburgh’s progress and urged “adopting the Western methods” of the bituminous cities on the other side of the Alleghenies. According to this letter-writer, with “a very efficient Bureau of Smoke regulation, backed by drastic laws, Pittsburgh, once described as ‘hell with the lid off’ has become one of the cleanest cities in the country – far more so than New York City today.”77 Another anthracite strike during the winter of 1925-26 further increased soft-coal burning in New York.78 By 1926 and 1927, New York City claimed to be vigorously fighting smoke.79 In most articles Pittsburgh served as New York’s smoke control inspiration.80 Yet a letter to the editor in the New York Times headed “Caution in Smoke Control” from December 1927 counseled against
drastic action against smoke in New York, arguing that Pittsburgh’s smoke was still ten or twenty times as bad as smoke in New York City. By April 1928 the New York Times proclaimed that a new study by the National Conference Board of Sanitation had surveyed cities from the Atlantic Seaboard to St. Louis and found “...More Soot Here Than In Pittsburgh.” The report relied on Pittsburgh expertise to justify smoke abatement, citing Mellon work on the costs of smoke damage as a chief reason to control smoke. The Pittsburgh Sun-Telegraph, of course, picked up this story. The October 1927 New York Times had also reported that Pittsburgh was less smoky than London, but letters to the editor of the New York Times disputed New York’s status as the smokier city. In February 1929 the New York Times ran a very brief piece summarizing a Mellon Institute pamphlet on damage due to smoke entitled “Authority of Experience.” The article concluded: “Pittsburgh ought to know. It had a smoke problem of its own once. In Pittsburgh, claims to success and complaints about smoke continued to alternate. In 1928, the same year the National Civic Sanitation Board Survey had concluded that Pittsburgh was no longer the smokiest city, local newspaper articles complained of Pittsburgh’s backsliding. As noted above, the papers blamed inefficient use of fuel due to an industrial slowdown and unregulated cinder from railroads. While a 1929 study showed that Pittsburgh air carried the same load of suspended solids as the air in New York City, newspapers still could publish damning articles about Pittsburgh smoke. Yet, now, according even to critical local papers, Pittsburgh was not alone in its smoke. According to the study, Chicago and St. Louis had worse atmospheres; New York City was not as bad. Further claims to success were supported by the ambiguities of measurement. These results depended on measurements of total solids gathered through
soot-fall measurements, rather than counts of suspended solids as had earlier comparisons with New York.88

The contradictory claims of success and lack of progress were possible in part because of the many different means of measuring air pollution employed in these years. Researchers at the Mellon Institute were well aware of these ambiguities and, from 1923 on, they attempted to evaluate the accuracy of various means of measuring pollution. The new work attempted to correlate variations in soot-fall with factors independent of pollution emissions that might influence it, such as prevailing winds, as well as with components of the weather that one would expect to be influenced by smoke such as fog and visibility conditions. This work also sought to determine the proportions of soot-fall from domestic and industrial fires, and ordinance-violating stacks versus ordinance-compliant stacks. By 1929 workers at Mellon had made progress in correlating various types of pollution measurement. They weighed precipitated solids samples, exposed oxalic acid to solar radiation to observe its rate of decomposition and counted suspended solids using a photo-electric cell to measure light obstruction. They also measured the amount of ultraviolet light received in the city, a part of the spectrum they knew to be significantly blocked by pollution.89 Correlation of measurements would create more reliable means of assessing abatement and comparing urban pollution. Measurement technologies also had the power to define what would count as air pollution. In the case of sootfall, measurement ambiguities led to an enlargement of the definition of air pollution. Measurement correlation was an ambitious research program, however, and as such would not fare well as funding ran short in the coming depression.
Mellon research spanned the divide created by the stock market crash. Yet, both outcomes of research already in progress and social and economic factors rooted in the Depression would shape continuing research. The most significant piece of ongoing research at Mellon Institute in 1929-30 was a third soot-fall study. As in the 1923-24 study, results were ambiguous – this time decreased total solids and increased tar. Mellon Institute’s director Edward Weidlein announced in local newspapers that Pittsburgh’s air was cleaner, based upon the reduction in the deposit of total solids from that measured in the 1923-24 study. Yet total solids were still higher than in 1912-13.90

Herbert Meller de-emphasized the total soot-fall result in articles he wrote and talks he gave about the study. Meller disaggregated the results, preferring to talk about results at each soot-fall collection station independently and to focus on changes in each component of the deposit individually. In order not to appear disingenuous, Meller, the city’s smoke inspector, could not emphasize total solids and ignore tar, the component of soot-fall taken in the earlier study to be the mark of visible smoke. He concluded, however, that the increase in tar must have come from non-stack sources.91 His work in the 1930s would follow this course. For example, in the summer of 1932 Mellon Institute inaugurated tests of air in locations with a high density of auto emissions in order to examine non-stack and non-coal-generated sources of the city’s remaining air pollution problem.92 Research on non-stack sources of pollution changed the focus of Mellon air pollution research to investigation of aspects of Pittsburgh’s characteristic problem that were less characteristic of Pittsburgh. It went beyond earlier Mellon attempts to apply universal science to Pittsburgh’s unique environment. Instead it hoped to explain
Pittsburgh’s air pollution with reference to pollution sources present in many cities. This new focus also reflected the weakening association of Pittsburgh with bituminous coal.

In the aftermath of the 1929-1930 study, Meller questioned the assumption that stacks were the major source of pollution. Yet the historical importance of stack pollution in Pittsburgh led him also to examine the reliability of the measurement technology that had drawn him away from the smokestack focus. In 1930 Meller spoke explicitly of the limitations of soot-fall as a measurement of air pollution. Since soot-fall varied with the weather, Meller took sun obstruction to be the more accurate measure. Researchers sought to correlate variations in soot-fall deposit with Weather Bureau data, not so much to measure visibility obstruction by smoke, as to find patterns that could give them information about ways in which weather influenced soot-fall. By June of 1930 Meller had begun to turn away from soot-fall to other work: flue gas analysis, ultra-violet light measurement, and automatic measurement of light obstruction with photo-electric cells both within in furnaces and over long distances outdoors. Meller was keenly aware, at this point, of the limitations of soot-fall as the main measure of air pollution.$^93$

Throughout the 1930s work at Mellon continued on isolating the various factors other than pollution emissions themselves that could account for variations in soot-fall readings. Researchers nationwide were also cognizant of these problems. A report of a 1931-33 study of soot-fall in multiple cities conducted by the United States Public Health Service noted various problems with the comparative use of soot-fall statistics to determine relative pollution levels. The report lamented that given variations in the proximity of collection points to pollution sources, and the differing effects of the Depression on industry in different cities, results from the multi-city study could not
serve as the basis for reliable comparisons of stable pollution levels among American cities.  

Despite complexities introduced by scientific work intended to clarify, simple and straightforward claims of Pittsburgh’s smoke abatement success continued. In 1934 Pittsburgh newspapers reported that natural gas executive Henry Obermeyer’s book did justice to Pittsburgh’s successful smoke abatement efforts. *Stop That Smoke*’s chapter “Progress in Pittsburgh,” pointed out that many cities were now more polluted than the one most widely known for its smoke. A 1936 Pittsburgh Public Health Department Survey, again based on the same Mellon Institute data, reported a 75% reduction in illegal smoke since 1912. Pittsburgh’s smoke and its claimed smoke abatement progress acquired enriched meaning as Pittsburgh became a national symbol of both the causes and the effects of the Depression itself.

### 5B The Great Depression

Pittsburgh was hit harder by the Great Depression than almost any other American city. Yet it retained, and in fact, strengthened, its status as a national symbol of the grandeur of American industry. At the same time, both national and local scholars and writers saw the city as more advanced along a trajectory of industrial decline than other cities. Fears for the nation’s economic future were focused on Pittsburgh, both because of its history as America’s industrial capital and because of its heightened economic vulnerability due to the dominance of a few heavy industries.

Multiple visions were advanced of Pittsburgh’s rescue from the Depression emergency. Some looked to the city’s longstanding special relationship with nature, and
the uniquely industrious population this relationship had created, to bring recovery. Others saw organized labor itself and a coming industrial democracy as the solution. Still others imagined that thoroughgoing technological change would transform not just the city’s industry and economy but also its culture and the kind of civilization it embodied. Questions about the future of the coal industry and about smoke would function in different ways in each of these visions of recovery.

5B.1 Pittsburgh in Depression: Smoke, Steel and Squalor in the National Press

During the Great Depression Pittsburgh was the American industrial system’s most vulnerable point. The national press nervously watched the city. Local writers articulated poignant longings for recovery of what had been lost. Local economists warned the nation that the trajectory marked out by Pittsburgh would apply to other cities. In an intellectual context eager to identify economic trends, and so to chart a course beyond the present, Pittsburgh was both a microcosm of the present emergency and a frightful harbinger of things to come. As we have seen in reports of increased smoke due to industrial slowdown on the eve of the Great Depression, industrial malaise was already evident in the Smoky City. The Depression increased national interest in the city and articles published in the period of economic difficulty leading up to the stock market crash of October 29, 1929 already reflected this fact. While an American City report that Pittsburgh had established a tourist bureau celebrated change accomplished, most articles published throughout the decade would be stories either of change endured or of redemptive transformation yet to come.
In October 1929 Ladies Home Journal published a descriptive article about Pittsburgh, illustrated by nine pastel-tinted sketches. It was the last national article to sound the hopeful themes of the 1920s. While it acknowledged looming industrial threats, it sanguinely dismissed them. The article contrasted Pittsburgh’s historically narrow focus on production with new attention to aesthetics and quality of life. Ladies’ Home Journal complained that Pittsburgh had “pinned her faith to tonnage and let nearly all else go by...until rolling clouds of smoke hid the sun by day and at night pillars of flame reddened the skies.” Yet the article referred to Pittsburgh’s Oakland Civic Center as the “Acropolis of America.” Both blast furnaces and the Oakland Acropolis were sketched in hues completely incompatible with the sooty tones of the city itself. A section entitled “A Yen For Beauty” claimed that Pittsburgh’s “definite advancement along cultural lines” would be apparent to “even the most casual visitor” in its symphony, in the Carnegie International art exhibition, and in urban reforestation among the “smart shops” of the Golden Triangle. The residence of steelmasters in eastern cities during the previous two decades had been a catalyst for cultural change. In cities like New York they “came in contact with new friends who diplomatically conveyed to them the idea that the world had come to think of Pittsburgh as a mass of dark sinister machinery whereby money was made.”

Pittsburgh had augmented its industrial greatness with artistic achievement, but it had also endured economic fluctuations by welcoming modernization. Its receptivity to technological change was tied to its historic strengths.

But old ideas change, and even steel will yield but give it time. A new day is dawning in Pittsburgh – is already here for that matter. Steel? Oh yes. More than
ever. Tonnage? To be sure. Tonnage that would have made those old iron masters of an earlier day green with envy.... 

Pittsburgh’s characteristic technological innovativeness had led to mechanization in coal mining and electrification in steel-making, transforming labor relations and relations with local nature. The article acknowledged that innovation in Pittsburgh was now being employed as a response to industrial threats:

Scientific and technical skill has worked wonders since Pittsburgh’s supremacy in steel was challenged a few years ago.... Glass and electrical manufacturers likewise were helped by research workers. King Coal, for a time a sick monarch, has called in the same doctors.

Coal’s attending physicians prescribed coal liquification to make gasoline as a remedy for the ailing king; steel and railroads had recently re-invested. Pittsburgh was the “City of Steel and Stamina” who “faces all of her problems courageously” and had “hitherto...emerged from every difficulty with the same apparent ease with which she casts aside her occasional blanket of smog– smoke and fog. The wind rises and blows away the smog. The city’s spirits rise and dispel the imps of doubt and depression. Never for long is the city overcast or downcast.”

Black Tuesday was yet to come.

It is easy to see Pittsburgh in national context during the Depression by looking at contemporary articles from the New York Times. In a review of the 1930 census, R. L. Duffus discussed Pittsburgh alongside other American cities. “Our Cities in a Census Mirror” described “a remarkable shifting in the nation’s growing points.” It described New York’s growth curve “already beginning to flatten,” Philadelphia, Boston, and Baltimore as “serenely established in old traditions” and Chicago as a “precocious.....child of a miraculous hundred years.” Against this background, and in contrast with the growing cities of Detroit and Los Angeles, Pittsburgh was described as
“passionate, individualistic and ambitious, yet fearful of losing her power to the cities of the lake and plain.” The article did not place similar industrial cities like Cleveland or St. Louis in such a precarious position. It expressed none of the confidence demonstrated by Ladies’ Home Journal in Pittsburgh’s unique ability to cast aside economic bad air. The Times, in fact, unfavorably compared Pittsburgh with Cleveland. While Cleveland was smoothing its rough edges, “Pittsburgh still glories in a kind of native rawness.” Where Cleveland was confident “Pittsburgh struggles, fears and hopes.” Cleveland “anoint[ed] herself for tomorrow” while Pittsburgh “where the smoke and flame ...going up to heaven in a strange beauty, already smell of the rude past.” Cleveland had “calmly, deliberately and thriftily utilized every natural advantage” yet, rather than letting its industrial character be simply determined by nature, it “reach[ed] out cooperatively for new industries, the more and the more diversified the better.” According to the Times, through civic cooperation, economic diversification, and adequate attention to cultural amenities “the future of Cleveland ...[was] assured.” In contrast, “Pittsburgh at the union of her rivers, was an ideal location for an industrial city a generation or two generations ago.” The article even argued that “a boy setting out to be a millionaire” in coal and iron might now do so more easily in Cleveland. Yet the article added that he might not make them as “adventurously”: “For the attribute of Pittsburgh is adventure – adventure of a kind hard to endure but exhilarating for these whose fibers are tough enough.”

This article, like those of the 1920s, highlighted Pittsburgh’s special relation to nature, its industrial beauty and its energy. It emphasized a theme that would become increasingly common in the 1930s: Pittsburgh was an old city, passé, behind the times. This view of Pittsburgh contrasts with images of the city as a new frontier settlement and
as a bold industrial experiment, which had dominated popular presentations of Pittsburgh throughout the nineteenth century. Yet elements of frontier rhetoric – boldness, courage, primitiveness, adventure, and the special relationship to nature – persisted even in articles that discussed Pittsburgh’s senescence. These seemingly contradictory themes would jostle with one another throughout the 1930s. They would provide the language used to work out Pittsburgh’s contested future.

Through the early 1930s several other significant articles appeared in the national press about Pittsburgh. They combined themes of Pittsburgh’s Depression struggles, criticism of its longstanding social difficulties and celebration of its strengths as the material from which a national recovery would be built. The sense of Pittsburgh as a problem to be solved and as ripe for change is common in sources from the period. A 1930 Harpers’ article, “Is Pittsburgh Civilized?” (also by Duffus, now a New York Times feature writer) scathingly criticized Pittsburgh’s social structure and looked toward ethnic and religious transition to remake the city. Duffus lamented that “civilization rests on iron and coal but where iron and coal are processed there is blight.” According to the article Pittsburgh’s main problem was domination by an irresponsible hereditary elite: a Scotch-Irish Presbyterian cadre hand-picked by the Mellons. Where Ladies’ Home Journal saw steelmasters awakened to their city’s shortcomings and employing technology, planning and patronage to set things right, “Is Pittsburgh Civilized?” characterized this group as without social conscience and as taking a purely instrumentalist view of the city. It argued that Pittsburgh’s elites, for instance, would not bring about the economic diversification needed to stave off the city’s industrial decline because they were doing well enough as things were. The article characterized the city’s
impressive efforts in industrial research – including those focused on smoke abatement –
as exercises in improving these elites’ capacity to extract profit from the city without a
thought for its intrinsic good.\textsuperscript{105} It took smoke abatement as a diversion from the city’s
real problems. It mentioned the city’s elimination of \(\frac{4}{5}\) of its smoke through industrial
research but said that “the smoke that blinds men’s eyes to beauty is another matter.”
Rather than celebrating recent efforts in art and art patronage in the city, as \textit{Ladies’ Home
Journal} had done, the article complained of the absence of artistic excellence.\textsuperscript{106} Both
articles identified the threat of industrial decline. While \textit{Ladies’ Home Journal} looked to
Pittsburgh’s technological adaptiveness to save the city, “Is Pittsburgh Civilized?”
predicted that Pittsburgh would survive because of the power of local nature and of the
new ethnics who would replace Scotch-Irish Calvinists as the city’s leaders. The article
proclaimed, the “Presbyterian Block is not Pittsburgh.”\textsuperscript{107}

\textbf{5B.2 The Mellon Machine and the CIO}

The Mellon political machine was a powerful force in Pittsburgh and Pennsylvania
politics in the 1920s and 1930s. Andrew Mellon and his nephew Gulf Oil President
William Larimer Mellon struggled to keep control of state political offices away from
Progressive Republicans. Andrew Mellon’s arch-enemy Pennsylvania Governor Gifford
Pinchot denounced “the Mellon machine in Pittsburgh” in his last message to the
Pennsylvania legislature in January 1927. Pinchot characterized the Mellons as allied
with organized crime and liquor interests (they had held distillery stock) and as
compelling local businessmen to do their bidding by wielding their financial power.\textsuperscript{108} In
the early 1930s the theme of Mellon domination of Pittsburgh appeared repeatedly in the
national press. In 1931 The Nation reported early evidence of the sort of political upheaval hoped for by Harper’s. “Mellonism Takes the Count: Allegheny County” discussed the loss by machine Republicans to Pinchotites in local elections, much to the Mellon’s displeasure, and the alliance between regular (non-Pinchotite) Republicans such as the Mellons and Democrat David Lawrence, chosen by the Republicans to run for county commissioner.109

The regressive tax policies promoted by Andrew Mellon as Treasury Secretary under Harding, Coolidge and Hoover had made him unpopular with workers struggling through the depression. Pittsburgher and union newspaper man Harvey O’Connor attacked Andrew Mellon in his 1933 biography Mellon’s Millions.110 Meanwhile, the national visibility of the Mellons continued with multiple articles about Mellon Institute, Mellon art collecting, and the Mellon-funded Presbyterian Church in East Liberty, called by some the “Mellon Fire-Escape.”111 In an article about the dedication of the new four-million-dollar Presbyterian cathedral, Richard B. Mellon was quoted as saying in 1931 that the family’s funding of the church was to “to reassure those who fear the country is doomed to become engulfed in materialism.”112 One article noted that this sum was more than was spent by Allegheny County on poor relief in 1931.113

Infighting within the Republican party, combined with the appeal of Roosevelt’s promise of a New Deal, broke the long tradition of Republican electoral domination in Pittsburgh. Roosevelt carried Pittsburgh in 1932 and the Democrats won the municipal elections of 1933.114

Electoral reorientation was not the only threat to Mellon domination of the city in the 1930s. As predicted in, “Is Pittsburgh Civilized?,” organized labor, much of it
immigrant, was to become a mighty force in Pittsburgh. In 1933 and 1934, after passage of the National Industrial Recovery Act (NIRA), employers established company unions. When the National Labor Relations Act (Wagner Act), which assured the right to independent organization, was passed, employee representatives began to organize without employer oversight. By 1935 the American Federation of Labor (AFL) convention was split between advocates of craft unionism and advocates of trade unionism. Trade union advocates formed the Committee for Industrial Organization (CIO) at this 1935 convention. Soon the CIO undertook significant organization drives in Pittsburgh industries. The new unions had also become an important political force in Pennsylvania, helping the Democrats to win the governorship in 1936. Summer 1936 was marked by U.S. Senate investigations of company shaping of milltown life, undertaken at the urging of the CIO. By March 1937, the largest steelmakers (Big Steel) had signed a contract with the CIO-affiliated Steel Workers Organizing Committee, though steelworkers would continue to struggle for unionization with the smaller companies (Little Steel), including local giants like Jones and Laughlin. The CIO had its first independent convention in Pittsburgh in November 1938. John L. Lewis, president of the United Mine Workers, the strongest local union, would become the CIO’s first president.
Pittsburgh held national interest during the 1930s both because of its sharply defined class conflicts and because the very technology of steel was a dramatic symbol of industrial power. Celebration of the power of industry provided reassurance of industry’s strength and dignity, much needed during the Depression. National magazines portrayed the drama of steel-making in Pittsburgh, though the city was working at just above 1/6 of its capacity. “Pittsburgh, the City of Steel” was published in the short-lived Home Geographic Monthly in March 1932. The need to emphasize the nation’s industrial dignity in Pittsburgh, grounded famously in local geography, should make the new magazine’s choice unsurprising. Similarly, in August 1932 the New York Times featured an article on the steel industry and its hopes for economic recovery. “Giant Steel Primes Itself for Action” was illustrated with a large smoky picture of a smoky steel mill, captioned “Steel Grips the Imagination; It Is Big and Boisterous and Picturesque – The Drama of a Great Blast Furnace.” Another large photo was captioned: “Beautiful, Terrifying, Symbolic – Where Steel Pours In Blue-White Cataracts to Keep the Mammoth Caldrons Bubbling.” The language mirrored that used to describe the city of Pittsburgh by writers throughout the previous hundred years. The article took steel to be “again a center of American interest,” accounting “in normal times..for...one-fourth of America’s total industry.” The Times claimed that the “burly giant” steel was “bestirring itself, girding for action, looking ahead to economic recovery” and that this was a hopeful sign for all industry since “as steel goes, so goes the nation.” What could be said of steel, could, and would, also be said of Pittsburgh.
Images of Pittsburgh’s heroic strength were to instill confidence in industrial
dignity and hope for economic recovery. Yet the Times also exposed Pittsburgh’s
economic vulnerability to the technological change natural to the industry: puddling
furnaces had been replaced by Bessemer Converters, these had been replaced, in turn, by
Open Hearth Furnaces, eventually to be supplanted by electric furnaces, already useful
for the making of “high-grade alloy steels.” South Chicago, not Pittsburgh, housed the
three largest electric units in 1932. While Pittsburgh, the “steel capital,” could boast that
“some” of its “many famous mills” were now enlarged and modernized, Chicago, steel’s
second city, was “crowding Pittsburgh dangerously close.” The article also discussed, in
order of production capacity, the Youngstown and Philadelphia districts, Buffalo,
Wheeling, Cleveland, and Birmingham. It devoted special attention to Birmingham in
connection with its prophecy about the electric furnace. The article cautioned: “Proximity
to electric power may in time become as potent an influence in the location of steel mills
as was the proximity of coke and gas,” which had made Pittsburgh a center of the steel
industry. Birmingham, near the bottom of the list of the largest ten centers in terms of
capacity, had the “unique” advantage of access to the vast hydro-electric power resources
of the Tennessee River (soon to be captured by the Tennessee Valley Authority,
authorized in 1933).

The article quoted a British steel master predicting not a takeover of the steel
market by Birmingham but enough competition with established centers to “eventually
dictate what the price of iron shall be.” Under the “Pittsburgh-Plus” system, in force
informally since the 1880s and by formal agreement from 1909 to 1924, Pittsburgh,
because of its low production and transportation costs, served as the basing point for steel
prices throughout the wider steel industry. Steel makers in Chicago, for instance, had agreed to sell their steel for the Pittsburgh price plus whatever it would have cost to transport their own Chicago-produced steel from Pittsburgh to the point of sale. The policy had allowed Pittsburgh steel makers, more distant from western markets, to have flexibility in meeting newer western competition. The underlying practice of paying freight rates for steel buyers would to be prohibited by a supreme court decision in the 1940s. Like high tariffs, long a cherished political cause in Pittsburgh, Pittsburgh Plus had propped up an industrial system supposedly grounded in nature and necessity alone. Acknowledgment of the political contingency of the local economic system could only undermine the confidence that appeals nature were meant to underwrite.

5B.4 Pittsburgh Writers in Depression: “Our Forefathers Were Pioneers, So Are We”

Pittsburgh writers leaned even more heavily on the city’s historical relationship with nature to support their predictions of recovery. Haniel Long’s two part poem “Pittsburgh Memoranda,” published in the Survey Graphic in spring 1935 was a more explicit working-out of Pittsburgh’s current problems and hopes for the future than his 1925 “How Pittsburgh Returned to the Jungle” had been. Long offered historical memoranda, connected to present day reflections. His first “memorandum” began

Our forefathers were pioneers.
So are we.

Long’s piece relied on frontier ideology: it celebrated nature, natural beauty and the way in which Pittburghers stood up to danger. It urged Pittburghers to “stay pioneers.” Long emphasized that the pioneers had built “a new city where these rivers meet...” Despite the
pervasive warnings of senescence, expressed in the articles discussed above, Long thought of Pittsburgh’s newness and danger as ongoing characteristics. Yet frontier strengths and difficulties did not dwarf the troubles of Pittsburgh in depression. Long saw the city’s future as full of danger, struggle and adventure, like pioneer exploration.

We live in the homes and the new city they built and find it none too easy.

Our forefathers went shadowlike into beautiful new valleys of orioles and of rhododendron – and of death.

Our forefathers went shadowlike into beautiful dangerous new valleys, exploring and hoping; and so do we.

Long’s poem celebrated the inherited “intrepidity” of the pioneers that Pittsburghers could now draw upon to face contemporary uncertainties. Pittsburgh searched, like the pioneers for springs, new sources of fresh life-giving water. Long connected technology – furnaces pouring smoke into the sky – with what is life-giving and path-making in nature: springs, trails leading to water, and mountain passes.

The sky is a vast inverted bowl of blue; about the circling rim the furnaces are emptying into it like yellow rivers.

We have sense which may lead to trails, we may find trails which lead to water; we are making a new compass, are feeling towards passes through mountains even in the fantastic air of chambers.

Intrepidity was not interred with our forefathers, and nothing matters now but finding springs.

Following the elder wisdom we cherish likewise the new;
we stay pioneers.....

For Long, Pittsburgh in its old age, cherished the new, yet the very orientation toward newness and change was built on an essential identity as old as the frontier. The poem seemed critical of technological progress but expressed belief in an obligation to hope in it and go along with it.

...Time brings forth ages when
all things move fast: such is our age: and it’s better
to have all things move fast, better at least
for those who follow you – and follow us.
Yes, it is better; it will be shown to be better.

Long spoke of the necessary and painful rebirth of the city:

This obscure hurt which never gives us peace...
We can explain why it is not our fault,
but it remains out fault.
We can distract ourselves, but the hurt is there,
our slow undoing through our sympathies:
the slow coming to birth within our living body, of the new body made of ours.123

The second part of Long’s “Pittsburgh Memoranda” spoke again of the search for water and ended with the image of Pittsburgh in the darkness before dawn:

this need of ours to grow into our future,
to heal the wounds of living and of dying
how should we fail it?

We shall not fail it:
Can an oak be grown by the seventh day?
The great new sun, the sun of our life together
is hardly yet at rising; we are men
peering about us in the dark of the dawn.124

The theme of darkness before the dawn would become more prominent in the second half of the 1930s. After 1935 national articles focused more sharply on Pittsburgh’s economic, environmental and social conditions, discussed in a reformist tone.
As in earlier times, the social survey and social work community was central to efforts to reform the city. *Survey Graphic*, in which Long’s piece appeared, was owned by Survey Associates, sponsors of *Survey* magazine, the *Pittsburgh Survey* and of a more recent sociological investigation of conditions in Depression Pittsburgh. Its subsequent Pittsburgh features interleaved paintings and sketches of scenes from the city with both recapitulated and updated reports on social conditions there. One series of articles was illustrated with five paintings of Pittsburgh by John Kane, the Pittsburgh boxcar painter whose work would make its way into the collection of Mrs. John D. Rockefeller.125

The new sociological study had been conducted by Dr. Philip Klein of the New York School of Social Work and was published in early 1938 by Columbia University Press. Klein had been recruited by a group of Pittsburghers, the Citizens’ Committee of the Social Study of Pittsburgh and Allegheny County, which included former mayor William A. Magee. The Committee had applied for funds from Pittsburgh’s Buhl Foundation to investigate local social service provision in hopes of improving it. The new survey was conducted while the city was subject to the full effects of the depression, between August 1934 and January 1936.

Like the original *Pittsburgh Survey*, the Klein study publicly embarrassed the city. Though prominent citizens had commissioned the report, its conclusions were highly critical of local industrialists and politicians and of the kind of urban life their rule had fostered. The study painted a picture of a city sharply divided on parallel class and ethnic lines and ruled by a “dictatorship of big business.”126 Its characterization and indictment of the city had much in common with that offered, several years earlier, in the Harper’s article “Is Pittsburgh Civilized?” Klein described the “insecure foundation in
work and wages on which households must depend in one of the seemingly most prosperous industrial cities in the New World” and the inadequate efforts to handle the city’s social problems.127 He showed declining prosperity in Pittsburgh long before the Depression: “the ratio of the number of jobs to the number of applications was falling drastically long before 1929.” Production in heavy industries was leveling off, while other industries were growing. The study found some improvements since the original Pittsburgh Survey, in unionization, child labor, and worker’s compensation. Yet poverty was pervasive and Klein saw it as “the chief problem of social life.” Decent affordable housing was still in short supply. Pittsburgh was a microcosm of the nation in depression, and, as in the original Pittsburgh Survey could clearly illustrate the nation’s problems.

Yet Klein also pointed to another kind of connection between Pittsburgh and the life of the wider world. According to Klein “Its scope and its outlook are national; its financial interests are at least country-wide; and the forces that control its destinies, which are basically economic, are forces that move with the large strides of national progress and regression.”128 Pittsburgh’s economic relations, particularly its “financial interests” were important on the national and international scale. Echoing “Is Pittsburgh Civilized?” Klein speaks of aristocratic Scotch-Irish opinion-makers and their dominance in local ideology: “conceptions of the paramount importance of corporation growth, of religious, philosophical and political conservatism, Scotch-Irish and British descent, established generations in America and the possession of wealth are combined and held together in family and social bonds in a closely knit local social aristocracy.”129 Klein was encouraged by new labor organizing efforts, particularly by the CIO, but was more cautious than Duffus about predicting their results.130
Margaret Byington, author of *Households of a Mill Town* in the original *Pittsburgh Survey*, summarized Klein’s results for *Survey Graphic*. Her article was accompanied by two sets of sketches depicting the city. The sketches emphasized Pittsburgh’s environment, though Klein’s survey had seemed almost intentionally to ignore environmental problems. In this way Klein’s study withdrew the environmental refuge from the social taken by Pittsburgh elites in response to the original *Pittsburgh Survey*. Yet, Byington, in her summary, described Pittsburgh as a city shaped by nature:

> The modern Pittsburgher has only to look about him to see how the steel district roots in its geologic past; or to sense how topography and basic industries alike have influenced human history.

Natural forces and natural laws – bituminous coal and natural gas embedded in hills cut by rivers – powered the city’s industry: “Heat is the essence of steel production; water at once its cooling agent and the cheap transport for its fuel.” Life in Pittsburgh was built on heat exchange. *Survey Graphic* framed its report of the new social survey with discussion of nature and technology.

The leftist *Forum* likewise reported Klein’s results in an even more explicitly environmental context in August 1938. “Pittsburgh: What a City Shouldn’t Be” emphasized smoke:

> The most immediate impression, of course, is smoke. The air is always filled with tiny black soot particles which settle on one’s hat, one’s face, one’s collar and neck. Near the steel mills, glittering specks of graphite dust [cover] one over like a newly decorated Christmas tree.

*Forum* spoke of Pittsburgh’s “pungent” personality and “Smoke-plumed mills stretching interminably down the valleys.” It called Pittsburgh’s smoke problem “(1) ancient (2) unsolvable (3) unsolved.” The article took anti-smoke efforts to have come to naught:
Measurements taken during the ‘twenties revealed that Pittsburgh was being deluged with a soot fall of incredible proportions – from 600 to 2,000 tons of soot per square mile per year. The Mellon Institute has been making a study of air pollution. But, if the air has been clearer of late years, it is owing to lack of orders and not to the Institutes’s researches. For smoke in Pittsburgh is an economic rather than a scientific problem. Smoke-eliminating devices exist, but the owners of the city’s thousands of mill stacks have seen no profit in installing them.\textsuperscript{136}

Mill superintendents gave no thought to the common good or to the quality of domestic or community life. Forum asserted, “Pittsburgh, properly speaking, isn’t a city at all, if one defines a city as a place designed primarily for human habitation.” Instead it was “a vast industrial organism, planned to produce goods efficiently” and as such had “for generations... been America’s finest example of “what a city shouldn’t be.”

Parks, schools and bridges, according to Klein, had all been significantly improved since the Pittsburgh Survey. Yet “[i]n fields where there [was] conflict between the interests of the business community and the interests of the community as a whole,” Forum asserted that “there has been little or no progress since 1908.”

Reforms which have threatened its economic interests, like the twelve-hour day, have been extorted only after a long struggle. It has granted of its own free will only ‘safe’ and minor concessions, which it has yielded all the more freely because of its determination to make no major concessions.\textsuperscript{137}

Pittsburgh redevelopers had to “content themselves with noncontroversial labors like parks and boulevards.” In contrast, Forum alleged, a cost-effective flood control plan proposed in the 1900s had been rejected because the report recommended building reservoirs on the Allegheny and Monongahela that would have provided hydroelectric power. This would have threatened the Mellons’ Pittsburgh Coal Company’s interests in coal-fired electricity generation. Pittsburgh’s crying needs in addition to flood control were working-class housing and municipal consolidation, both unlikely to be adequately
addressed. Forum charged that Pittsburgh’s Business Community had “evad[ed]...its responsibilities as the ruling class of Pittsburgh.” It offered “ideals, spiritual values.....without...relaxing for an instant its grasp on the good things of this world.”

Forum contrasted investments in churches and academic buildings with housing in which “nine negro families use the same toilet.”

Like the other articles, Forum spoke of Pittsburgh’s looming industrial decline: “Thirty years ago, Pittsburgh was brutal and lusty. Today she is somewhat more refined but also a good deal feebler.” Where “Is Pittsburgh Civilized?”could only hope for future political reorientation, Forum counted it as an established fact, resulting from the breakdown of the “old order....under the impact of unparalleled depression.” In 1933 Pittsburgers had elected a Democratic mayor and council “for the first time in 30 years” and in 1936, for the first time since the founding of the Republican Party at an 1856 convention in Pittsburgh, Democratic voter registration exceeded Republican. Forum echoed the Klein survey’s hopes for community rebirth at the hands of newly organized labor:

The great unknown factor in the Pittsburgh of 1938 is organized labor, which is advancing toward power as the Business Community proves increasingly incapable of ruling....Pittsburgh mills... have signed up without a fight. The Steel Workers’ Organizing Committee is a power in local politics...Pittsburgh’s future depends partly on the success of labor’s drive for political power, partly on whether the business Community can and will grant the rest of the community some measure of democracy.\textsuperscript{138}

By 1938 and 1939, other signs of hope were evident. American City, looking back from 1938, proclaimed “Pittsburgh’s Clean-Up Campaign Began in 1935.”\textsuperscript{139} The New York Times in March 1938 featured another R. L. Duffus article. “American Industry: Many Headed Giant,” based on United States government reports, discussed
Pittsburgh as one of six industrial centers accounting for the production of 1/3 of goods in the United States. While Duffus compared Pittsburgh unfavorably with Detroit, his survey of nationwide industry concluded by employing important Pittsburgh symbols to describe American industry as a whole. Like Long, Duffus associated industry and technology with new life in nature and with life-giving water:

No less than agriculture, industry is life. Smoke, fumes, metal grinding against metal, armies of workers marching and counter-marching: these too are symbols of survival, just as is the green shoot of wheat breaking the rain-soaked earth.¹⁴⁰

As the nation waited for economic springtime, national articles attended to post-Depression planning for Pittsburgh. In March 1939, American City published “Pittsburgh Begins to Rebuild.”¹⁴¹ The article celebrated the fact that the City Planning Commission’s scheme for waterfront boulevard construction, planned in basic form by other bodies and delayed for 40 years, was finally being built. The article also raised the question of how the Point should be used, redevelopment of which would be a centerpiece of the Pittsburgh Renaissance of the 1940s and 1950s.¹⁴²

By the end of the 1930s, civic boosters were evidently successfully promoting the city. Pittsburgh¹⁴³ was to host at least three national conventions in 1938 and 1939: the American Home Economics Association, the American Public Health Association, and the Recreation Congress.¹⁴⁴ The home economists anticipated pleasant environmental and cultural surprises in store for members. Its journal predicted that attendees “would probably decide that though Pittsburgh may once have deserved the sobriquet of ‘the smoky city,’ soot does not now appear to be more abundant there than in the ordinary industrial city.” The home economics journal also extolled the site’s natural advantages
and praised the Oakland civic center, including a new Mellon Institute building (to be discussed below).\textsuperscript{145}

As early as October 1938 the \textit{New York Times} had reported Pittsburgh’s escape from Depression: the “Steel Industry’s Boom”:

\begin{quote}
PITTSBURGH, Oct. 28 (UP) – Columns of smoke by day and the flow of furnaces by night attest one of the greatest booms in the history of America’s steel industry. Three months ago steel salesmen found it difficult to get orders. Today the $5,000,000,000 industry is pressing “obsolete” mills into service and orders on hand have reached a peacetime record.\textsuperscript{146}
\end{quote}

The short blurb in which the \textit{Times} first announced Pittsburgh’s recovery included the essential elements from which the city’s national image had been constructed during the Depression. It was also a brief testament to how difficult it would be to put these worries to rest once the depression was over.

\textbf{5B.5 “Industrial Maturity”}

Despite reports of incipient recovery, Pittsburgh’s deep difficulties would remain the subject of expert deliberation and discussion. Two University of Pittsburgh economists, Glenn E. McLaughlin and Ralph J. Watkins, summed up contemporary anxieties about Pittsburgh’s future and its relation to the future of the nation as a whole in “The Problem of Industrial Growth In a Mature Economy,” published in the \textit{American Economic Review} in March 1939. They took Pittsburgh as a microcosm of the economic maturity that threatened the United States industrial system. Their concern was whether the current economic system could provide continued economic growth and a rising standard of living and whether it could solve the problem of cyclical unemployment. The economists asserted that the very survival of American capitalism (“the business
enterprise system”) rested on their analysis of the situation in Pittsburgh. McLaughlin and Watkins listed the “earmarks” of “industrial maturity” as decreased growth in heavy industry and factory construction; slowed growth in total production, employment and population; increased emphasis on consumer goods and lessened demand for capital investment in producers’ goods; and lowered interest rates. To these economic markers they added signs in community psychology: “painful memories of capital losses,” “pessimism bred of inspection of mature trends” and “fear of public interventions made necessary in response to those mature trends.” Such maturity could quickly lead to decay.

Pittsburgh was advanced along the trajectory of maturity. Before 1909 Pittsburgh’s annual growth rate had exceeded the nation’s but then had begun to taper off, reaching “maturity about two decades ahead of the country generally.” Its “leading industries [were] comparatively old.” Coke and coal production in the district were actually declining, and steel production trends were almost flat. Steel, coke and coal so dominated the district that “comparatively favorable rates of growth in glass, electrical equipment, and aluminum” were “of only minor assistance in raising the trend of total industrial output.” While consumer goods industries were growing rapidly, they were overshadowed by the old heavy goods sector. The economists were not hopeful about the prospects of help from new industries since they would “for a long time be dwarfed by the overwhelming importance of the older forms of economic activity.” The article noted “none of the new important industries which have developed in the United States in the past forty years have taken root in Pittsburgh” though they had been heavy consumers of Pittsburgh’s products: coal, steel, heavy machinery and glass.
McLaughlin and Watkins claimed that the slowing of the Pittsburgh district’s industrial growth had been “accompanied by large exports of capital to other parts of the country.” Banking and investment were one healthy sector of the Pittsburgh economy. Yet they funneled capital out of the city. McLaughlin and Watkins connected the development of Pittsburgh as an “investment center” with industrial maturity and the establishment of “economic colonies.”

Pittsburgh became an important investment center at about the time that it began to show signs of industrial maturity. Indeed, somewhat earlier there were evidences that capital and men were moving from Pittsburgh mainly to the West, South, and Southwest to establish newer concerns in the steel, coal, and petroleum industries. With the arrival of full maturity after the World War, Pittsburgh’s need for ‘economic colonies’ became acute, and large quantities of local savings – and War profits – were invested in other districts, primarily in steel and oil but also in sulphur, aluminum, glass, electrical equipment, food canning, public utilities, and a great variety of other forms of business. In part, outside investments have taken the form of branch plants of Pittsburgh-controlled concerns or of fellow subsidiaries where the Pittsburgh operating concern is controlled elsewhere. For example, large amounts of Pittsburgh profits must have gone into the development of the Gary steel district.148

The Mellons would have been major players in these developments, with their own investments in Gulf Oil and ALCOA and in their role as the major banker for local industries.

More recently, the development of Pittsburgh as an important investment banking center, containing as it does one of the country’s major underwriting groups for the sale of new securities, has facilitated the flow of Pittsburgh savings through investment channels to all parts of the country as well as abroad.149

McLaughlin and Watkins described multiple aspects of the economic culture in which Mellon initiatives were based. The economists took intensive technological innovation as a precondition for any investment in local industries under mature conditions. Indeed, industrial maturity had made Mellon Institute. Such laboratories
created the basis for the small amount of investment in local technological improvement still possible.

Industrial maturity and the absence of important new industries have meant that if Pittsburgh capital was to be invested locally it had to be used primarily in the further mechanization and rationalization of Pittsburgh’s industries...the turning back of capital into the same industry has required the careful study of investment opportunities and has led to the organization of large research laboratories in the district, particularly those in steel, coal, oil, glass and aluminum.\textsuperscript{150}

Nonetheless, most of the research undertaken at Mellon Institute was a far more important source of technological innovation for use in Pittsburgh’s economic colonies: “Some Pittsburgh capital is no doubt being used in the development of new local industries, but in such a mature area a large proportion of capital funds must be exported.”

These University of Pittsburgh economists, speaking to a national audience, placed Mellon financial and research enterprises at the center of the dilemma of Pittsburgh’s future. The themes they raised in their characterization of Pittsburgh’s economic culture would dominate both local and national narratives treating the city and its smoke for decades. In many of those narratives, worries about industrial maturity were connected directly to concerns about air pollution. Bituminous coal was probably the nation’s most mature industry of all. In addition, as we have seen in previous chapters, Pittsburgh’s smoke had long been viewed as a chief impediment to essential industrial diversification.

McLaughlin and Watkins concluded by calling for a modification of the “enterprise system” itself, involving “co-operation of a higher order between industry and government.”\textsuperscript{151} While industrial maturity had perhaps brought “social consciousness,”
the economists warned of a lack of money, under a mature regime, to invest in solving the social problems created by earlier growth. Further, those who had made profits in boom times were “likely to move along with their savings to other and greener pastures” having become finally conscious of insuperable difficulties at home. The Pittsburgh Renaissance mobilization in the 1940s would be a studied response to these sorts of considerations. The work of McLaughlin and Watkins illustrates both national and local cognizance of these issues. Below I will analyze Pittsburghers’ constructions of the Renaissance problem and their attempts to solve it. First, however, it is important to examine some of the responses of the 1930s and the way in which Pittsburgh’s local predicament fit into national narratives in these years.

5B.6 Pittsburgh in Local and National Narratives in the New Deal

As we have seen, Pittsburgh in the 1930s was threatened by decline and was, by consensus, ripe for change. Various national narratives used to make sense of the Depression either brought characteristic Pittsburgh themes to national prominence or expressed national themes on a local scale. Predictions of Pittsburgh’s redemption based on its position in national narratives competed with claims that intrinsic and exceptional local strengths would save the city. As we have seen, one theme advanced was that decline could be resisted by means of the city’s special relationship to nature through technology and work. New Deal politics promised to remake the city through industrial regulation and sweeping unionization. Technological transformation, such as that involved in the change of fuels or combustion technologies, and as embodied in the work of Mellon Institute, could also promise redemption. Such technological transformation
was identified with civilizational change in Lewis Mumford’s influential 1934 book *Technics and Civilization*. The transformations Mumford described were embodied in the mission of Mellon Institute in these years and expressed in the architectural design of the new Mellon Institute building completed in 1937.

In contrast to the Mumford/Mellon Institute solution, unionization and political resistance to the local oligarchy represented another avenue for Pittsburgh’s salvation. The Klein survey and several national articles discussed this possibility. It is also represented in Marc Blitzstein’s 1937 Federal Theater Project drama *The Cradle Will Rock*. While not explicitly set in Pittsburgh, *Cradle* portrayed a “Steeltown,” controlled by “Mr. Mister.” In the play all characters can make their living only by subjecting themselves to Mr. Mister’s domination, in one form of prostitution or another. These included workers refraining from political or union activity in order to keep their jobs, or artists, scientists and intellectuals dependent on wealthy patrons. The play begins when a policeman arrests a harlot but then attempts to buy sex from her by offering not to turn her in. She refuses and at night court she meets “The Liberty Committee.” The committee is composed of prominent citizens who had organized an anti-union protest but been mistaken for union agitators and arrested. The members of the Liberty Committee, several academics, an artist, a minister, a physician, and a newspaper editor have all betrayed their ideals in order to serve Mr. Mister. A real union organizer eventually arrives at court as well. The play ends with the union leader refusing to take a bribe from Mr. Mister and thereby rocking the cradle of power in the city. The organizer receives word that other unions have joined with the steelworkers he represents. Such solidarity represents the community’s redemption. *Cradle* echoes the multiple allusions in the
national press to Pittsburgh’s working people and immigrants as sources of needed civic redemption. The theme of the play is that the cradle of power will rock when people have the courage to reject a life of prostitution. The Harpers’ article, “Is Pittsburgh Civilized?” had predicted a similar outcome when it foresaw that the new ethnics kept out of Pittsburgh society by the likes of the Mellons would rise to re-make it. Cradle would tour the real steel towns of Ohio and Pennsylvania in the weeks after it was closed in New York because of its political content.154

Transformation – and even resurrection – was universally expected, but the form it would take was contested. Cradle, Klein, and Harpers’ provide one model – a takeover of the city by unions and new ethnics. “The Pittsburgh Owl,” “How Pittsburgh Returned to the Jungle,” and “Fiery Pittsburgh” hinted at another source for Pittsburgh’s transformation: the vitality of nature in the city – both nature as exploited for industrial work and as standing independent of the city’s use of it. Local poet Eleanor Graham also predicted that the city’s fortunes would rise again after the Depression because of its special relationship with nature and in spite of its ruling elites. Yet, in “Pittsburgh 1932" she also equated the city’s lack of smoke during the Depression with its age and senility, and coal mining with the sacrificial offering of coal and men.

I am the city of Pittsburgh.
I am the city of rivers.
Smoke city,
Steel city,
Coal city,
Once.

During the War I gave to the world:
Out of my furnaces, red with flame,
White with heat,
Damp with sweat,
I gave my steel.
Out of my mines, I gave my coal.
I gave my men.
I gave my life in the lives of men.
In sweat,
In labor;
In blood;
I gave.

Now I am quiet as old men are.
I lift my empty smokestacks
Trying to be proud.
Where is my smoke?
Where is my steel?
Where is my dirt?

Graham’s poem mixed elements of New Deal visions of the dignity of labor with the reassertion of the importance of local natural abundance.

But the rivers are mine.
Allegheny,
Monongahela,
Ohio,
You are mine.
They cannot take you.
And the kind fog pretends to be smoke.\textsuperscript{155}

The poem predicted that Pittsburgh would rise again, but not because of “the Chamber of Commerce and Mellon Bank.” Recovery depended on nature, on Pittsburgh’s rivers and hills, on “its belly rich with coal” and on nature’s laws – reflected in the rising of steam from a cigarette dropped by a bum in the river.\textsuperscript{156} With the cigarette’s hiss Graham placed local nature in the context of the universal natural laws on which industrial technology rested. Smoke from coal, or from a discarded cigarette, was proof of the reliability of the natural processes to which Pittsburgh could look for redemption. Like Long, Graham emphasized historical continuity rather than civilizational change as the guarantor of Pittsburgh’s survival.
Others emphasized the need for and inevitability of permanent change. For Lewis Mumford, and for British biologist turned civic thinker Patrick Geddes before him, Pittsburgh embodied decaying industrial civilization based on coal – “the paleotechnic.” Geddes discussed Pittsburgh and its smoke in this connection in his 1915 *Cities in Evolution*. Mumford’s reading of Geddes prompted him to abandon plans for further formal education and to begin a program of self-education intended to prepare him to develop a “political philosophy of cities.” Having read both Geddes and the *Pittsburgh Survey*, Mumford had taken a summer job in Pittsburgh in 1917 in order to study it “as an example of a paleotechnic industrial centre” and to “commune with Pittsburgh in every aspect.” In 1921 he would write to Geddes of his desire to revisit the city. Mumford’s initial plan for a first book was to treat Pittsburgh as one of four American cities. Though this plan never came to fruition, Pittsburgh figured prominently in the first book he did publish, *Story of Utopias* (1922), as a prime example of a “Coketown” a central motif in the book. (Pittsburgh appears again a Coketown in *The Culture of Cities* (1938).) While Pittsburgh’s character clearly shaped Mumford’s thought, it is difficult to tell how widely read he was there. Yet, his work provides a way to understand visions of Pittsburgh’s future that are embodied in new technological enterprises underway in the city between the wars – particularly at Mellon Institute and in other Mellon industrial enterprises. While it is not clear whether the Mellons, or the scientists and engineers involved, read Mumford’s work, by 1950, the Mellons regarded Mumford highly enough to be invite him to Pittsburgh to assess some of the results of the Renaissance.157

In *Technics and Civilization* (1934) Mumford understood the sort of transformation many expected of Pittsburgh as a civilizational change. Such change
would be both driven by and expressed in technology. Mumford saw industrial society as engaged in a transition between two civilizational eras identified by Geddes, moving from the “paleotechnic” technological regime to the “neotechnic” technological regime. Mumford elaborated Geddes’ conceptions of the paleotechnic and the neotechnic. The paleotechnic era rested on iron and coal and on steam power, while the neotechnic rested on “new alloys, rare earths, lighter metals” as well as on electricity and synthetic chemicals, coal by-products prominent among them. For Mumford, aluminum, light, highly conductive, globally dispersed in small quantities and dependent for its refining on large amounts of electricity, was the most characteristically neotechnic metal. Mumford took the importance of minute quantities and the global dispersal of resources to be hallmarks of the neotechnic age. He expected these emphases to challenge even existing, paleotechnic, industries to rise to new levels of efficiency – of lightness and compactness but also of the re-use of wastes.  

The use of widely dispersed materials found all over the world in minute quantities meant that the neotechnic marked the end of the dependence of industry on local raw materials, hence on local nature. Likewise, Mumford saw synthetics, such as those made from coal-tar, as offering “greater freedom from local conditions.” Synthetic fabrics, for instance, could free the clothing industry from vulnerability to a plague striking silkworms. Indeed, Mumford took the utilization of coal tar through by-product ovens to be “one of the greatest neo-technic advances.” It combined two of the hallmarks of the neo-technic: the efficient re-use of waste and the production of synthetic substitutes for natural products. Coal by-products were condensed from combustion emissions. The consequences of neo-technic civilizational change for Pittsburgh were
clear. The city that owed its existence to local natural resources was to be vulnerable to global industrial competition.

The Mellons and Mellon Institute were heavily involved in neotechnic research. As early as the period of the initial Smoke Investigation, in 1911-14, Mellon Institute was engaged in research in synthetic organic chemistry; by the 1930s and 1940s a great number of these projects focused on coal by-products. A pamphlet describing the architectural symbolism of the Institute’s new building, published originally in 1937, saw the production of synthetics from coal and petroleum as the most valuable type of research conducted at the institute. The importance of minute quantities and the seemingly magical transformation of substances in organic chemistry carried important symbolic resonances – particularly resonances with alchemical transformation. Mumford claimed that the new regime would inspire a remaking even of paleotechnic enterprises themselves. The reprocessing of industrial waste and the emphasis on efficiency, as well as the emphasis on electricity itself, linked neotechnics with smoke control.

5B.7 The Neotechnic and the Paleotechnic at Mellon Institute

Neotechnic ideology was embodied in the structure of Mellon business investments. New technologies improved the Mellon brothers’ financial situation in the first decade of the twentieth century. Investments in Alcoa aluminum, Gulf Oil and Koppers by-product coke ovens would become at least as important to the Mellons as their banking business. It had been money from these investments, in industries that either did not depend on Pittsburgh’s local natural resources or were characteristically neotechnic, that allowed the
Mellons to found the institute in the 1910s. It did foundational research for the companies that would become Union Carbide and Dow Corning, among others.

The neotechnic ideology embodied in the work of the institute was expressed in the design of its new building, the “Temple of Science,” dedicated in 1937. When the new Mellon Institute building was built, it was one of the biggest and best equipped laboratories in the world. The symbolism of the decorations highlighted important aspects of Mumford’s neotechnic era. At the time of its dedication, the new Institute building contained more aluminum than any other structure on Earth. The elevator doors were made entirely of Alcoa aluminum inlaid with alchemical symbols. The institute made alchemy a prominent metaphor for its chemical work in the manufacture of synthetics from natural materials, especially coal by-products, which took up so much of its work. Much of the research to be conducted in this “Temple of Science,” laid out inside and out on the plan of an ancient Greek temple, involved production of synthetics from industrial wastes.

The writings of Lewis Mumford and the architectural design of the new Mellon Institute building mirror one another and express powerful cultural forces that would shape technological and environmental as well as social and cultural developments in the period. The new building featured quotations from important figures in world history. One of the most prominent was a quotation from Aristotle: “If there is one way better than another, it is the way of nature.” Pamphlets written for the dedication recognized the contradiction between this pronouncement and the concentration of the institute’s work in the manufacture of the artificial. They reinterpreted the phrase to mean that “nature teems with great things” from which the artificial could be made. Mumford used similar
language in his discussion of the relationship of the new synthetic chemicals to nature. Alchemical transformation, the metaphor for the institute’s work, central to the building’s decoration, had long been understood as imitating and accelerating natural processes. From the standpoint of a twentieth century conception of chemical elements as intransmutable, however, alchemy, and by analogy, organic chemistry, could appear to artificially transgress natural boundaries. Criticisms of the work of Mellon Institute, such as those of Harvey O’Connor in Mellon’s Millions portrayed the institute’s organic chemistry work as the production of cheap and dangerous artificial products with which to counterfeit the natural. The building’s designers stressed the traditional alchemical conception; what moderns might regard as transgressive transmutation was in fact conformity to and dependence on nature. While decorating aluminum elevator doors with alchemical symbols, designers of the institute reserved wooden panels in the library at the heart of the building for carvings that represented the natural sources of the artificial products made at the institute. Aluminum, the paradigmatic neotechnic metal, was associated with alchemical transformation into the synthetic, and wood, a material of Mumford’s eotechnic age (the age of wood and water power prior to the paleotechnic age of coal and iron) with the raw materials for such transformation. Coal and iron themselves, the materials mostly closely associated with local industrial identity – and with the paleotechnic – were conspicuously absent from the decoration of the new building. Coal, Pittsburgh’s flagship local resource, appeared only in association with coal by-products.

The close connection of changing local views of the importance of bituminous coal to smoke abatement is evident in work at Mellon Institute. This is especially clear in
the fading of the idea of the “natural fuel” for a region from smoke abatement rhetoric and with the introduction of research focused on the competing type of coal at Mellon Institute under the auspices of the Anthracite Institute, to be discussed below. Smoke abatement work at Mellon Institute would eventually abandon the premise that solutions to the smoke problem must continue Pittsburgh’s dependence on the products of local mines. Herbert Meller, writing in 1926, had espoused the idea that any efforts at smoke control must recognize the area’s “natural fuel.” Yet by July 1929, Meller took oil and natural gas as desirable modern methods for home heating. By April 1931 Meller predicted that Pittsburgh would eventually become a gas- and electric- powered White City and expressed no concern for the fate of the area’s “natural fuel.” Even in 1934 in “Air Pollution in an Industrial Depression” Meller did not return his allegiance to bituminous coal. He characterized natural gas as an ideal fuel – if not too expensive. In a talk in the same year (1934) entitled “Air Hygiene,” Meller consciously revised the idea of the “logical” or natural fuel.

Because of its close association with electricity, entrance into the neotechnic is linked with control of air pollution from paleotechnic coal and its use in steam generation. This connection was apparent in the discussions of the Mellon- and Schwab-sponsored conference on the future of bituminous coal held in Pittsburgh in 1926. Smoke regulators had long looked toward electricity production from central plants (burning either coal or other fuels) as an important contributor to smoke abatement. In 1926 Pittsburgh newspapers predicted that Pittsburgh would come to rely on electricity from central plants, and in 1929 Herbert Meller had reiterated the importance of central heating plants. For Lewis Mumford, energy sources dictated the dominant materials in
a civilization. It was no accident that aluminum had developed in the same period as had central power plants. Electricity challenged coal, just as aluminum challenged steel.

Both Mumford and the Mellon building promotional literature recognized the problems of worker displacement and the disruption of traditional industries and industrial communities inherent in the dominance of synthetics over local natural resources. They identified the problem as one of the unsynchronized pace of cultural and technological evolution. Mumford, in addition, related the transition to the neotechnic to rising technological unemployment during an era of increasing production: the years 1919-29. More efficient neotechnic technology had made many laborers superfluous. Yet, both Mumford and Mellon Institute materials gave only lip-service to the unintended consequences of rapid technological change. For the Pittsburgh economists who warned of the dangers of Pittsburgh’s industrial maturity, such asynchronies could prove the undoing of the “business enterprise system” itself.

5B.8 “Making a new compass”: Mellon Institute and the Future of Smoke and Coal Mellon Institute was a highly visible emblem of Pittsburgh’s cultural awakening in the 1920s and 1930s. The Pittsburgh economists writing about the region’s “industrial maturity” had explained the existence of such laboratories in Pittsburgh, by arguing that, in the absence of hoped-for economic diversification, the local economy could be kept profitable only by continual refinement of existing industrial processes. Such refinement would be based on scientific research. In addition, the funding of such research would be attractive to local capitalists who had set up “economic colonies” by establishing innovative, and hence research-dependent, industrial investments around the world.
Mellon Institute served this function in the promotion of the Mellon family’s local and far-flung investments. Involvement in neotechnic researches and architectural representation of neo-technic ideology fits well with the function of the Institute in the context of industrial maturity. Yet, the Mellons, from the founding of the institute and the endowment of MISI, wanted Mellon Institute to serve, or at least to appear to serve, another function. The Institute was to represent the Mellon contribution to the public good.

Mellon Institute officials were well-aware of criticisms that could be leveled against the Institute’s work, for seeking profit at the expense of traditional production techniques and local jobs. Mellon Institute’s promotional materials justified the Institute by claiming that it was a promoter of the public good, through its “pure research,” including, prominently, its work on air pollution. Mellon Institute’s definition of pure science was anomalous, however. Judging by the examples used in the promotional literature, pure science could well be applied science as long as it was not also aimed directly at increasing corporate profit. In an additional contradiction between examples and rhetoric, smoke abatement and industrial hygiene, sponsored in part by corporate money, were the prime examples of “pure research.” While public relations literature emphasized this “pure research,” chemistry for capitalist profit, pursued along neotechnic channels, was the focus of most of the Institute’s work.¹⁷⁹

Given the Mellons’ concern to be seen as acting for the public good through their funding of the institute, scientific investigation of smoke presented an opportunity that could not be ignored. What better way to contribute to the public good than to buy the best modern expertise available and to apply it to a famously intractable local problem?
Since the smoke problem was central to Pittsburgh’s identity, working out that problem in a Mellon laboratory meant working out the city’s future in that setting as well. Smoke investigation at Mellon Institute had begun as reform research, on the pattern of the Pittsburgh Survey. As we have seen in the previous chapter, investigators struggled with competing models of dispassionate scientific study on the one hand and investigation designed to underwrite anti-smoke activism on the other. As we saw in the previous chapter, Stephen Turner finds reform research to be an intolerably self-contradictory program, destined for inevitable disintegration. However this may be, tensions between these two models persisted at the Institute. As the social survey method lost cultural power, and as the depression reduced funding available for open-ended scientific study, the industrial research model at Mellon Institute came to dominate even its air pollution studies.

The actual application of scientific research to Pittsburgh’s smoke problem in the 1930s met with a number of frustrations and ended in irony. The economic constraints of the Great Depression limited funding available for research and so shaped the kind of work that was and was not possible at the institute in this decade. Lack of expected sources of funding for research left Mellon Institute researchers open to corporate sponsorship that led ultimately to the direct solicitation of Mellon Institute research by corporations seeking to justify their own pollution practices. It also led to the employment of Herbert Meller as an ad-man for the anthracite industry.

The Depression and New Deal provided a changing economic environment for pollution control. Meller complained that even though anti-air-pollution enthusiasm was strong and suitable abatement technology was now available, it was hard to take anti-air-
pollution action during depression because of the economic constraints. Nonetheless, he expected the more stringent regulatory climate of the New Deal to make smoke abatement easier. Meller’s 1934 article “Air Pollution in an Industrial Depression” urged the public to prepare for good times and anticipated that the re-vamping of plants for pollution control could provide employment.

Both shortage of funds and New Deal culture shaped ongoing research at Mellon Institute. Depression Era research had roots in the Mellon Institute researches of the 1920s and in MISI. Herbert Meller insisted that damage to human health be a central justification of air pollution control. Throughout the 1920s and 1930s, he had requested greater physician participation, and indeed, physician leadership, in the campaign against air pollution. In 1928 Meller spoke of his wishes for stronger smoke and health evidence and asked physicians to lead the way in providing it. Again, Meller spoke of the need for physician leadership, in November 1931 and in August 1933. Nonetheless, connections between smoke and health remained tenuous, and repeated attempts to strengthen them met with frustration due to both economic and cultural features of the Depression. Further, concentration on health worked against attempts to highlight the seriousness of Pittsburgh’s particular pollution problems – those associated with high volatile bituminous coal.

5B.9 Hygienically Pure Air

After the ambiguous results of the 1929-1930 soot fall study, Herbert Meller shifted his attention from the visible smoke from bituminous coal to all sources of air impurity. In this way Meller, even though prompted by new local data, moved Mellon researches
away from the emblematic problem of Pittsburgh’s smoke, and toward universal generalizations about air. This shift of attention from visible smoke to all air pollutants presented an opportunity for a dramatic increase in scientific oversight and regulatory control of the entire urban environment. The difficulties of arriving at scientific results that could dictate the scope of environmental regulation would, in fact, have both broadening and narrowing consequences.

What was to be taken as the measure of air pollution? What was air pollution to be? Earlier Mellon researchers had concluded that air pollution was not just visible smoke, as measured by tar deposit, though they were not above focusing on tar as a way to congratulate themselves on the success of existing regulations. But — they clearly agreed that air pollution was not simply tar. Was air pollution then what was measured in total soot-fall? No, soot fall measured both not enough and too much. While the 1912-13 study took total sootfall as the sole measure of smoke, it had been clear from the earliest Mellon studies that gases, along with particulates, were responsible for much of the damage attributed to smoke. Soot-fall did not even catch all particulates. It primarily caught heavy particles that fell close to the source. These were neither those most likely to cause fog nor those that — as new evidence from occupational medicine suggested — were most likely to affect human health. In addition, many non-combustion sources of dust made their way into soot fall collection containers. The degree to which the atmosphere should or should not be particulate-free became the central conceptual issue for Mellon investigators through the 1930s.185

Attempts to address this issue became an exercise in determining the limits of pollution regulation. In 1931 Meller introduced the concept of “hygienically pure air” —
air as pure as the food and water supplies regulated and controlled by Progressive legislation and public health infrastructure. Yet hygienically pure air need not be absolutely particulate free. The campaign for hygienically pure air involved the broadening move of considering all combustion emissions, visible or invisible, as threats to purity. Yet it was also an acknowledgment of non-combustion sources of dust – some of which were arguably part of air’s “natural” composition, at least at low concentrations.

In 1933 the Pittsburgh Department of Health included “hygienically pure air” in its latest public education campaign. Meller argued that special concern for air hygiene was justified as a neglected aspect of the Progressive public health program that had succeeded in hygienically controlling food and water supplies. While celebrating the overall decline in deathrates brought about by the latter measures, He pointed to the continuing discrepancy between rural and urban death-rates. The discrepancy favored urban areas in the summer, but urban deathrates worsened in the winter heating season. Meller argued that air pollution limits should be based on health effects.

Both the tenuousness of connections between smoke and health and tensions between broadening and narrowing tendencies in air pollution research are particularly visible in the controversy over air pollution and pneumonia in the 1920s and 1930s. In 1926 Meller had urged investigation of Pittsburgh’s high pneumonia rate, indicating the need to study the health effects of all particulates. The original MISI investigations of pneumonia had examined only the relation between level of carbon pigmentation and pneumonia. In April 1930 the United States Public Health Service Industrial Hygiene and Sanitation section had become interested in air pollution and health and had received
a twenty thousand dollar per year appropriation for research. Asked how best to spend the money, Meller urged the development of a small precipitator and a comparative pneumonia study of multiple cities.\textsuperscript{192} From 1931 to 1933 the USPHS took up a multi-city study as Meller had advised, but they failed to focus on health or technology as Meller had suggested. Instead they concentrated on comparative pollution measurement. The study’s designers explained that the relation of air pollution to health was too complex and the relation between smoke and health too tenuous.\textsuperscript{193}

From 1931 on Meller extended his work on pneumonia. He had re-evaluated old MISI claims that connections between smoke and pneumonia were independent of poverty and congestion. Meller called for a comprehensive examination of the relation between pneumonia and the many factors of urban life – poverty, race, congestion, pollution – that might influence mortality and morbidity.\textsuperscript{194} In 1933 Mellon Institute workers distributed questionnaires on pneumonia\textsuperscript{195} that followed Meller’s very broad investigative strategy.\textsuperscript{196} On the basis of these new data, he confidently argued that there were good parallels between levels of total solids in the air and pneumonia rates.\textsuperscript{197} Meller’s conviction of the strong connection between air pollution and health met with skepticism, even among researchers in fields such as occupational health. Dr. Anthony Lanza of the Metropolitan Life insurance company, a leading occupational disease authority, claimed that the smoke and health connection was only tenuous. He debated Meller after the latter’s address to the New York Academy of Medicine. Meeting participants pointed out that contact infection, as well as smoke, was high in winter, when pneumonia rates were high, and argued that poverty and congestion both contributed significantly to pneumonia.\textsuperscript{198}
Lack of funds during the Depression inhibited efforts to provide a strong justification for regulating air pollution in difficult and expensive science. In part, the lack of resolution of the health question was a casualty both of the Depression and of the limited uses to which reform ideologies could be put within the structure of Mellon Institute. Meller’s reliance on the corporate research funding agency, the Anthracite Institute, provides examples of both these influences.

5B.10 “Anthracite’s Epochal Chance”

Running out of funding at Mellon Institute for studies of the correlation of pollution measurements and on pollution’s health effects, Meller turned to both government and industry for research dollars. New Deal work programs provided supplementary support and labor during the depression years. But the Anthracite Institute and the Air Hygiene Foundation (eventually renamed the Industrial Hygiene Foundation of America) would provide the major funding. Meller would remain connected with the latter organization until his retirement from it and from Mellon Institute in 1942.

The Anthracite Institute, a research organization sponsored by the Anthracite coal industry to promote increased interest in its product, funded a large scale public relations campaign in the 1930s. Meller and L. B. Sisson, a public relations specialist brought in by the Anthracite Institute, were charged with popularizing smoke abatement so that cities “in anthracite territory” would be more likely to adopt stricter smoke regulations (which would favor anthracite) when the Depression was over. Anthracite was losing business (by 1933) to oil and soft coal, as well as to natural gas and coke. Meller and
Sisson were employed to protect anthracite, a “clean coal,” from market-share encroachments.

Meller and Sisson were attentive to the ways in which smoke abatement could become connected with New Deal programs. In their 1932 correspondence with officials at the Anthracite Institute, they argued that New Deal civic rehabilitation must include smoke abatement and that they would work for stricter ordinances in anthracite territory. In a 1934 Collier’s magazine article, Meller and Sisson linked slum renovation to smoke control. Meller argued that it was impossible to wipe out slums without controlling air pollution. Meller’s 1934 draft of an article “Air Pollution in an Industrial Depression” predicted that after the Depression cities would be transformed through rebuilding programs and strict regulation. He expected renovated cities to be smoke free since the technology adequate to the task was now available. Meller and Sisson celebrated the recent adoption by federal housing agencies of stricter rulings on air pollution. They hoped to gratify their Anthracite Institute sponsors by getting the new automatic stoking anthracite furnace (the “anthramatic”) into federal housing programs. They also continued to promote air pollution control as a necessary Depression economy since it saved fuel.

By 1933 Anthracite Institute publicity work had pushed air pollution research at Mellon into the background. Yet by the end of that year Meller and Sisson hoped to revive an improved version of Meller’s research agenda. They described their mission to the officials of the Anthracite Institute. It was to “re-lay scientific foundations for the air pollution campaign” and in so doing provide anthracite with an unprecedented
opportunity to gain market share. Sisson proclaimed: “Here is anthracite’s epochal chance.”

Meller’s own goal was to inaugurate new Mellon Institute air pollution studies focused on air pollution and health. By January of 1934 Mellon Institute, still short of funding, received a federal grant allowing it to employ relief workers and mechanical engineers to correlate heating methods used by survey respondents and self-reported illness. Meller and Sisson sought both to exploit New Deal ideology and politics to anthracite’s advantage and to use anthracite money to drum up medical support – personal and scientific – for standards on which any new ordinance would be based.

In 1935 Meller wrote to director Edward Weidlein requesting more funding for the health studies. Meller called questions of air pollution and health the “fundamental problems” in the scientific study of air pollution. Weidlein granted Meller’s request and animal experimentation with air pollution exposure, begun under the auspices of the Anthracite Institute, was continued. Meller took this work to be at the “very heart of the problem” and hoped, on the basis of it, to be able to set safe limits for exposure to each component of air pollution from each type of fuel and to translate these into pollution control technology. Mounting evidence from the field of occupational health and safety, of which Mellon researchers were well aware, suggested that different kinds of air contaminants had very different health effects and that accepted measures of air pollution favored selected categories of contaminants differentially. Meller was interested not just in examining links between anthracosis and pneumonia but also in the health effects of exposure to silica-bearing ash and in the links between tar exposure and cancer. By focusing on exposure standards, Meller narrowed the focus of environmental regulation
since contamination was to be reduced only to the level dictated by the standard rather than completely eliminated. Nonetheless, the focus on components other than carbon and on health effects other than pneumonia and tuberculosis widened the scope of concern about pollution’s health effects. \(^{205}\) In doing so it also placed questions of air pollution and health in a context larger than Pittsburgh’s historical battle with coal smoke. \(^{206}\)

### 5B.11 The Air Hygiene Foundation

Mellon researchers turned to work in occupational health and safety conducted under the auspices of the United States Bureau of Mines in the 1930s for knowledge about what air quality standards should be. Meller had already begun connecting his work on air pollution at Mellon with the industrial dust studies of the Bureau of Mines in 1930-31. \(^{207}\)

In 1935 a new research body, the Air Hygiene Foundation, was established at Mellon Institute, with Meller as managing director. \(^{208}\) Such an organization had first been proposed in 1933. Like the Anthracite Institute, the Air Hygiene Foundation directly served the purposes of industry. Twenty companies had “brought the problem” to Mellon Institute and Meller called the foundation “industry’s own organization.” \(^{209}\) Its stated mission was to eliminate or reduce to safe concentrations injurious dust and fumes, but its focus was on “separating fact from speculation” and on establishing the limits of employer liability. Its first publication was a legal survey of workers’ compensation laws. The foundation was to treat both the problems of industrial dust exposure and of municipal air pollution.

Connections between these two problems were prominent in many sources in these years. \(^{210}\) A 1934 Pittsburgh newspaper article reported on comparative dust
sampling of cities and industrial dust sampling in India in the same article. In 1934 Meller had exhibited his reliance on the field of industrial hygiene in a discussion of exposure limits for particulates in a talk titled “Air Hygiene.” Meller was concerned about the possible threat of silicosis in those not occupationally exposed. He urged a broadly environmental public health campaign that focused not only on the products of incomplete combustion but also on industrial, but non-stack, pollution sources. Meller justified his program with reference to the previously adduced pure water analogy, adding that the technology was available to regulate air pollution to the degree that health required. In his October 1936 article on the “Social Significance of Air Pollution,” he referred to a new book Industrial Dust, published by the Air Hygiene Foundation, which proposed dust standards for clean country air. Yet Meller emphasized the need to address unanswered medical questions about safe concentrations. Meller saw the clarification of air pollution’s health effects and the establishment of standards for acceptable human exposure to each component as the foundation of scientific control of air pollution. Meller’s 1937 piece, the “Physics of Air Hygiene,” exhibited both broadening and narrowing tendencies. While it emphasized non-combustion sources of air pollution, even mentioning dust storms, it drew on the industrial hygiene context to call for establishment of standards for each kind of impurity to be found in municipal air and heralded dust removal in the industrial context (possible only in light of the establishment of such standards) as an expedient that saved employers money.

Work in occupational health and safety had made clear that no standard of particulate-free air would be upheld for indoor air, much less for the air of polluted cities. Occupational health researchers were interested in specific damage from particles of
particular chemical composition, size and shape. The particles for which health danger had been established were found in much higher concentrations in the occupational setting than in municipal air. In 1936 the Air Hygiene Foundation worked on a problem set for it by the American Smelting and Refining Company of Salt Lake City, which was involved in a legal battle with the federal government. Correspondence between the company and Meller revealed the extent to which the foundation’s research was at the service of corporate profit. The company had commissioned a study of outdoor air pollution in cities. Upon receiving preliminary results, sent early by Meller because of their likely interest to the corporation, smelter company executives responded with an ecstatic letter. They were very happy that the results had shown that sulfur levels in Pittsburgh were higher than the level the federal government wanted to hold the smelter company to, for the air surrounding its plant. Smelter executives said that the results already produced by the study justified their expenditure for the research.214 The techniques employed by the Air Hygiene Foundation were shaped by interest in limiting liability – standards for physiological effects of pollution were therefore high. In addition, work under the auspices of the Air Hygiene Foundation could be put directly toward purposes that promoted rather than restricted air pollution.

The culture of occupational health and safety, concerned as it was with the limits of employer liability, stood in sharp contrast to the Progressive Era culture of protection of food and water supplies from all bacterial or sewage contamination. While Meller repeatedly employed the analogy of pure food and water to explain hygienically pure air, he looked to the setting of standards in occupational health and safety as a model for practice. This both set the stage for the determination of an “acceptable” level of
pollution in municipal air, but it also introduced standards, both of concentration of pollution and of acute physiological effects, that were inapplicable in the more diffuse urban atmosphere. While broadening the attention of air pollution investigation and regulation beyond visible smoke increased the purview of environmental control, justifying that increased control in terms of public health alone introduced standards of justification that were impossible to meet.

Meller was aware of the potential for political divisiveness in the occupational health and safety movement and also of the potential of scientific research to diffuse that divisiveness. In a 1938 article in *Pittsburgh’s Health*, a publication of the Pittsburgh Department of Health, Meller called for control of industrial air pollution within factories on the same basis as he called for control of municipal air pollution. He emphasized, both explicitly and through the connection he made between the two kinds of air pollution, that efforts for occupational health and safety did not depend on the radicalization of labor. The fight for industrial health was like the fight for clean air and therefore was “not a class war sort of issue.”

5B.12 Final Frustrations

In sum then, work at Mellon Institute during the 1930s was hampered by the economic difficulties of the Depression and by the way in which corporate research funds flowed in to partially fill the financial void. Complex studies of pollution measurement had to be discontinued and work on developing a definitive understanding of the health effects of smoke proceeded only fitfully. Experimentation and observation were replaced with cheaper public relations work or with intermittently funded corporate projects that
sometimes weakened rather than strengthened the case for pollution control. Work in occupational health and safety with which the institute became associated introduced unrealistic standards of rigor and levels of confidence in knowledge into the management of outdoor air and the understanding of the health effects of low-concentration exposures. Many of the questions raised by the ambiguous results of soot-fall studies and by other MISI investigations were never definitively answered and many of the pollution components identified in the studies still could not be controlled. In addition, Meller’s desires for precise data on the health effects of various pollution components had been sorely disappointed.216

Efforts to address Pittsburgh’s air pollution problem not set by corporate agendas continued fitfully both inside and outside of Mellon Institute. Such efforts, however, did not even have the benefit of, admittedly limited, corporate resources. A 1936 Pittsburgh Public Health Survey had sought to put air pollution in the context of other public health problems. The report used out-dated terms to refer to air pollution, speaking of the “smoke nuisance” and emphasizing incomplete combustion as the source of all emissions, ignoring Meller’s efforts to broaden the category of air pollution. Yet the Survey also mentioned dust, smoke, fumes and disease organisms as determinants of air purity. While willing to accept certain narrowing tendencies in the occupational medicine with which air pollution work had become intertwined – dust may or may not be dangerous depending on its type – it fell back on worries about long-range transmission of bacteria dismissed by MISI studies from the teens: polluting dust could carry bacteria over long distances. Free from pressures to limit corporate liability, the report interpreted the new approach to air pollution as a call for a dramatic broadening of environmental
attention in public health. It urged that the Bureau of Smoke Regulation be re-named the “Bureau of Environmental Hygiene” and that its work should focus on air conditions in factories and in the city as a whole as well as on other occupational health and safety issues. Despite effort poured into the problem of smoke and health at Mellon Institute in these years, the 1936 Pittsburgh Public Health Survey would only be able to say that air pollution and health probably had a lot more to do with each other than was generally supposed.217

Attempts like the 1936 Department of Public Health study and the 1938 “Smog and You”218 survey, which placed the health effects of air pollution in a broad, nearly unlimited, context, faced the impetus from occupational medicine to narrowly and specifically define those effects. The quest for specific standards of tolerable exposure to specific pollutants, inherited from occupational health and safety, had disheartening results for the effort to link municipal air pollution and health. In contrast to occupational exposures, municipal exposures produced less dramatic results. Efforts to draw close analogies between the kinds of exposures that would occur occupationally and the kind that would occur in city air were inconclusive. From 1933 to 1935, pathologist and former MISI researcher Dr. Samuel Haythorn had revisited pathology slides of Pittsburghers’ lung tissue to determine whether the particulates imbedded in them were silica. In the end, he was unable to make a definitive determination.219

In 1936, frustrated with the Mellon studies on air pollution and health, Meller focused his attention on work in occupational health for the Air Hygiene Foundation. In April of that year Meller’s assistant, M. A. Yavorsky, summed up the work at Mellon for which Meller had begged funding a few years before. Yavorsky’s report of Mellon
Institute research on air pollution and health from May 1935 to May 1936 was a portrait of frustration. The research was under-funded and workers had difficulty completing animal experiments on exposure to low concentrations of pollutants. They reached no definite conclusions, but Yavorsky claimed that results were suggestive. He reached the sophisticated view that low concentration pollutants disrupted metabolism rather than having acute effects.220

Meller had long held out the hope that if Haythorn were able to conduct a larger survey of the kind of pathological material given cursory analysis in the original MISI investigations, he could once and for all shore up connections between smoke and health. Building on and adding to the data collected since 1912, Haythorn began such investigations in 1935.221 Encouraged by new knowledge in occupational health and safety, he believed he had reasons to suspect a stronger air pollution and pneumonia connection. In addition he adduced the following considerations that seemed to suggest just such a connection: 1. Pittsburgh’s pneumonia death-rate was higher than that of the surrounding country; 2. Both Pittsburgh’s pneumonia and Pittsburgh’s smoke were worst in winter; 3. Sootfall studies showed that the smokiest wards had the highest pneumonia death-rates (Haythorn acknowledged the need to look at all other contributing environmental factors); 4. A high percentage of Pittsburgh pneumonia cases failed to resolve according to the usual pattern and Haythorn pointed to lymphatic blockage by carbon as the most likely cause; 5. Pneumonia deaths rose in Pittsburgh after several days of continuous smog; 6. The Depression witnessed a drop in pneumonia death-rates (in both male and female populations, suggesting that occupational exposures were not the main cause of the disease.)222
Haythorn found the fifth claim easiest to substantiate. He approached autopsy material with all these suggestive results, but was disappointed. He concluded that there was no anatomical evidence of a relationship between pneumonia and anthracosis among non-occupationally exposed groups, but that in the most severe cases of anthracosis there was a change in the way pneumonia healed. After receiving Haythorn’s long awaited results in 1937, Meller seemed to abandon his grand vision of air pollution control calibrated to standards based on precise knowledge about the relationship between air pollution and health. Although smoke and air pollution fellowships continued to be funded at the Institute through 1943, there is no evidence that Meller pursued further study of outdoor air pollution. Meller continued his work on industrial exposures with the Air Hygiene Foundation.

5B.13 Reliance on a Weak Argument and a Scaled Down Solution

Eventually, all of the work at Mellon Institute intended to establish definite health standards as the basis for pollution control – whether under the auspices of the Anthracite Institute, the Air Hygiene Foundation, or the original grants for the study of air pollution and pneumonia – failed. By the beginning of the 1940s, opponents of air pollution relied on the same tired assertions that air pollution probably was much more unhealthy than generally supposed – all the while claiming to have solid public health justification for its regulation. The architects of Pittsburgh’s Renaissance were left without the right to require absolute purity, but also with no established standard of relative purity. In addition, they had no definitive measure, nor even any operational definition of air
pollution. As a result they put in place a law that regulated combustion rather than air quality.

The weakness of the links between smoke and health persisted into the 1940s. In the face of controversies over the effects of smoke control on local industry and local workers, 1940s advocates turned to health arguments as a trump card. Yet, the best the Pittsburgh Medical Society could do in support of the new crusade against air pollution was to issue a statement reiterating old imprecise claims about air pollution’s health effects and to assert that “everyone knows smoke is a health problem.” According to Joel Tarr, County Health Department director Dr. I.H. Alexander would see air pollution control in the 1940s as a “public health crusade.” Yet in his contributions to reports of anti-smoke commissions, Alexander simply reiterated old MISI conclusions about the relationships between smoke and pneumonia and tuberculosis and summarized the disappointing results Haythorn put forward in 1938. Alexander’s strongest argument was to point to what he saw as a significant correlation in the United States Public Health Service multi-city study of smoke and pneumonia: Pittsburgh mortality curves followed the United States Weather Bureau’s cloudy day curves. These results were nothing new, simply the most suggestive of the results that Meller had hoped to confirm through more precise research work.

As Meller’s 1939 American Journal of Public Health article made clear, he took clean air to be a project of a magnitude similar to keeping water or streets clean. Raymond Tucker of St. Louis had used this analogy in his much admired 1939 effort to clean up that city’s air. Yet Meller in 1934 had pointed out an obvious liability for air pollution control in comparison to control of the water supply: it was not possible to
build sewers for air pollutants. Further, neither Meller nor Tucker had any means at his disposal, analogous to water filtration or chlorination, to purify air after it had been polluted. In addition, the perceived inadequacy of available smoke control technology was also due to a greater awareness of all possible pollutants than had been current for water during the Progressive Era establishment of the rubrics for water purification.

By 1939, on the eve of Pittsburgh’s Renaissance, the recommendations Meller was able to make fell short of the expectations he had held ten years earlier. In an article in the American Journal of Public Health Meller urged the use of dust separators on large and medium stacks but still hoped for cheap and efficient dust collection for smaller stacks. He lamented that sulfur emissions were only controllable at the largest plants, but noted that some cities regulated other invisible components such as fly ash. Meller recommended requiring either smokeless fuel or smokeless equipment in intermediate and small (including domestic) plants, but his tone was discouraged, and he complained of public apathy. In the same year Meller addressed the American Society of Heating and Ventilating Engineers. He noted that the sources of city smoke varied dramatically with time of year. He urged control of fly-ash and sulfur gases in addition to visible smoke, and recommended a specific standard of fly-ash per cubic foot. Meller noted that St. Louis now used low sulfur fuel and he regarded this as the only practical way to reduce sulfur emissions in small plants. He acknowledged the difficulties of the regulation of invisible pollution components and pointed to the need to find a “simple way of checking” that a stack met invisible component regulations. Meller wanted to increase the size of his smoke inspection force as would be required to regulate domestic installations, which he now regarded as “in proportion” the worst offenders. Yet, he had
previously balked at the very large size of the force that would be required to actually monitor domestic emissions.230

In the late 1930s, Meller had moved from work on smoke to work in industrial hygiene, and in 1939 the Bureau of Smoke Regulation he had headed was closed – as an end of Depression gesture intended to welcome the return of prosperity. In this same year, Pittsburghers interested in smoke control began to look toward St. Louis’s experiment with air pollution control. That city had recently passed a law requiring that only low volatile coal be burned in city limits. The mayor and city council of Pittsburgh were interested in the St. Louis experiment and sent delegations to the city. In subsequent meetings, local union officials pointed out that Pittsburgh used more than four times as much coal as St. Louis and that the effect on the local coal industry was therefore likely to be much greater than it had been in the latter city.231

5C World War II and After

Pittsburgh emerged from the Great Depression by means of a war production boom. Yet concerns about its competitive disadvantages and lack of economic diversity kept alive fears of economic ruin. Organized labor had changed the political landscape of the city, but Pittsburgh’s elites saw its power as one more symptom of Pittsburgh’s difficult industrial situation. They sought to ensure the city’s survival by engaging in a civic revitalization program with smoke control as its centerpiece. Yet, deep difficulties, particularly within the coal industry made finding an equitable and cost-free solution to Pittsburgh’s problems illusory. The much celebrated Pittsburgh Renaissance would fail
both to reverse the city’s “industrial maturity” and to truly address its broader air pollution problem.

5C.1 “A haze of new smoke”

Pittsburgh was as much a national symbol in recovery as it had been in depression. Nature and newly reorganized labor had brought it new life. Yet, as we will see below, Pittsburgh’s relationship to its coal resources would be mediated through the problematic relations between employers, coal consumers and unions, particularly the United Mineworkers. In the early days of recovery, and into the war production boom, such difficulties still lay in the future. In November 1939 the New York Times published “Steel’s Furnaces Roar” as a celebration of the revival of steel production at the end of the depression. Steel itself, in this article, was taken to be equivalent to Pittsburgh steel. The article expressed no worries about the city’s future or about its living conditions. What went on in Pittsburgh was not a relic of the past; the central illustration of the article was captioned: “Every phase of modern life rests on a framework of steel.” The article began by describing Pittsburgh’s natural setting, taking steel as an essential, almost geographical (and metaphorically anatomical), characteristic: the hills were its “bones,” the rivers its “arteries” and steel its “sinew and lifeblood.” Without steel Pittsburgh was “only another town at a river junction.” As it was Pittsburgh was “the forge of American industry” making “steel for today’s America” on whose product rested “every phase of modern life” in the “steel age.” If steel production slowed “Detroit’s chimneys stand stark and smokeless...wheat prices fall.” No unfavorable comparison to the motor city here: Detroit depended on Pittsburgh.
Now that production had increased with rising demand “Pittsburgh basks in a haze of new smoke.” In the eight months previous to November 1939, steel production had risen from “one third of capacity to almost full capacity.” This was due to the “abnormally low” stocks of unfinished steel held by manufacturers who had “sensed” a coming “widespread upturn.” The article took pains to assure readers that the upturn was not a temporary boom generated by European war needs. Fearing “overexpansion and prolonged depression” like that caused by the World War I boom, Pittsburgh manufacturers claimed to be “concentrating on peacetime business.” The Times contended “it would take a wizard to determine which are the materials for war and which are for peace in these days of totalitarian conflict.”

The article emphasized both the elemental nature of iron and steel production, in which one could see the “very fires of creation, a hell of incandescence.” Yet it called attention to a shift to modern methods: the regulation of the Bessemer blow by means of an “electric eye” which “measures the glow with “microscopic accuracy,” the ingredients “weighed to the ounce,” and “big indicator dials to show the thickness of the steel.” It emphasized the contrast between elemental processes and production for modern civilization: “this Vulcan business of converting iron ore into the tools, the machines, the comforts and necessities of our civilization.” In celebrating modern methods, the article glorified the growth of steel beyond human scale, and as such, beyond the barbarism and high human costs of an earlier industrial era.

Steel is the hero here...even the ingots dwarf mere man. Stand on a high control platform and look down; it is machinery that you see...Men are there, of course, many men. But steel making is no longer the job of hairy apes, men from the abyss who gasp and grow bone-weary from searing heat and back-breaking labor. These men move confidently among their machines, skilled men, many of them...
university men, craftsmen, scientists. Steel has grown up, climbed out of its ancient pit: the sons and grandsons of those who worked in steel in the old days of brute strength are now doing a better job because they have learned more about it.232

Steelmaking was a “vulcan business” dependent on fundamental natural processes, but new technologies had transformed it. Steelworkers were no longer condemned to spend their work days inside a hellish abyss.

At the end of its long discussion of steel-making, the article turned to the city of Pittsburgh itself. It recounted the city’s frontier history. But the frontier story functioned to identify Pittsburgh not as new but as old: “Pittsburgh is an old city, a city that has fed new life, new strength, new vigor to much of America.” The deterioration of Pittsburgh’s living conditions was a sign of its aging: “Smoke filled Pittsburgh’s valleys and the roar of its mills echoed over its hills. Pittsburgh grew older.” Yet the article connected Pittsburgh’s recent civic, educational and scientific advances with the modernization of steel production.

From the technical schools came sons of steel workers, young men with new knowledge, to enrich the science of metallurgy; young men who went down the hills and into the steel plants to make better steel. Steel itself changed, became an alloy, a whole series of complicated alloys with infinite new qualities. But still steel. And Pittsburgh was still Pittsburgh....City of steel... forge of American industry.233

The article was necessary as a reassertion of Pittsburgh’s importance and of the vitality of the nation’s industry as a whole. It subtly dealt with worries about Pittsburgh’s age, its vulnerability to economic fluctuation, and its competitive position relative to other cities. Yet the article warned that Pittsburgh would need to be careful not to let wartime over-expansion (already underway since the United States was supplying weapons for Europe) destabilize its peacetime prospects.
Yet the modernization of the steel industry would not stand in universally for modernization and improvement of the beleaguered city. As early as 1941 national articles focused on Pittsburgh’s efforts at slum reform and urban rebuilding. The smoke problem was central to this national discussion and to local efforts to reshape the city in the aftermath of depression. The newly appointed (February 18, 1941) Mayor’s Commission for the Elimination of Smoke drafted a smoke control ordinance that was to serve as the cornerstone of civic revitalization. It was passed on July 7, 1941, but its implementation for domestic consumers would eventually be postponed until six months after the end of the war.

The chief innovation of the ordinance was its regulation of domestic smoke. The United Smoke Council, an organization founded by civic groups in 1945 to promote smoke control, estimated that domestic smoke was responsible for between 30% and 72% of the city’s smoke problem. To some extent, this wide range of variation reflected the fact that the contribution of domestic smoke was dramatically higher during the winter heating season. While the new ordinance was advertised as regulating all components of air pollution, it was clearly focused on dense smoke. The Ringlemann Chart for the measurement of dense smoke was appended to the end of the ordinance, as an example of a smoke measurement standard. Whether and how much of pollutants other than dense smoke and fly ash were allowed was left dependent on the definition of ‘injury to comfort and nuisance’ to be arrived at by ordinance enforcers. Aside from visible smoke, the ordinance regulated only fly ash to a specific standard. While the ordinance included invisible components of air pollution in its language, and these theoretically could come
from many kinds of sources, enforcement focused on bituminous coal. Issues that had been central to Mellon Institute investigations over the previous thirty years – the broader definition of air pollution, evaluation of its danger to human health and any attempt to set standards beyond those specified by the Ringlemann chart’s measure of visual density – were swept aside in Pittsburgh’s new campaign.

In February 1941, the first article discussing Pittsburgh’s new attempt to eliminate smoke appeared in Business Week. Later that year the New York Times noted the City Council’s approval (July 7, 1941) of the 1941 ordinance, calling Pittsburgh “one of the nation’s smokiest cities.” It described the Pittsburgh law as patterned on a St. Louis ordinance and noted that it was set to become effective on October 1, 1941 for industrial and commercial establishments, and for other coal users on October 1, 1943. The Times said the law required the use of “smokeless fuel or mechanical control equipment.”

Fortune’s December 1941 “Pittsburgh at Capacity,” which was focused on war production, and unionization, expressed skepticism about Pittsburgh’s new ordinance, which it mentioned only in passing. Fortune projected that the new ordinance would “take two or three years to clear the air, if it can be done at all.” The article concluded by describing the display of an evening dress in a Kaufmann’s Department Store window, which the store had captioned: “After dark...dazzling and dangerous in our bituminous black.” Fortune took this as evidence that “Pittsburgh tries to make the best of its civic sore spot.” Smoke meant war production for Fortune: “from the black clouds of Pittsburgh’s bituminous coal smoke come the weapons of total war.”

“Pittsburgh at Capacity” chronicled Pittsburgh’s war production boom but focused on the city’s post-Depression conflicts. Discussion of recent unionization efforts
was central: “Pittsburgh is in the middle of a boom and griping like hell. They say it’s all work and no pay. The executives behind the shiny empty desks look out of their office windows trying to read the future in the smog.” No longer was high production enough to make all elements of Pittsburgh society content, or even to keep them quiet. Pittsburgh had gone for Roosevelt and was now, contrary to long-established tradition, primarily Democratic. The Republican elite worried about the transformation of their industries through the power of organized labor and New Deal tax reforms.

The article did not celebrate Pittsburgh’s new prosperity or contribution to defense, but reported Pittsburghers,’ perhaps inflated, view of them. It discussed the Chamber of Commerce’s “innumerable testaments to the prosperity that had come to Allegheny County” in the form of fatter pay envelopes, halved relief applications, iron production breaking new records and steel production nearly at capacity – the district was producing 42% of the nation’s steel ingots. Yet, despite the war boom, some Pittsburgh industries suffered serious unemployment because the raw materials they needed had been diverted to war production. Even in industries where government contracts had greatly increased business, profits had not gone up accordingly because of the new higher cost of labor and of increased taxes. “It’s not a profit prosperity,” one executive had remarked, “but everybody’s busy.” The article warned that World War II would not yield the “same evidences of prosperity that came out of World War I.”

*Fortune* argued that:

> On the surface this might look like golden times. But there’s a strange feeling of artificiality in the air, a feeling that comes with dim, half-realized forebodings of disaster. Pittsburhgers know that the times are out of joint. Somehow they’re expecting this prosperity to blow up in their faces.
In May 1942, the New York Times reported on the steel industry’s response to the need for war production. The filing location given for the article, “Steel Men Meet War’s Challenge” was Pittsburgh. The article began in the familiar way: “The steelmakers of Pittsburgh whose furnaces never cease to pour out great clouds of smoke...” The open question was whether Pittsburgh, with its outmoded plants, would be able to meet the war’s steel demands. National steel production was already at 99.2% of theoretical capacity. Steel presidents defended the hard work of the men in the mills and asked that they not be criticized. As evidence that the men were working very hard, one steel employer pointed out that at his plant production was up by 12.5% with no increase in capacity. Yet, the Times noted the age of Pittsburgh’s facilities – one steel plant, now making bombs, had been “built in 1897, when the airplane still was a dream of visionaries.” The Mesta Machine Company, which had just “won the Navy ‘E’ and star for its continued outstanding production” was an “old” plant with a 1941 addition. The article described the Homestead Works, at which “ingots are made for the armor plate that goes into the mightiest battleships”:

The No. 2 open hearth plant...is not a pretty place. It is at least fifty years old, with dusty heat-seared girders and planking cluttering up its interior, and even company officials say that, in so far as machinery goes, it is an ‘outmoded’ place.241

Yet the outmoded character of Homestead meant nothing, since in the context of war production it was “one of the most important places in the country.”242 Further New York Times articles, which monitored steel production through Christmas 1942, also were filed from Pittsburgh – the city remained synonymous with the production of steel for the war.243
Labor was valuable and powerful in this context, both because of New Deal regulations according it power and because the war effort depended on its continued over-the-top production. In November 1942, Fortune, in what might be regarded as a companion piece to “Pittsburgh at Capacity,” published “What’s Itching Labor?” focused on the Pittsburgh district.

It should be noted that Pittsburgh is breaking war production records every week. The area was chosen for investigation for precisely this reason; it is not the scene of any sensational labor turmoil. A decade ago Pittsburgh was, of course, a citadel of anti-unionism; today it is a labor town. Its labor leadership, is intelligent, responsible and politically minded. But its workers are not happy yet. What they want and do not want is the subject of the following report.244

Workers wanted “unqualified co-responsibility for the war” – production was as important as military service. Yet, they argued that rather than pay overtime, companies kept production down. Workers contended that the profits of war production should be shared with them. Faced with the argument that new taxes reduced profits too much for this, they responded that “the amount of money we’re asking will go into excess profit taxes anyway...why not give it to the men.” Prosperity was a “Tantalus apple” for the workers.

Fresh memories of depression merge with alarming apprehensions of post-war collapse. The result is nervousness – and the growing desire to get and to hold for labor key positions against the time when, as they fear, the country will have to liquidate its expanded war economy.245

High production coincided with low consumption. Pittsburgh workers resented rationing and the rising cost of living brought by the war since they “hit in reverse proportion to income.” Steelworkers wanted “equality of sacrifice” as should be expected when “sons of Slovak steelworkers share Army tents with the sons of steel corporation executives.” The article predicted that this ideology of equality would be powerful after the war:
“labor will be poised to submit its own ideas of ‘an industrial democracy’ a type of society that gives everybody a vote, not only in running the state, but also in running the plants.” Fortune looked to Roosevelt himself to calm labor’s restlessness in Pittsburgh – to “convince [them] ...that they must mistake neither a war for a boom, nor the coming peace for a depression.”

5C.3 John Wayne as “Pittsburgh”

Many of these wartime themes were drawn together, alongside others important since the 1920s, in a movie titled Pittsburgh released in 1942. In Pittsburgh friends raised in a mining patch must decide whether their futures will be determined by the traditional limits of life there. The choices they make have chiefly to do with competing attitudes toward coal and mining and toward labor organization and occupational safety. While “The Cradle Will Rock” portrayed oppositional relationships between various interests in a paradigmatic New Deal industrial city, Pittsburgh presents a vision of conflicts resolved – melted in the crucible of the Second World War. The story follows two young coal miners “Pittsburgh” (John Wayne) and “Cash” in their rivalry over a coal miner’s daughter made good, “Hunky” (Marlene Dietrich), and in their involvement with a local physician experimenting with coal tar products. “Pittsburgh,” at Hunky’s urging and through ruthless behavior toward his friends, business associates, and the workers in his employ, rises from coal miner to steel boss. When, in addition to having betrayed Hunky to marry his boss’s daughter, Pittsburgh fails to fund further coal tar research and promised health and social provisions for his unionized workers, his friends abandon him. After a violent confrontation with his workers in which Hunky is incidentally
injured, Pittsburgh reevaluates his life. He complains that he “can’t clean up quick” but then embarks on a program to reform himself. He becomes a philanthropist and builds a model town for his workers, but no one will trust this as an honest effort. Pittsburgh despairs, as the war begins, of making anything good of his life. He finds his answer in war work, but only by abandoning his steel magnate identity and signing on, under an assumed name, as a low level worker in his friend Cash’s steel company. The war transforms the man and, we are led to infer, the city. “As weapons of war were forged so were you as a human being” says the voiceover to Pittsburgh (Wayne). Pittsburgh the character and Pittsburgh the city are reformed, transcend old oppositions, and reach new heights of production, employing new, better and waste-reducing technologies, and providing workers with decent living and working conditions.

Competing views of the expected transformation of Pittsburgh as it emerged from the Great Depression are harmonized in the movie. *Pittsburgh* unfolds as a flashback from the early forties war production context under the voiceover of the physician Doc Powers. Powers says that coal in the 1920s was an unrecognized treasure and coal tar, as a waste product, presented a challenge to science. Powers’ rhetoric is in perfect accord with Mumford’s neotechnic themes of encouraging greater attention to efficiency and re-use of waste in characteristically paleotechnic industries. Much of the movie focuses on contradictory meanings of coal: is it the source of future profits through coal-tar research and an escape from the degradation of the miner’s life or is it necessarily connected only with death and smoke? When “Pittsburgh” betrays and is estranged from his friends, it is by refusing to fund their research and by turning his back on his own union workers. This can be seen as symbolic of the historical behavior of the city’s elites. After the crisis,
“Pittsburgh” vows to reform and, as an anonymous workman, pulls together with his old friends in a glorious orgy of war production and union democracy. Local labor and local nature (transformed by neotechnic means) remake the city.

The movie unified the expectations of technological salvation expressed in Ladies Home Journal, and at the Mellon-sponsored conference on the future of bituminous coal, with the faith in labor exhibited by Cradle, the Klein study, and “Is Pittsburgh Civilized?” Even Haniel Long and Eleanor Graham could have seen their hopes for Pittsburgh’s rebirth realized in it. In the end Pittsburgh portrays a happy coincidence in war time between greater production, greater profits shared with unionized workers and local natural resources put to new modern uses. No jobs are lost, relations between union and management improve. “Pittsburgh” the character and Pittsburgh the city are reformed and transcend old oppositions. All boats rise on the Three Rivers. The architects of Pittsburgh’s revitalization, and especially, its smoke control efforts, predicted a similar happy coincidence in the immediate post-war period.

5C.4 “Pittsburgh’s New Powers”

According to articles in national magazines, the municipal government and influential Pittsburghers had ambitious plans for after the war. Willard H. Buente, Chief Engineer in Pittsburgh’s Department of City Planning, outlined “Pittsburgh’s Post-War Program” for American City in March 1943. The planning had begun less than two months after Pearl Harbor. The article discussed public works projects to reduce traffic congestion, and to make Pittsburgh’s Point into an historic site. Pittsburgh’s Mayor Cornelius D. Scully acknowledged the anxiety spoken of in the 1941 Fortune article and hoped that
appropriate city planning would prepare the city for “far-reaching post-war re-
adjustment.” In September 1942, the New York Times had published an approving
article on Pittsburgh’s new smoke ordinance: “Cities Are Curbing Unnecessary Smoke –
Pittsburgh Acts to Stop Soft Coal Nuisance.” The article reported on the views of Herbert
U. Nelson, executive vice president of the National Association of Real Estate Boards,
who applauded Pittsburgh’s ordinance adoption. The article asserted that “[p]rior to
enactment a citywide campaign was conducted to ascertain the costs of unnecessary
smoke upon health comfort, realty values and also on taxes.” This predicted a “30 per
cent saving in cleaning bills” if the smoke were eliminated. The Times claimed that while
smoke ordinances weren’t new, “effective enforcement” was. By mentioning MISI
surveys of the cost of smoke damage, the article made new smoke control efforts
continuous with what had gone before.

Both new and old smoke abatement efforts relied on Mellon initiative. The
Mellons themselves had extensive post-war plans – for Pittsburgh and for their own
business ventures. New business initiatives by the Mellon family got national press, and
the Mellons maintained national visibility by taking decisive action in the 1940s. Richard King Mellon, son of Richard B. Mellon and nephew of Andrew (both of whom
had died in the 1930s) was now in charge of the family business. After returning from
military service, R. K. Mellon began to reorganize the Mellon interests, first by
establishing T. Mellon and Sons as a nonprofit holding company to consolidate the
“younger Mellon interests in Pittsburgh” and to study “technical, social and economic
affairs – potentials for new investments.”
Mellon business reorganization made possible further forays into globally distributed neotechnic industries. Yet it also, through their local banking business, tied them more strongly to Pittsburgh. This consolidation soon resulted in the merger of Mellon Bank and Union Trust, which represented the Mellon’s corporate holdings, to form the Mellon National Bank and Trust. Mellon Bank and Trust would become “Pittsburgh’s first “$1 billion bank.” It would be the sixteenth largest in the United States and it intended to compete stiffly with the nation’s largest banks for “a bigger share of the nation’s industrial loans.”253 The family also merged Mellon Securities with the First Boston Corporation, to create the country’s largest investment banking firm, allowing the Mellons to “step out into new investment fields.”254 In addition, the Mellons also merged the Mellon Indemnity Corporation into the General Re-insurance Company. They had already merged their Pittsburgh Coal Company and the Rockefeller-controlled Consolidation Coal Company into Pittsburgh Consolidation Coal – “by far the biggest commercial coal operation in the world.”255

Consolidation was preparation for expansion into new investments. Neotechnic innovations would be as central to Mellon expansion as they had been in the 1880s when “a modest investment in that struggling little company attempting to manufacture aluminum led to Alcoa” and during World War I when “a $300,000 stake in byproduct coke-oven patents grew into Koppers Co.”256 The Mellons expected even greater technological opportunities to be available in the war’s aftermath. By 1947 Mellon assets (not counting their First Boston securities corporation) were worth three billion dollars, making “the Mellon empire...one of the largest working fortunes in the Western World.”257 Richard King Mellon summed up the new efforts: “We’re going to work
again.” The Mellons, and their army of allies and underlings, would be working not only on building the Mellon fortune but on revitalizing the city of Pittsburgh. Smoke control would become the centerpiece of this program.

By 1946-47 Pittsburgh’s place in the national imagination as the apotheosis of war production and a hotbed of labor activism was enriched by its new image as exemplar of urban decay – and – just perhaps – as a crucible of urban reform. The Saturday Evening Post published “The Cities of America – Pittsburgh” in August 1946. The article was one of a series of eighteen pieces on “America’s Most Colorful Cities.” The article began by announcing:

Symbol of America’s industrial might, scarred by generations of economic strife, butt of a million jokes, Pittsburgh has at last decided to do something about removing its filth and slums, and regilding its reputation.

According to the Post Pittsburgh was not a city partaking in the normal relations of human beings with the natural world: “Spring comes to Pittsburgh not when the first strawberries grace her table nor with the blush of the earliest rose...but when the first strings of gondola cars...bloom red with the season’s first Mesabi ore.” Pittsburgh was “that fruitful filthy monster” – again not natural but monstrous – a perversion of nature. The article celebrated Pittsburgh’s contributions of the materials of war from 1812 to World War II but noted “whether in peace she creates more wealth than certain of our other great regions, would be interesting and possibly tactless questions.” The article pointed to the vulnerability inherent in Pittsburgh’s lack on industrial diversity:

Since her industrial eggs are so highly concentrated in one brittle steel basket, a break in the steel market or a prolonged strike in the steel mills bangs this old town, whose banks during the depression burst like balloons in a shooting gallery, square in the solar plexus. There is a definite shift of the steel-consuming industries from the Pittsburgh region to the south and westward.
It also mentioned Pittsburgh’s “strike-happy” unions, and its difficulties with traffic congestion, flooding and river pollution. Recounting all these troubles, it called Pittsburgh a “municipal plunderbund” whose nights were “lurid and...days turgid with smoke.” The article called housing the worst problem of all, a crisis since the 1830s, in a state of shortage since the 1890s. It tied smoke closely to poor housing conditions: referring to a Groucho Marx joke about smoke rings reminding him of living in Pittsburgh (“if you can call that living”). The struggle to live in the smoke was “a hellish, tormenting, disease-abetting, and spirit-wilting thing.”

With all these problems, Pittsburgh was fearful of losing population now that “hordes” of desperate immigrants “fleeing destitution” were no longer ready to “eagerly settle in any spot in America that offered them a job.” Pittsburgh was made more vulnerable to population loss by post-war affluence: “the nation is, at least for the time, so rich that its people relocate themselves as much on a basis of the attractiveness of living conditions as on that of economic opportunity.” The article pointed out Pittsburgh’s vulnerability to this state of affairs at a time when

20 percent of America’s productive plant is “floating,” seeking to locate or relocate, and when no expert is needed to point out that these plants can’t go where people, among them plant executives wives, won’t live.\(^{263}\)

In addition, ordinary Pittsburghers had been exposed to the wider world during the war. The article quoted a “young Pittsburgh veteran” as saying: “We are like the old mule that was finally brought out of the mine. We have just found out there is such a thing as daylight.”\(^{264}\)

Since Roosevelt’s 1933 “labor revolution” the municipal government had been “the GHQ of the liberal labor junta” and the Chamber of Commerce the “embattled
citadel of ‘the interests’,” according to the Post. Fearing post-war population and industrial decline, these warring factions had begun to cooperate. The article quoted a speech by new Democratic mayor David Lawrence to the Chamber of Commerce in which he dismissed labor and liberal caricature of the Chamber as “stuffed shirts [with] phony statistics” and as “economic royalists bent on grinding down the face of the poor.” Lawrence invited everyone to “join...[him] on the Pittsburgh team” to rebuild the city in its “critical era”. The article claimed that the independently wealthy Lawrence saw in post-war Pittsburgh the chance to “be the greatest mayor Pittsburgh ever had.” The Post boldly predicted “There is good reason to believe that Pittsburgh is in the beginning stages of one of the most dramatic periods of municipal renaissance that any great American city is likely to undergo in the next decade.”

The Post summarized Pittsburgh’s history, focusing on the progress of labor. The article moved quickly from the 1892 Homestead strike to be the United States Supreme Court’s 1937 validation of the Wagner Act. It followed by recounting recent history. John L. Lewis “without spilling a drop of blood” had “signed a union contract with Big Steel.” A contract with “Little Steel” including Pittsburgh’s 30,000 employee Jones and Laughlin Steel Corporation soon followed. Municipal politics and, as we will see below, economic life, were now tightly bound up with labor activism. Current CIO president Philip Murray was a friend of labor-liberal mayor and Democratic machine boss David Lawrence.265

The power of labor, celebrated by the Saturday Evening Post, could paralyze the city, however, and make threats of decline more intimate. Time began an October 1946 story:
A postcard mailed in Washington to “New Ghost Town, Pa.” last week, did not make the postmen think twice. It was promptly delivered in Pittsburgh.\textsuperscript{266}

The postcard was delivered in the fourth week of a Pittsburgh power strike. The power strike led to a return to “big smoke-gushing boilers, supplying heat to office buildings” and steam locomotives used as sources of power. The strike had put 50,000 people out of work. In this case increased smoke was certainly not associated with prosperity.\textsuperscript{267}

Newsweek in the same month offered a chronology of the effects of strikes on Pittsburgh. The chronology, embedded in an article on the current coal strike focused on a national level “showdown” between John L. Lewis and the government. It called Lewis “the immovable object” and the U. S. government “the irresistible force”. The government despaired of using the courts to compel the miners to go back to work admitting that legal action was “not going to produce any coal.” Newsweek continued “John L. Lewis’s brownout cast the nation in shadows.” The coal strike even affected the electricity that powered lights at the White House – the lights were dimmed for Truman’s Thanksgiving dinner. The president traveled to the Thanksgiving weekend Army-Navy game on a locomotive powered by electricity produced by “water power not coal.”

According to Newsweek,

Because Pittsburgh is both the citadel of King Coal and the steel capital of the world, the repeated walkouts in these two basic industries have hit it sooner and harder than other major American cities.\textsuperscript{268}

With the coal strike: “the urban symbol of American preeminence in heavy industry was being paralyzed” for the fourth time in 1946. In winter 1946 the city saw a 26-day steel strike affecting 125,000 CIO steelworkers and reducing production to 3% of capacity. In Spring 1946 the region faced a 59 day coal strike of 59,000 AFL miners, which reduced
steel production to 29 percent of capacity. Fall 1946 witnessed a 27-day power strike of 3,200 Duquesne Light employees causing transportation disruptions and power brown-outs. The city also endured a 115-day CIO strike at Westinghouse and a 53-day AFL hotel strike as well as bus strikes and 81 other “work stoppages.” Newsweek blamed John L. Lewis for “once more cut[ting] off the fuel that makes Pittsburgh great, the fuel without which its industries cannot live...” United States Steel’s biggest operating subsidiary dropped production from 104 percent of theoretical capacity to 35 percent during the strike. Other mills, mines and factories in Pittsburgh also cut production: “unless the coal walkout was settled, 250,000 workers in the Pittsburgh area might be idle by Christmas.” All David Lawrence could do was to “impose a worse-than-wartime dimout” and cut electricity consumption in public buildings. The other pole of potential power in Pittsburgh, the Chamber of Commerce, boasted that despite drops in business activity to 1936 levels with previous strikes, in each case “business had bounced higher than before.” The Chamber claimed to know of no business that had moved away because of strikes.

Although Pittsburgh had been a “Democratic stronghold” since 1932, the region voted Republican in the 1946 Pennsylvania gubernatorial and senate races due to dissatisfaction with labor unrest. According to Newsweek, “to the individual steelworker, the first year of peace had been an economic disaster.” Ignoring strike demands, Newsweek turned to strike costs. Money saved by workers during the war production boom had been depleted during the strike. Retail business in milltowns was down about 20–25%. Newsweek quoted one worker as saying “If the government can’t control John
Lewis, what can we do about it?” This difficult year, 1946, was the first year of Lawrence’s first term as mayor. Lawrence and the Mellons developed their plans for the Pittsburgh Renaissance in the context of these dramatic assertions of labor’s power. Fortune’s “Pittsburgh’s New Powers” from February 1947, like the Newsweek article from the previous October, began by lamenting the difficulties of Pittsburgh’s 1946 power strike. Visiting Pittsburgh during the power strike was like a visit to “some darker century” – Pittsburgh here was again a city of the past. Yet the power strike also suggested the “ice age [stagnation brought on by industrial maturity] projected by the gloomier prophets of industrial paralysis.” Both images connected labor unrest to Pittsburgh’s larger “worries,” on which the article would dwell. Pittsburgh was “the capital of big labor, the birthplace, headquarters, and testing ground of the mightiest C.I.O. union.” The strikes of 1946 in other cities had “nothing like the basic force and continuity” of those in Pittsburgh. Fortune saw union struggles as a part of the industrial maturity that threatened the city’s very survival. Escape from depression into industrial maturity, which had given rise to it, was no escape at all.

Pittsburgh is worried. It is worried about the shift of steel to the West and the decentralizing pattern of post-war industry. It is worried about the dwindling markets in bituminous. It is worried about its continued imbalance of heavy industry and its failure to attract more diversified, lighter industry to the area. It is haunted still by the memory of the late great depression, the idle men in the streets, the streets greasy with river damp. The balance sheets look good now, and, if all goes well, it can look forward to three or four years of boom production filling the world’s banked-up needs for peace-time durable goods.
These worries impelled “the industrial elite” to “initiate and push a broad-scale civic-improvement program.” Fortune identified elite citizens with the city itself – they were worried and they would solve Pittsburgh’s problems.

This may be Pittsburgh’s last chance, to reverse the course of urban decay and industrial decline – and considering the chafing unrest of urban industrial populations everywhere, it may be none too soon.271

Elites who saw only danger and backwardness in strikes, and who had lamented the profitless recovery, were set, once again, to meet social and economic demands with environmental solutions. Even R.K. Mellon appeared to take Pittsburgh’s labor situation seriously. Mellon was convinced that it was no longer possible to accumulate wealth using the “individualistic methods of our grandfathers.” In order, even, to safeguard fortunes already made, it was necessary to attend to workers’ demands: “if they don’t get what they want under our system, they’ll be fooled into believing they can get it under another.” Fortune celebrated the new generation of Mellon-installed executives and their work in the public-private reform commission, the Allegheny Conference on Community Development. Richard King Mellon had helped to form ACCD on the basis of a plan brought to him by a former New Deal planner who served as his aide in 1943 when he was director of the Pennsylvania Selective Service. Mellon and Lawrence would work closely together on the commission. Republicans held the money and Democrats the votes. A South Side politician would later speak of redevelopment in language worthy of a Magee-Flinn crony: “This means jobs and dough for everybody...It’s a marriage of convenience in which nobody’s getting rooked.” Fortune noted, however, that “Big names in labor” were “conspicuously absent” from ACCD committees.
The article emphasized the Mellons’ “strong family attachment” to the city: They “believe[ed] in putting all their eggs in the Pittsburgh basket and watching the basket.”273 This desire to closely supervise family investments motivated the Mellons to locate the headquarters of $650 million Gulf Oil and $80 million Koppers in downtown Pittsburgh. Yet, Fortune attributed the failure of the city’s six previous master plans to a lack of Mellon leadership in previous generations. While it remained true that “nothing in Pittsburgh moves without the Mellons,” the family’s new generation was committed not just to living and working in Pittsburgh but to rebuilding the city itself. R. K. Mellon was president of the Pittsburgh Regional Planning Association and now tried to involve even business rivals in such efforts. Nonetheless, revitalization initiatives were closely connected to Mellon corporate objectives and the Mellon corporate network.

Among the newly appointed Mellon executives, pictured, one by one, in the Fortune article, was George H. Love of Pittsburgh Consolidation Coal. Love had come up with “an aggressive program to modernize the mines and put real money into long-neglected research for new markets, particularly chemical and synthetic products.” This action was much like the program “Pittsburgh”’s friends Cash and Hunky hoped he would undertake in the 1942 movie.274 Nonetheless, a struggle with the city’s relationship to coal would be the first trial for the Mellon-backed Allegheny Conference on Community Development.

The conference met its first big test of power on smoke abatement, a project almost first on the list....There was a knockdown battle over the date and order in which control should take effect. The coal interests were all for postponing it indefinitely....[S]mokeless stokers and other equipment for burning [Pittsburgh coal] more efficiently were in short supply: if enforcement were clamped down, Pittsburghers might switch to other fuels. It finally took a call from the top Mellon office to remove the obstruction.275
The legislation passed with definite dates as Mellon insisted. (Enforcement of the 1941 ordinance had been postponed because of the war and was now being rescheduled.)

In January 1947, a month before publication of the Fortune article, Pittsburgh was one of three municipalities featured as Business Week surveyed various cities’ peace time plans.276 The Econometric Institute of New York City had just released a 700-page report on Pittsburgh’s industrial position and prospects. The report, commissioned by the Chamber of Commerce, the Pittsburgh Civic Business Council and the Allegheny Conference on Community Development argued that Pittsburgh was “run down physically” because it “developed as a place in which to work rather than to live.”

Business Week, like Fortune, emphasized Pittsburgh’s over-concentration in heavy industry. It noted that the 11-county Pittsburgh district concentrated 53.6% of its employment in the iron and steel industries. Fortune complained that Pittsburgh had lost its share of the automobile parts industry in the 1920s because of its “obsession” with maximizing tonnage of raw steel. Now, U. S. Steel was “building heavily on the West Coast,” National Tube was predicted to leave nearby Ellwood City for the Midwest, having developed a new process for making continuous tubing, and Westinghouse had already spread its operations over many different localities, recently moving its motors division to Buffalo. Alcoa was moving several divisions from the area. “Older and heavier” plants remained in Pittsburgh “vulnerable to every cyclical slump and technological change.” Big Steel was too heavily invested in the city to leave, but attracting new lighter industry (light-metal fabrication, light electrical equipment, chemicals, plastics, and textiles) was essential to Pittsburgh’s economic stability.
Both business magazines placed Pittsburgh at a crossroads and portrayed environmental revitalization as Pittsburgh’s path out of the woods. *Business Week* quoted the Econometric Institute’s widely divergent employment projections. Available employment was to depend on the success of the urban revitalization program pushed by Lawrence and Mellon.277 Smoke control would be a valiant first step toward “better living conditions” and “industrial rejuvenation.”278 Yet, *Fortune* concluded by adverting to Pittsburgh’s historical uniqueness. Pittsburgh had been “in its time the great generator of romantic prose and strong epithet” – “hell with the lid off,” but also the city Frank Lloyd Wright had condemned: “It’d be cheaper to abandon it.” Nonetheless, *Fortune* called attention to Pittsburgh’s experience as a harbinger of things to come for the whole country:

> what is happening now in Pittsburgh is a foretaste of what is in store for other, younger industrial centers a little further along in time. Pittsburgh is the test of industrialism everywhere to renew itself, to rebuild upon the gritty ruins of the past a society more equitable, more spacious and more to human scale.279

So Pittsburgh had gone from being a new city characterized by a behind-the-times frontier primitiveness to an old city characterized by an ahead-of-the-times late industrial malaise. Yet, it was now expected to lead the way out of industrial maturity to civic rebirth, and smoke control was to be its first step.

**5C.5 The Shift to “Laborless Fuels”**

In the same month (February 1947) *American City* summarized the *Fortune* article’s discussion of the Mellon-backed revitalization program. The article concentrated mainly on optimistic points in “New Day Dawning for Pittsburgh” but did quote *Fortune*’s view
that this might be Pittsburgh’s “last chance.” Articles from this point on focused on hopes for Pittsburgh’s rebirth. Beginning in fall 1947, Pittsburgh’s smoke reduction became big news, with other civic renovations taking second place. Business Week reported on the first two weeks of the enforcement (delayed until after the war’s end) of Pittsburgh’s smoke law. Domestic furnace restrictions, effective on October 1, 1947, had a “Smoggy Debut” according to the article. Lack of smokeless fuel and smoke abating equipment had hampered compliance. The article reported the “thick natural fog” that masked any improvement resulting from the law in its first week; it also looked to passage of a smoke law covering all of Allegheny county as a necessary condition of real improvement. The city’s force of 13 smoke inspectors concurred with United Mine Workers’ predictions that the supply of domestic stokers and smokeless coal would fall short of the demand created by the ordinance.

During these years of smoke control’s final implementation, conflict raged about whether the problems of the coal industry and of miners were due to John L. Lewis and the United Mineworkers union or to the smoke control law itself. Was coal consumption declining because of smoke control or because of supply interruption due to strikes and high costs related to due to new union demands? In September 1947 the first labor leaders came out in favor of smoke control but they were, significantly, steel workers rather than coal miners. In its article on Pittsburgh smoke control, Business Week reported on the difficulties in the implementation of Cincinnati’s smoke ordinance (effective May 1947), and the successes of the St. Louis ordinance, which had brought about a decline in the number of hours of dense smoke every year since the winter of 1940-41. Business Week
argued that the costs saved by eliminating smoke damage (not by fuel savings) should convert “protesters among the soft coal interests.”282 Jack Vogele, a member of the “Coal Producers Committee For Smoke Abatement” from Cincinnati, Ohio remained unconverted. He criticized Business Week’s reiteration of the expectation of a “‘push button’ method of clearing the air over our cities.”

In Pittsburgh, coal companies had argued for a smoke control law that depended on cheap smokeless combustion technology then under development by their researchers, rather than on fuel substitution. During the 1940s, however, it had been hard to develop air pollution technology due to shortages of materials and labor. By 1945, the smokeless stove, which was to have made smoke control painless for the poor, was behind schedule. It would not be developed in time for the enforcement of Pittsburgh’s ordinance on domestic consumers.284 Coal dealers now decried claims of abatement success as a smokescreen. Vogele asserted that St. Louis had claimed for six years to have eliminated smoke but that these claims must have been “ridiculous,” since only an eighth of the coal consumed in St. Louis had been replaced by low-volatile coal and the volatile content of that coal was only a third less than that of the bituminous in use before. He claimed that airplanes still sometimes could not find the St. Louis airport due to smoke and that smoke palls could still be photographed – even on days “when no domestic heating plants were in operation.” The coal producer said:

In the case of Pittsburgh, the industrial plants and the steel mills burn upwards of 20-million tons of coal. The domestic consumer uses approximately 2-million tons. To carry this idea to a ridiculous conclusion, does anyone seriously believe that if a law were passed prohibiting heating plants in the home in Pittsburgh so that by no stretch of the imagination could there be any smoke emitting from them, that there would be any appreciable difference in the atmosphere of Pittsburgh?285
Vogele claimed to be part of “a committee which has worked in over 70 cities in an attempt to help municipalities abate their air pollution.” He concluded: “The abatement of air pollution is a complicated and long-drawn-out program and the sooner this fact is understood by everyone the sooner progress will be made...”

The fate of bituminous coal was a major issue in deliberations about the new smoke control ordinance of the 1940s. In response to coal operator and miner – fears that smoke control would bring a tremendous loss to the coal mining business, smoke control proponents in 1943 predicted that local coal interests would lose business equivalent to “only” 3% of national output due to the new law. Proponents of smoke control like councilman Abraham Wolk argued that smoke control would create rather than eliminate industrial jobs and jobs for miners. Wolk and others promoted the development of new coal processing industries based on local bituminous coal. Processed smokeless fuel from local coal, coal tar products, and coal gasification were to help the coal industry to recover lost market share while allowing for elimination of the city’s characteristic smoke.

The Mellons themselves would develop a unified plan to promote smoke elimination, mollify the United Mine Workers, and bring their coal investments into the neotechnic realm occupied by their other industrial interests. In September 1948, Business Week reported on these Mellon efforts. Consolidation Coal Company had established a smokeless fuel plant in Pennsylvania to make the fuel “Disco” to feed Pittsburgh’s furnaces. The plant employed a continuous process in which the coal was treated at 1,000 degrees F allowing for the extraction of by-product gases and coal tar. Another Consolidation Coal effort, undertaken jointly with Esso Standard Oil, was a coal
gasification program, which was to “mean unlimited possibilities for Pittsburgh’s economy.” Such efforts would fall far short of the economic and environmental roles claimed for them.

The definitive decline of Pittsburgh coal in the late 1940s and 1950s was interpreted by local newspapers as a triumph of “laborless fuels” such as oil and natural gas. Coal’s early difficulties were often due to strikes, beginning with the major coal strikes of 1919 and 1922, and the anthracite strike of 1925-26. By 1945 coal had fallen on hard times due to the replacement of steam locomotives with diesel-electric power. As miners complained about these developments, coal merchants expressed their fears of competition from natural gas to be piped through the Big and Little Inch pipelines, originally built to transport oil for war production.

Controversy with miners’ unions persisted throughout the period of the debate over the enforcement of smoke control. In 1946 the United Mine Workers had complained that miners were vulnerable to competition from other fuels and to the change in fuels instituted by the railroad companies. They argued that because coal was vulnerable from these quarters, Pittsburgh’s not yet fully enforced smoke law should be amended to protect the coal business and miners. Yet by this time (1946) newspaper editorials dared to promote gas to be supplied through the Big and Little Inch Pipelines as a desirable domestic fuel for Pittsburgh. In 1947 coal interests tried to delay the use of the new pipelines and the coal industry and the railroads together tried to postpone enforcement of the smoke ordinance in order to help coal, but in March of that year, their opposition was over-ridden by the Pittsburgh city council. During 1946-47 local commentators blamed John L. Lewis and the United Mineworkers for coal’s loss of the
local domestic fuel market to gas. Between 1947 and 1949 controversy raged over the
shift to natural gas. Miners’ unions complained, though their representatives had
eventually joined the commissions responsible for the smoke law. The newspapers
blamed miners’ strikes rather than the smoke law or the coal industry at large for coal’s
difficulties. In 1948 railroad coal handlers joined miners in losing jobs to the railroads’
conversion to diesel. They threatened a national strike by 1949. Miners promoted plans
for coal gasification, but these were abandoned as unprofitable by local corporations by
1950. The *Pittsburgh Press* blamed John L. Lewis for this development as well and
proclaimed that coal had lost out to “laborless fuels.”291 By April 1950, after the
enforcement of the smoke law in the late 1940s, the Mellons’ Consolidation Coal,
Pittsburgh’s largest coal company, was forced to cut prices in response to competition.292

5C.6 “Pittsburgh comes out of the smog”

The complexities of smoke abatement and its connections to the future of the coal
industry were lost on the national press. Perhaps this was due in part to publicity efforts
by the ACCD. National magazines celebrated Pittsburgh’s heroic efforts, even before
they had tangible evidence of smoke control’s effects. *Newsweek’s* October 13, 1947
“Clearing Pittsburgh’s Air” recounted Pittsburgh’s smoky history: the early nineteenth
century complaints of “sulfurous vapors,” the ‘Smoky City’ title, the blackened lungs,
the soiled white shirts and lace curtains, the loss of sunlight, unbelievable sootfall, the
smog-making fog inducing noon-time blackouts.293 It evoked the old images: “In the
portrait gallery of American Cities Pittsburgh was represented by a husky steel worker in
grimy overalls, puffing a bituminous stogie.” It saw the ordinance’s enforcement as
Pittsburgh’s effort to “quit smoking.”294 In December 1947 Life magazine ran a brief illustrated article, “Smoke Sleuths,” with impressive pictures, on Pittsburgh’s efforts at smoke elimination. The article’s first photo was a smoke inspector examining a stack with the use of a paper smoke chart. The article referred to Pittsburgh’s century-long bitter but ineffective campaign” against smoke. The Bureau of Smoke Prevention had just jailed a coal dealer for selling raw bituminous (presumably to someone without proper abatement equipment). Other photos contrasted the emissions of a locomotive with and without steam jets for smoke abatement, and depicted the city with and without “smog.” The ordinance would “give the city [a] majority [of] days like [the] one shown below when usual smoke pall was carried off by wind.” The article also showed a department store merchant comparing a clean shirt with a blackened one which had been displayed in a department store window for two weeks.295

In January 1948, Commonweal called Pittsburgh’s redevelopment initiative “[o]ne of the most spectacular of the year’s-end new stories.” The article focused on the whole program led by “local industry” but prominence mentioned freedom from smoke. It claimed that the program was “not directly aimed at forestalling a slump” but “comprises the tasks which all agree must be completed in the interest of the community whether times are good or bad.” Commonweal was not an important enough magazine to have been manipulated by Mellon forces in printing such a story, yet it was reacting to wider press coverage which may well have been Mellon production. Its particular concern was with social welfare and with worries arising from the memory of the Depression, an important factor in the psyches of its Catholic and therefore largely Democratic and immigrant-descended readership.296
Despite its initial skepticism, Business Week was among the first to claim that Pittsburgh’s new anti-smoke efforts were succeeding. In September, 1948 it claimed that Pittsburgh’s skyline “once almost continually dimmed out by soot-filled haze” now “show[ed] up boldly against the horizon.” It illustrated this with a picture of the city taken from Mount Washington, once Coal Hill. Pittsburgh looked to a greater availability of smokeless fuels to keep skies clear through the winter heating season.297 A month later, in October 1948, American City’s “Our Municipal Notebook” section actually published a poem about Pittsburgh’s cleanup which had been inspired by a Wall Street Journal Report: “Pittsburgh’s victory over smoke inspires 200 other communities.” The doggerel began:

The streets of Pittsburgh now are clean,
The grass of Pittsburgh now is green,
The sky of Pittsburgh now is blue,
At night, the Pittsburgh moon winks through;
Gone is the smog that made unpretty
The town yclept “The Smoky City.”

The poem listed

Communities both near and far –
From L. A. (Cal.) To Zanzibar,
From Gary, Boston and New York
To Halifax and County Cork —

that had been moved to smoke abatement action by Pittsburgh’s example. American City had contacted the chair of Pittsburgh’s City Planning Department for advice about whether to publish the poem. The official, Frederick Bigger, qualified the claims to “smokeless perfection” by talking of the need to control air pollution from out in the county, but said that his own subjective judgements, and the fact that buildings were being cleaned that had not been cleaned for years, attested to the real improvements in
the air. This article carried a pointer to another article in the same issue, “Towards a Cleaner and Brighter Pittsburgh,” which featured other aspects of the Pittsburgh cleanup that went “[h]and in hand with Pittsburgh’s subsequent progress towards smoke elimination.”

Yet letters to the New York Times, written in the context of debate about what should be done about smoke in New York City itself, cast doubt on claims of success in Pittsburgh. Letters argued that “it appeared to be a matter of controversy as to whether the statutes presently in force were working out successfully” in Pittsburgh and St. Louis. One of New York’s proposed anti-air pollution bills was to be modeled on the Pittsburgh law. Pittsburgh was “a city where soft coal is the predominant solid fuel” and the law “seems to take it for granted that the smoke nuisance is caused by soft coal and only soft coal.” New York City, on the other hand, had an acknowledged pollution problem from the burning of fuel oil. The letter writer wanted to be sure that all fuels were covered by any ordinance. Linked to coal dealers, the letter writer was John Schreiber, the Coordinator of the Retail Solid Fuel Industry in the City of New York. Schreiber also criticized the Ringlemann chart since it “requires expert testimony and the instructions for its use are so precise and the gradations in its density are so slight that a good lawyer by vigorous cross-examination can readily create in the mind of the City Magistrate a reasonable doubt about the defendant’s guilt.” Instead he urged that convictions be based on “testimony of smoke so dense it cannot be seen through at the point of emission for at least two minutes.” These had been “sustained consistently by the appellate Division and in one instance by the Court of Appeals.”
Business Week in March 1949 published a long article extolling Pittsburgh’s revitalization: “Pittsburgh Remodels Itself.” The article first emphasized new executives and new industry and secondly improvements in living conditions. Smoke control was an emblem of civic and economic progress: “some think” the sun shining on the city is a “symbol of the sunny outlook for the coming years.” Business leaders were cautiously optimistic with caution predominating over optimism. Such optimism also rested on “a new spirit of teamwork” of which “smoke elimination” was “just one example” of what could be accomplished.

Business Week claimed that the ACCD had “c[o]me to grips with Pittsburgh’s basic economic dilemma” – its overdependence on steel. Such overdependence had been less problematic “back in the days of Pittsburgh Plus, when industry was heavily concentrated in the Northeast and all steel was priced as if it were made in Pittsburgh.” After the demise of Pittsburgh Plus in the mid-1920s steel-consuming industries moved to the south and west, closer to steel markets, giving Pittsburgh an increasing disadvantage in transportation costs. The Federal Trade Commission had then ruled that the steel user had to pay the freight on his own orders, therefore motivating him to buy from the closest source. Given Pittsburgh’s distance from markets and the illegality of its bearing the differential freight charges itself, Pittsburgh steelmakers were expected to suffer once wartime demand had subsided. Yet it appeared that this “basing point pricing” was having the reverse effect of bringing steel consumers to the steel producers. So far 50 new businesses had come to Pittsburgh for this reason.

The president of U. S. Steel applauded the arrival of steel consumers as a contribution to the diversification of Pittsburgh economy. One challenge was the
availability of industrial sites – usually best located on flat land near the river. Greater availability would depend on flood control – part of ACCD’s revitalization program. Pittsburgh also wanted to sell itself as an industrial location independently of the pricing decision. Its selling points were cheap power from nearby unlimited coal fields, and good transportation facilities. But proposals to override Pittsburgh’s advantages by, for instance, linking Lake Erie and Youngstown by conveyer belt, worried Pittsburgh steelmakers.

The article sounded the old refrain about the connections between improved environment and economic diversification: “to attract new industry, they must make their rather grim workshop a pleasanter place in which to live and do business.” It claimed that the ACCD had “proved” “that the civic problem [could] be solved” by pushing smoke control, in city and county, establishing flood control and improving highways, making use of existing agencies to carry out its own proposals. The ACCD had had to fight hard to get enabling legislation for its projects through the Pennsylvania State legislature. Now Jones and Laughlin Steel, Westinghouse, Duquesne Light, West Penn Power and H. J. Heinz were engaged in new plant construction, and Alcoa and U.S. Steel and Mellon Bank together were building new skyscrapers. Retailers had seen increased sales between 1945 and 1948 and the Knott Hotel Chain planned a new downtown office building.

The article admitted that there was still “a darker view” of Pittsburgh’s future, still vulnerable to any sudden economic shocks to steel. Unemployment remained a serious problem. Housing efforts so far had not yielded much. New industries, including processed coal, were expected to help solve employment problems, yet, as we have seen, these hopes for coal would amount to little. Nonetheless, some worried that Pittsburgh,
with the addition of its new steel-consuming industries, was still dependent on “too much metal.” Metals now made up 63% of its economy. But Business Week claimed that “a steel economy is here to stay” and is “safe so long as it can attract plenty of fabricators around the big steel mills.” This would “keep the dinner pails full for the nearly 2-million people living in the four-county area.” The article concluded: “the metal’s there. Why not concentrate on polishing it?”

5C.7 “Workshop of the Titans” and Alchemist’s Laboratory

In July 1949 National Geographic published a major article: “Pittsburgh: Workshop of the Titans.” Much of its rhetoric recalled an earlier era and the founding mythology of the city: geology and location. It characterized Pittsburgh, as had other articles before it, as having an especially close relationship with nature: “Of all great cities, probably none is so dependent upon natural resources, especially upon mineral resources, as Pittsburgh....” Pittsburgh’s coal seam was “the world’s most valuable single mineral fuel deposit” on which the city “literally and figuratively” rested. It described the city as “set in a circlet of riches.” National Geographic remarked on Pittsburgh’s ideal location for the “collection and assembly of vast quantities of bulky raw materials” and on its “spectacular setting” and “great natural beauty as well as colossal utility.” It called Pittsburgh “direct, natural, vibrant and vital,” possessed of “fundamental strength” and “dynamic drive,” a city of “producers” in contrast to mere “market places.” It celebrated the city’s status as “capital of coal and steel.”

The article’s climax was a description of recent civic improvements, noting that Pittsburgh had long been too busy with production to attend to its environmental
problems. It blamed Pittsburgh’s inherent conservatism for the willingness to put up with smoke and the belief that it indicated prosperity. National Geographic claimed that “Smoke elimination has become a dramatic symbol of the whole powerful impetus toward civic improvement.” It credited the Mellons, whose wealth made up “one of the largest working fortunes in the world,” with initiation of the process. Yet it also noted a possible motivation. The Mellon fortune gave the dynasty the “largest single family stake in many of the great industrial corporations of Pittsburgh.”

Yet the article emphasized the city’s and the Mellons’ neotechnic investments. “It is a mistake to think of Pittsburgh only in terms of coal and steel” since it housed some of the largest manufacturers of many other important products, including aluminum and chemicals as well as electrical equipment. Although the ore from which it was made was not locally mined, Pittsburgh held the home office of Alcoa, the world’s first and largest aluminum company, which had been founded under Mellon sponsorship in Pittsburgh. The article emphasized the city’s manufacture of huge electrical equipment and its leadership in radio technology with KDKA. It called the city “a center for research” with Mellon Institute, Gulf Oil and Westinghouse Laboratories. Pittsburgh was “the headquarters of coal research in America” even though “for many years the cheapness and abundance of coal [had] discouraged intensive chemical research.” The article referred to the “pilot plants” for making gasoline from coal and mentioned joint research by coal and oil companies on this problem. Gulf’s laboratories, in particular, were also involved in research into coal gasification. National Geographic also spoke of Mellon Institute’s role in founding one of the nation’s “largest chemical manufacturers” and its research into synthetic chemical products and uses for “steel and coal mine wastes.”
Despite its eventual failure, the Mellons, as late as 1949, appeared to have been committed to ensuring a neotechnic future for Pittsburgh coal. Mumford, Mellon Institute, Pittsburgh (1942) and the smoke control movement of the 1940s and 1950s all celebrated the production of coal-tar synthetics as a “no-cost solution” to Pittsburgh’s many problems. Like alchemy, coal-tar chemistry claimed to be able to produce gold from lead. Yet, in the story of smoke control, as we will see, the neotechnic alchemy of aluminum and coal by-products would fail to provide a no-cost solution – just as the alchemical search for the Philosopher’s Stone had failed.

5C.8 “Live where you work, work where you live”

The Mellons’ decision to put so much energy into Pittsburgh, while they clearly had many financial outlets not indissolubly linked to the city, violates expectations shaped by third millennium globalization. Some clues are available from a Business Week report on the Mellon business expansion of 1948, “The Mellon Family Bank: How Big Will It Get.” Mellon National Bank and Trust was, in 1948, Pennsylvania’s largest bank. It was headquartered in Pittsburgh and had purchased sixteen area banks in the previous year. Limits to its expansion were imposed by Pennsylvania law which allowed a bank to have branches “only in its home and adjoining counties.” Mellon Bank had started in Pittsburgh itself and prepared for extensive branch operations under the Mellbank Corporation in the 1920s with interests in 18 banks at its peak. The Mellon controlled banks were “pillars of strength in their respective communities during the dark years of the 1930s.” By 1948 Mellon National Bank and Trust had become the fifth largest bank in the United States. As compared to other Mellon enterprises, the bank offered
especially good returns, even compared to Gulf Oil, ALCOA and Koppers.\textsuperscript{307} So – Mellon Bank was a local enterprise by law, one not easily moved, and was one of the most important parts of the Mellon financial empire. These characteristics help to explain the Mellon attachment to Pittsburgh.

By late summer 1949, smoke control in Pittsburgh was an accomplished fact and an important symbol of the city’s rebirth. In August 1949, the Pittsburgh Chamber of Commerce was hosting “Welcome Weeks” to draw visitors. The weeks featured exhibits and industry sponsored steamboat races as well as an outdoor music performance.\textsuperscript{308} On September 26, 1949 Newsweek did a special report on Pittsburgh’s smoke control, “Pittsburgh Comes Out of the Smog.” It mentioned new strikes in Pittsburgh, but regarded strikes as temporary matters: “strikes may come and go” but Pittsburgh’s “remarkable rebirth” was permanent and more important. Pittsburgh, the “nineteenth century milltown,” had been remade into a “twentieth century industrial metropolis.” The article emphasized the Mellon family’s loyalty to the city:

The Carnegies, Fricks and Schwabs left Pittsburgh. Unlike them Richard Mellon remained there....He has told how his father R. B. Mellon drove him around New York when he was a boy, pointed out all the mansions of the ex-Pittsburghers, and advised: ‘Live where you work, work where you live.’\textsuperscript{309}

Smoke control was characterized as the “greatest” and “most visible” “miracle” “so far” The article claimed that “in less than two years the city of Pittsburgh alone...has cut the famous smoke pall by half.”

The result has been a revelation to the city’s dwellers. They are discovering unsuspected beauties in the hilly vistas, a crude grandeur in the city of steel, a surprising amount of leafy green. At night the city glitters with a new brightness, under a sky filled with stars and moonlight. The current younger generation will be the first to have lunar help in the discovery of romance...Pittsburgh has always had its underworldly glow, the deep orange red of the furnaces lighting up the
bowl of smoke that served for sky. Now, in some measure at least, even these are dimmed under the visible heavens and Pittsburghers have gained a new sense of proportion from the change.\textsuperscript{310}

The victory over smoke convinced Pittsburghers that “better things, somehow, can get done.” It had given the ordinary Pittsburgher faith in the whole redevelopment program and “lifted the spirits” of the entire population. The article concluded:

“Pittsburgh was coming back.”\textsuperscript{311}

Meanwhile, in American City, David Lawrence testified to the usefulness of “private research and planning agencies” in city government. The article called them “bird dogs that hunt down ideas and keep pointing at them until somebody does something about them.” He credited the bird dog ACCD for much of the success of Pittsburgh’s anti-smoke and other revitalization programs.\textsuperscript{312}

On October 3, 1949 “Pittsburgh’s Richard Mellon” was on the cover of Time. The article “Mr. Mellon’s Patch” portrayed Pittsburgh as a “city of new hope” even in the face of continuing strike threats. The article described the legendary Paul Bunyans of steel, Joe Magarac and Steve Mestrovic, and used their stories to celebrate “an industrial development” that was unequaled anywhere in the world. Time celebrated Pittsburgh’s production but lamented its history of class stratification, “filthy air,” floods and “bloody strikes.”

It portrayed 20\textsuperscript{th} century Pittsburgh as a monster:

a grimy giant sprawled across a coal seam, gobbling up ore from Mesabi and spewing out molten steel. It squatted black and ugly on the hills between the Allegheny and the Monongahela, trailing mill towns up and down its river valleys. It dug the coal and fed it into fiery furnaces, and strewed the mountainous offal of its furnaces across the landscape.
Smoke from its stacks and its chimney pots, ash from its blast furnaces hung over its head in a never-dissipated cloud. Smoke curled even from the gashes in its hillsides, where fire burned internally along the coal seams.

It was a city better seen at night. Then it had mystery, beauty and grandeur – a mammoth black patchwork, spotted with the pink blossoms of the Bessemers, hung with light stretching out between the pale river highways, the Ohio, the Allegheny and the Monongahela. In the daytime it emerged in all its sprawling ugliness.313

The article acknowledged the persistence of frontier ideology in the city:

To the genteel 18th Century into which it was born, Pittsburgh was the essence of a frontier culture, which it has never quite managed to shake. In recent years it has jeeringly been called an esthetic abortion, a municipal hovel, a mining town on a vast scale.314

*Time* described failed attempts to raise the city’s cultural level without thorough-going reform, which seemed, in terms of images at least, to mean – without smoke control. It described “Andrew Carnegie’s blackened sandstone museum, whose bilious soot-streaked walls were hung with a weird jumble of oil paintings,” and Carnegie Institute, “beside a ravine which belched forth the smoke of locomotives” (the Junction Railroad). Pittsburgh before its recent revitalization had been “a city in which was concentrated all the evils and ailments and shocks of the nation’s industrial age.”

*Time* traced the city’s history but said “through all of that growth and most of the city’s history, like a golden strand, ran the name of Mellon” – financing endeavors for Pittsburgh and beyond. Smoke control appeared as a major and obvious early accomplishment of the program. The article recounted the story of R.K. Mellon’s return, on a black smoggy night, from his World War II job in Washington and his wife’s remarks: “I had almost forgotten how bad it is... Now I understand why people leave it and why a lot of people will never come back to it.” R.B. apparently replied: “We must
come back here.” To which his wife responded: “Well, you have a lot of ideas about it. Will they every get done?” and R.B. answered “They must get done.” The list of things to do was of long standing, with plans dating back at least to 1910, “[b]ut in Pittsburgh a ‘must’ from a Mellon list gets done, especially when the Mellon himself gets busy and sees that it is done.” Fogs still came but they were no longer smogs. Flood control and traffic saw progress. In housing progress was slow; adequate housing was to be expected only by 1970. Skyscraper construction attested to business leaders’ belief in the city’s future. “Pittsburgh was asserting its iron-jawed belief in itself and its iron-jawed confidence that it could set things right.” The article called the ACCD an “experiment in a new and wiser capitalism – working to repair the damage done by the purposeful haste and thoughtlessness of the old empire builders. If capitalism couldn’t do it, the men of Pittsburgh were convinced, no one else could.”

5C.9 Assessing the Success of the Renaissance

Pittsburgh’s post-war smoke control movement put itself forward as a no-cost solution to Pittsburgh’s long-standing problems. It promoted a local processed-coal industry as the answer to smoke control’s expected exacerbation of the coal industry’s already difficult economic position. In the end the coal industry suffered dramatically as domestic users availed themselves of natural gas from the Southwest, newly available through pipelines that had been built to transport oil to Pittsburgh for war production. The local papers blamed striking miners’ unions rather than smoke control for coal’s difficulties. They saw the shift from what Meller in the 1920s had called Pittsburgh’s “natural fuel” to “laborless fuels” as simply rational.
The happy coincidence pictured in the movie *Pittsburgh* and in the predictions of the promoters of smoke control in Pittsburgh did not come to pass. Miners lost jobs and, despite the city’s celebrated environmental cleanup, Pittsburgh industry was not reborn into the neotechnic. Lack of diversification and old technology continued to plague the city until the final decline of steel in the 1980s. Yet neotechnic ideology was operative among Pittsburgh’s business leaders who continued to turn their investments away from iron, steel, local labor and local nature and into global investments. Nonetheless, the effort behind the Pittsburgh Renaissance speaks to an uncharacteristically non-neotechnic attachment of the Mellons to a particular place. The Mellon family and the others who orchestrated the Pittsburgh Renaissance put the effort they did into this particular city because of the power of local history. Generations of Presbyterian steel-masters in Pittsburgh had been criticized for lack of public spirit and concern for their city. Here at last was an opportunity to act on this criticism without fundamentally threatening their business interests. This was true for two reasons. First, many of their most important industrial interests were primarily elsewhere – global, diversified and neotechnic. Second, the neotechnic had already transformed even the local steel industry to rely on the re-use of its own wastes. By-product collection had been the standard in mills since just before the first World War. When the new smoke ordinance was passed in 1941, industrial users were the first class of smoke producers asked to comply. Smoke abatement for industry – to the level required by the ordinance – was nearly a done deal – of a piece with expected neo-technic standards.

Public figures looking back from the period of Pittsburgh’s Renaissance claimed that the clean-up of the air had been successful. Yet they were able to do so only with
reference to various means of measurement long regarded as problematic. What had happened to the difficulties and ambiguities involved in pollution definition and measurement and in justifying pollution abatement during Herbert Meller’s long years of service? One cannot assume that what was difficult to define, measure or justify in 1938 was unproblematically definable, measurable and justifiable by 1941.

In 1947-48, newspapers reported a 39% increase in sunlight, 50% fewer hours of moderate and heavy smoke and dustfall slightly decreased in comparison to 1946-47.316 By 1953 soot-fall had dropped below its 1938 level, even though Pittsburgh’s industrial capacity had continued to increase during the war and the post-war period. Nonetheless, the total number of days on which visibility was hampered by air pollution remained high throughout the 1950s. The Weather Bureau data on which air pollution improvement claims were based were all collected by measuring visibility from downtown to landmarks at known distances. Smokiness and smoke density were determined based on the visibility grades of 3/8 mile, or 3/4 mile. Although those who have examined the data claim that the duration and heaviness of smoke decreased dramatically after the enforcement of the ordinance, the total number of smoky days was not lowered to 1915-20 levels until 1970-75. Further, improvements in visibility from downtown may tell us more about the changing distribution of industry and power generation than about the effectiveness of smoke control.

Fly ash, particularly from open hearth furnaces, remained a problem. The technology for eliminating or dramatically reducing fly ash emissions from open hearth furnaces at steel mills was inordinately expensive according to the writer of a 1960 master’s thesis evaluating the success of smoke control.317 Fly ash had in fact been
regulated to a specific standard in the 1941 ordinance, yet it appears that in 1960 it was not being adequately controlled. The thesis writer looked hopefully toward the reuse of industrial wastes as a solution to the problem, despairing of any solution motivated solely by the desire to control pollution – or that might carry net costs for local industry. In 1969, Pittsburgh historian, Roy Lubove argued:

...In 1957 the county absorbed the Pittsburgh Health Department, whose Bureau of Smoke Regulation had enforced the city ordinance. A new comprehensive regulation, administered by the County Bureau of Air Pollution Control, was passed in 1960. ....By that date the urgency and sense of crisis had passed. The smoke control legislation of the 1940's had achieved its purpose; it eliminated the blatant ash and soot pollution that required street lighting at high noon, and thus enabled the civic coalition to proceed with its reconstruction program. Subsequently, progress under county auspices has been uneven. Gaseous and micro-dust pollution is extensive, including high levels of nitrogen and sulfur dioxide. Certain sections of the city, like Squirrel Hill and especially Hazelwood, still suffer at times from a thick, malodorous smog and a quick settling layer of black dust. Generous provision for staggered enforcement in the county legislation has permitted the use of obsolete equipment in steel plants. Pockets of old-style, thick grey-black smoke still existed in the 1960s in the river valley milltowns.318

Re-examining this story in light of changes in the cultures of public health, national politics and technology in these years can yield a deeper understanding of the failures and successes of science and regulation in the culminating years of Pittsburgh’s anti-smoke movement.

While by several measures, Pittsburgh’s air pollution was significantly reduced, the improvement was not what Meller had hoped for in the 1930s.319 Meller’s obituary appeared in the New York Times on June 6, 1943. He had been an honored guest at the formal signing of Pittsburgh’s “strict” new smoke ordinance for which he was credited as having “laid the groundwork.” He had moved from Pittsburgh to sunny Florida a few years before the ordinance was passed, in order to protect his failing health.320 Without
the answers to his questions from the 1930s it is difficult to assess Renaissance claims of success. The happy coincidence of Dietrich and Wayne and of the 1941 ordinance – plenty of jobs, neotechnic industry and clean air – never came to pass in Pittsburgh, not in the 1950s and certainly not after the final decline of steel three decades later.

Notes


8. Lubove, Twentieth Century Pittsburgh, 111.

10. Roderick Nash in Wilderness and the American Mind (New Haven: Yale University Press, 1967) discusses the historical importance of the image of the abandoned city overgrown with vegetation as an object of fear. Here the image is reversed to fit post-Romantic attitudes toward wild nature.


13. Long retired from teaching and moved to the Southwest in the interests of his health in 1929. He died in 1956.

   Joel Tarr’s 1994 newspaper editorial discusses the story and says that Long’s fantasy is not far from the reality of the Pittsburgh Renaissance under the Mellon and Lawrence private-public coalition. In “How Pittsburgh Returned to the Jungle” no one suffers real losses, and Pittsburgh’s Renaissance was sold under this sort of claim since the use of smokeless coal to abate air pollution was to mean no loss to industry. Yet in the end change came only with more widespread adoption of natural gas, and miners did lose jobs. Yet, as in the story, Pittsburgh’s downtown grew as was only possible with the Renaissance. Tarr criticized recent attempts, in the 1990s, to regenerate Pittsburgh according to win-win no cost scenarios. He acknowledges that these seem attractive but warns that we must be alert to the lessons of history: no cost is only for fantasy. In particular Tarr looks at proposals for environmental industry as a centerpiece of Pittsburgh revitalization. As a historian he reminds the public that before civic change is possible one must create consensus, build institutional structure, secure investment and make the plan socially sustainable by involving all elements of population in decision making process. He concludes by saying that if these steps are taken perhaps the return to the jungle fantasy can become reality. Joel A. Tarr, “Planning a Fantasy,” Pittsburgh Post-Gazette, October 8, 1994.


21. “No Mean Cities of the Middle West.”


30. Seibel, “Pittsburgh Peeps at the Stars.”

31. The article discussed both the frustrations of reformers with persistent squalor and the city’s Oakland Civic Center with its Carnegie Institute and Library and the coming academic skyscraper to be built at the University of Pittsburgh. Like the city’s artistic involvements, the University of Pittsburgh’s plans for an academic skyscraper were a commonly discussed symbol of Pittsburgh’s new hopes. In “A Tower of Inspiration To A Busy City,” the New York Times (June, 1928) took the “Cathedral of Learning” to be “an interpretation as nearly as building materials can do it, of the aspiring soul of a practical and material-minded city.” The building would embody both change and continuity: “The steel in the new building is Pittsburgh steel, the glass is Pittsburgh glass, and the intangibles which these materials will symbolize are also Pittsburgh’s.” Chancellor Bowman said that he wanted the building to be a “symbol of what Pittsburgh has come out of and what Pittsburgh hoped for.” “It will rise above the mist of the two rivers, above the smoke of the mills, above the flaming chimneys, above the sweating multitudes that have built and that maintain Pittsburgh. It will try like the Alexander murals in the Carnegie Institute, to portray the apotheosis of steel and of a civilization built on steel.” This article too, praised both Pittsburgh’s industrial identity and the way in which new cultural efforts both transcended and built upon it. “A Tower of Inspiration To A Busy City,” New York Times, June 17, 1928.


34. Tarr, “Searching For a Sink.”


45. “Coal Is To Give Us Gasoline And A New Fuel.”


52. The last major prosecutions were of the Pennsylvania Railroad. They had been fined but were now trying to obey the law: firemen were now suspended if the railroad was cited unless violation unavoidable.


54. “Abate Smoke Here Object of Institute.”

55. “Abate Smoke Here Object of Institute.”

56. “Abate Smoke Here Object of Institute.”


63. “Smoke Nuisances of the Suburbs,” Pittsburgh Post, September 26, 1925.


66. Former MISI pathologist Dr. Samuel R. Haythorn spoke on KDKA radio in the early 1920s (1920-24) under the sponsorship of the Pittsburgh Sanitation Department. Haythorn urged the public to rise above miasmatic conceptions of disease, celebrating sanitation measures purely because they destroyed vermin breeding places, rather than because of any more direct relationship between municipal cleanliness and health. (Samuel R. Haythorn, “Radio Address,” KDKA (1920), AIS: Mellon Institute of Industrial Research.) Work at MISI focused on pneumonia itself centered on curative bacteriology rather than environmental connections. Although Dr. Ralph Mellon met with Baltimore researchers doing epidemiological studies of colds and pneumonia in 1929, most of this work was not environmentally focused. Mellon worked at examining pneumonia treatments and to develop an anti-pneumonia serum. Mellon also did research connecting ultra-violet light to pneumonia — but in this case, unlike Meller, he was concerned not with smoke’s screening effects but with artificially generated ultra-violet light as a pneumonia therapy. During the summers of 1928 and 1929 the Mellon pneumonia studies focused on the popular anti-bacterial agent “phage.” (Charles B. Schildecker, “Progress Report – Pneumonia Research,” (1929); Dr. Schildecker, “Progress Report – Mellon Research Work,” (1929); AIS: Mellon Institute of Industrial Research.) Further, a 1919 survey of public health in Pittsburgh argued that pneumonia was no worse in Pittsburgh than in other congested cities and that contagion rather than environment was the chief cause of urban pneumonia problems. Maurice Davis, A Health Survey of Pittsburgh Made in 1919-1920, (Pittsburgh: Tuberculosis League of Pittsburgh, 1919).


75. New York City authorities looked to Pittsburgh and to Mellon Institute for inspiration and advice. Several articles referred to Pittsburgh and Mellon Institute air pollution expertise. Early in the 1920s the city had commissioned tests at Mellon Institute on air quality in vehicular tunnels and a 1926 smoke nuisance prosecution featured a witness from a Pittsburgh laboratory testifying for the defense about the “smokeless” quality of a particular coal specimen. “Study Tube Ventilation,” *New York Times*, April 3, 1921; “Tests Show Safety of Vehicle Tunnel,” *New York Times*, October 30, 1921; “Smoke Nuisance Case Goes To Jury Today,” *New York Times*, July 22, 1926. The *New York Times* also reported both Mellon and Mellon-linked national research on air pollution. In 1926 former MISI researcher William Charles White, who now worked for the United States Public Health Service, was initiating a study in Pittsburgh on smoke and pneumonia. The title of the article, and especially its subtitle shows why the work would have been interesting to New Yorkers: “Links Smoke And Pneumonia: Federal Pathologist Warns Against Soft Coal Menace.” *New York Times*, December 8, 1926. In addition, the *Times* also covered Mellon efforts against Pittsburgh smoke. In 1924, for example, it reported on a Mellon survey of combustion technology which was to set standards for smoke abatement equipment. “Fights Smoke Evil and Coal Bills Too,” *New York Times*, June 7, 1924. While the *Times* praised Pittsburgh’s progress in other articles, it did not fail to report ambiguous conclusions drawn from Mellon research. Such ambiguous conclusions were exemplified most clearly in the interpretation of Mellon soot-fall studies. In November 1924, the *New York Times* reported Mellon sootfall results: “City Air Laden with Dirt Despite Anti-Smoke Laws.” This article summarized a report by Herbert Meller in which he both praised and criticized the municipal smoke ordinances of the previous decade as resulting in “a decided decrease in the amount of dense smoke in city air, without a corresponding abatement of the evils of dirt and acids.” “City Air Laden with Dirt Despite Anti-Smoke Laws,” *New York Times*, November 23, 1924.


619


By late 1929, however, New York, like Pittsburgh, claimed dramatic success in smoke abatement. On October 12, 1929 (17 days before the Crash) the New York Times reported that New York’s smoke had been reduced by 70% in Manhattan and 50% on the rivers according to the latest New York City health department report. The health department claimed credit for the reduction. While the article expressed skepticism about how such a result could be determined for New York, it reiterated claims of smoke control success in Pittsburgh. New York’s smoke reduction did not, however, diminish opinion there of the progress made in Pittsburgh. “New York’s Smoke,” New York Times, October 12, 1929.


93. H. B. Meller, “Progress Report for February 1, 1930, Smoke Abatement Industrial Fellowship No. 3 (Special),” AIS, Mellon Institute of Industrial Research, Series 1, Box 2, F 24.

94. H. B. Meller, “Progress Report for the week ended February 1, 1930, Smoke Abatement Industrial Fellowship No. 3,” AIS, Mellon Institute of Industrial Research, Series 1, Box 2, F 24; James Edward Ives et al., Atmospheric Pollution of American Cities for the Years 1931 to 1933, With Special Reference to the Solid Constituents of the Pollution, (Washington: G.P.O., 1936): 1-75. In addition, contrary claims about pollution sources were made in the nationwide survey and by Pittsburgh authorities: the survey asserted that residences produced less smoke in proportion to coal consumption than did industry.


98. Ralston, “Pittsburgh.”

99. Ralston, “Pittsburgh.”

100. Ralston, “Pittsburgh.”


102. In May 1931 the magazine Travel published “Pittsburgh, Symbol of Power” in which the city is featured as a sight to be seen. In July 1931, Living Age published “Pittsburgh in Depression.” The article summarized the report of H. N. Brailsford associated with the “left wing of the British Labor Party” on his visit to Pittsburgh as part of travels throughout the United States. He began by remarking, as many British visitors had, on the accessibility of Pittsburgh’s coal (for which “there is no need to sink a shaft...only drive a gallery into the hillside”), as well as the abundance of local petroleum and natural gas. These, for Brailsford, showed the degree to which Pittsburgh has contributed to America’s wealth. He emphasized the city as an industrial spectacle: “By night the heavens declare the glory of man” and the “prodigal energy and daring” with which humans had “improved what nature gave.” He mused on the causes of the depression: “If one marvels in Pittsburgh at the wealth of nature and the ingenuity of man, one also asks how all that they produce in partnership can possibly be consumed.” He went on to describe the poverty of the city in Depression and to contrast the sabbatarian strictness of Pittsburgh’s Scotch-Irish steelmasters with their insistence on Sunday work for their employees. H. N. Brailsford, “Pittsburgh in Depression,” Living Age 340 (July 1931): 511-12. Finally, in November 1931 Business Week published “Pittsburgh Bows To The Storm But Sees Clear To Sky Ahead.”


104. This conception of domination by this ethnic and religious elite is much like that described by James Parton in the Atlantic in 1868.

105. Duffus, “Is Pittsburgh Civilized?”

106. The 1930 article complained of the lack of artistic support for culture. Parton had praised Pittsburgh ironmasters as above such frivolity. Earlier Mellon researchers, in the MISI studies, had blamed this same phenomenon on smoke. Other articles from the 1920s and into the 1930s celebrated it the new found
interest of Pittsburgh elites in art patronage. Duffus, “Is Pittsburgh Civilized?”

107. Duffus, “Is Pittsburgh Civilized?”


110. O’Connor, Mellon’s Millions.


117. Barbara Melosh makes a similar point about the representation of men and women in New Deal public art in connection the dignity of manhood and work. Melosh, Engendering Culture, 83-109.

118. The article emphasized that Pittsburgh’s eighty years of steel-making was a short time in the life of a city and cast about for other identities. It discussed the frontier past and was illustrated with photos of mills, but also of Pittsburgh’s Golden Triangle, the Cathedral of Learning and the new Mellon Institute building, then under construction. The article was essentially geographic description of the city. It celebrated the city’s transportation advantages and “man’s ...intelligent use of his environment” in steel-making. It did not raise questions about Pittsburgh’s future economic survival, complain about environmental degradation or poverty or see its new buildings as a departure from its industrial ideology. Z. A. Thralls, “Pittsburgh, the City of Steel” Home Geographic Monthly 1:25-30, March 1932.

119. Thralls, “Pittsburgh, the City of Steel.”


121. American Mercury in March 1933 expressed popular ambivalence about the city’s character and future. “Pittsburgh: the City That Might Have Been” began: “Framed by three epic rivers and perched upon a score of dramatic hills, the city that might have been as beautiful as Edinburgh or Budapest is as dubious as – Pittsburgh.” While the author attributed to Pittsburgh a “panorama that would be starred in the Baedeker of any European town” he compared it to the nearly deserted Colorado silver boomtown, Leadville, “a place...where many people have made much money and moved away. “ Like other writers of this period he looked expectantly for redemption: “Some day this city will be as beautiful as Stuttgart or even Budapest, which it resembles in topography...” He complained about some of the newer civic additions: though he approved the design of the new Mellon Institute, he did not like the Cathedral of Learning and called the “new Presbyterian church being built in East Liberty with aluminum dollars” a.k.a. “the Mellon Fire-Escape” a “block-house” compared to the cathedral in St. Louis. G. Seibel, “Pittsburgh:
the City That Might Have Been.”


123. Haniel Long, “Pittsburgh Memoranda.”


131. Byington, “Pittsburgh Studies Itself.”

132. A series of sketches of Pittsburgh mills entitled “Steel,” by Federal Art Project employee and former Guggenheim fellow Elizabeth Olds, were captioned with a quotation from John Fitch’s volume of the Pittsburgh Survey: “there is a glamor about the making of steel.” Elizabeth Olds, “Steel” (drawings), Survey Graphic 27 (February 1938): 72-73. Olds’ sketches were accompanied by another sequence of Pittsburgh drawings by Mabel K. Day entitled “In Perspective – Picturesque.” Mabel K. Day, “In Perspective – Picturesque” (drawings), Survey Graphic 27 (February 1938): 78-79.

133. Byington, “Pittsburgh Studies Itself.”


142. “Pittsburgh Begins to Rebuild,” 49.
143. In June 1938, the New York Times, reporting on a Pennsylvania tourism campaign, noted: “Passing through Pittsburgh one may catch a glimpse of some of the most spectacular industrial pictures in the United States. A new word, ‘smog’ is one of Pittsburgh’s claims to fame.” The article asserted that “smog” “was definitely one of the things to be seen west of the Alleghenies.” “Keystoners ‘Sell’ State,” New York Times, June 5, 1938.


145. “What Pittsburgh Suggests.”


147. Glenn E. McLaughlin and Ralph J. Watkins, “The Problem of Industrial Growth in a Mature Economy” The American Economic Review Volume 29, Issue 1, Supplement, Papers and Proceedings of the Fifty-first Annual Meeting of the American Economic Association (March 1939): 1-14 (7). National industrial growth “continued until recent years to feel the stimulation of rapid industrialization of newer centers in the Midwest, the South, in the Southwest, and on the Pacific Coast.” Yet areas of rapid industrialization were now growing smaller in proportion to the total national economy. Pittsburgh’s composite industrial growth was about .5% while that of the nation as a whole was almost 1.5%. McLaughlin and Watkins, “The Problem of Industrial Growth in a Mature Economy.”


152. The article summarized the employment picture in Pittsburgh just before and during the Depression. In most months of 1929 5-10% of Pittsburgh workers were without jobs, and those with jobs had suffered monthly hours curtailments of 4-16%. This total unemployment and underemployment in 1929 converted to equivalent total unemployment would be 14%. The authors estimated that average plant overcapacity in the year was at least that high.

The situation during the Depression was even worse with “drastic” declines in employment and production between 1929 and 1932. Man-hours in manufacturing industries fell 59% and total industrial production fell 62%. August 1932 was the low point for total unemployment in the Pittsburgh district; at that time 40% of those usually employed were without jobs.

It continued: “Although the evidence is not entirely convincing, the fifty-five-year record of industrial production in the Pittsburgh district seems to indicate that cyclical swings have become more severe and that under-utilization has tended to last longer as the economy has become more mature.”

153. The Cradle Will Rock (performed 1937).


159. Mumford took on Werner Sombart’s criticism of the neotechnic as just a substitution of the artificial for the natural by arguing that sometimes technological advance made natural products more important. Mumford, Technics and Civilization, 233-4.


163. The neotechnic vision contrasts with views expressed by Graham, Long, Duffus and others that saw Pittsburgh’s recovery as dependent on traditional local relations to labor and nature. Neither did the University of Pittsburgh economists who saw fundamental reform of the enterprise system as the only answer to Pittsburgh’s industrial maturity, share this neotechnic vision.


167. Mellon Institute, A Description of the Symbolism in Mellon Institute.

168. Mellon Institute of Industrial Research, A Description of the Symbolism in Mellon Institute.


173. Throughout the period worries about the decline of coal were connected to worries about the decline of cities. H. B. Meller, “Air Hygiene,” AIS, Mellon Institute of Industrial Research. As early as 1927 smoke regulators had pointed to air pollution as a cause of flight to the suburbs. “The Smokiest Cities,” Literary Digest, April 24, 1927. In smoke control efforts to come in the early 1940s, would-be regulators would call the attention of representatives from the coal industry to the problem of coal’s loss of domestic customers to natural gas in new subdivisions. Pro-elimination forces urged the coal industry to support smoke control in order to recapture some of this lost market. “Report of the Mayor’s Commission for the Elimination of Smoke, 1941,” (1941); “Testimony From the 1941 Smoke Council Hearings Pertaining to Smoke Control and Its Effects on Labor (esp. Coal) – Proceedings of the Fourth meeting of the Pittsburgh Smoke Council – Feb. 28, 1941,” (1941); Joel Tarr, personal files.


178. In the Readers’ Guide to Periodical Literature for 1915 to 1918, under “Pittsburgh University” ten of eleven articles discussed research at Mellon Institute. All of these were in science and popular science publications. Overall, of the thirty-four articles under all headings associated with Pittsburgh thirteen discussed Mellon Institute. This distribution of articles, while it surely reflects the Institute’s own determination to publicize its efforts, shows how its endeavors were positioned to represent Pittsburgh in national consciousness in these years. In the 1920s Readers’ Guide Mellon Institute continued to appear as a separate sub-heading and in some years to occupy a significant proportion of the entries. Mellon Institute retained its own Readers’ Guide subheading through 1945. Readers’ Guide to Periodical Literature (Minneapolis, Minn: H.W. Wilson, 1901- ).

179. “The Significance of Mellon Institute,”104, 107; Mellon Institute, A Trip Through the New Building of Mellon Institute,1, 4-5.


182. H. B. Meller, “City Air Pollution in a Period of Industrial Depression,” 1934, AIS, Mellon Institute of Industrial Research, Series 2, Box3, 1934. Meller’s October 1936 article the “Social Significance of Air Pollution” was filled with New Deal themes such as the community obligation toward the unemployed. H. B. Meller, “Social Significance of Air Pollution,” Industrial and Engineering Chemistry 14, no. 20 (1936): 411-12.


185. Since Meller’s new work focused on air hygiene, he was concerned not just with heavy dust that was most likely to fall near the source as soot-fall but also with the smaller suspended particles most dangerous to health and capable of wafting for long distances through the air. As a result of the latter concern, Meller reasserted his demand for control of sources of air pollution outside of the city limits. In 1933 he recast this concern in terms of the need for an “air hygiene district,” providing for comprehensive regulation of air pollution in Pittsburgh and in the surrounding municipalities that contributed to its air pollution problem. H. B. Meller, “Press Release for use Monday, August 14, 1933,” AIS Society, Mellon Institute of Industrial Research, Series 1, Box 2, F 24.


187. Meller, “What Smoke Does and What To Do About It.” As early as 1924, after the ambiguous results of the 1923-24 soot-fall study had come in, Meller had considered the idea that some particulates contributing to the increase in total solids had come from non-stack sources. H. B. Meller, “The Air Pollution Problem of Pittsburgh,” (1924). At a 1928 air pollution symposium Meller attended, a significant part of the discussion focused on the likelihood that invisible components of air pollution could be of non-combustion origin. Meller, “Damage Due To Smoke.”

188. Meller, “Air Hygiene.”


191. In 1929 Mellon Institute was involved in The Pittsburgh Pneumonia Prevention Survey Committee. The Committee had three units under its executive council: units for statistics and evaluation and one to conduct the Medical and Engineering Field Survey. The latter branch was divided into its two parts. Under the medical division fell Clinical studies, Hospitals, Medical Schools, Cold Control Groups, Industrial Plants and the Department of Public Health. Of these, the hospitals, medical schools and control cold groups would be under the oversight of the Singer Memorial Laboratory. Industrial Plants and the Department of Public Health would conduct their own investigations. Singer Laboratories would also do work with Mellon Institute and the Heating and Ventilation Departments of Carnegie Tech as well as the US Bureau of Mines in carrying out the Engineering Survey. The US Weather Bureau, Department of Public Health and Bureau of Smoke Regulation would do their own Engineering Survey work. The project had a total budget of $70,000. “The Pittsburgh Pneumonia Prevention Survey Committee,” (1929), AIS: Mellon Institute of Industrial Research.

192. H. B. Meller, “Progress Report for April 5, 1930, Smoke Abatement Industrial Fellowship No. 3 (Special),” AIS, Mellon Institute of Industrial Research, Series 1, Box 2, F 24.


195. At the same time Ralph Mellon’s purely curative pneumonia research continued at the institute.

196. “Questionnaire on Pneumonia,” AIS, Mellon Institute of Industrial Research, Series 2, Box 2, F 1, 1933.


198. H. B. Meller, “Need of Medical Cooperation in the Problem of Smoke Abatement,” AIS, Mellon Institute of Industrial Research, Series 1, Box 2, FF 26, 1933.


206. The idea that freedom from impurity was not even natural was put forward in a 1931 article in one of the Pittsburgh newspapers that claimed that air pollution in Pittsburgh was worsening (based only on the 1923-24 soot-fall study) but that argued against “extremists” that some level of particulate contamination was natural in air and that without such “contamination” there could be no rain. The article went on to say that it did not mean to say that current smoke levels were acceptable, merely that it was not necessary or desirable to altogether eliminate dust in the air. “Smoke Laws Fail to Clear Air Is Report – Pollution Increased Here After Passage of Act, Claim - Sootfall Is Less – Boston Engineer Says Dust in Ether Is Harmless and Necessary to Life,” The Pittsburgh Post-Gazette, January 30, 1931. The 1938 article in Pittsburgh’s Health contrasted “hygienically pure air” with “absolutely pure air” while, nonetheless urging revision of ordinances beyond control of visible smoke alone. H. B. Meller, “Air Pollution...Municipal and Industrial,” Pittsburgh’s Health 6, no. 4 (1938): 2-4.

207. H. B. Meller, “Progress Report for the week ended February 11, 1930, Smoke Abatement Industrial Fellowship No. 3,” AIS, Mellon Institute of Industrial Research, Series 1, Box 2, F 24, 1930.


211. Meller, “Air Hygiene.”


215. Meller, “Air Pollution...Municipal and Industrial.”

216. Similar arguments could, and indeed were, made about the inability of biological evolution to adapt rapidly enough to increasing pollution. M. A. Yavorsky, Meller’s successor at Mellon Institute, employed what would become Rachel Carson’s argument twenty years later in relation to air pollution and health. (M. A. Yavorsky, “Final Report,” 1936, AIS, Mellon Institute of Industrial Research, Series 1, Box 2, FF 28.) In a 1938 article in Pittsburgh’s Health the researcher contrasted “hygienically pure air” with “absolutely pure air” and argued that humans could live with the level of particulate contamination with which they had evolved but not with the dramatically increased level brought about by modern industry. Meller, “Air Pollution...Municipal and Industrial.” The goal of determining a standard of hygienically pure air, under this view, contrasted sharply with the view that had emerged from work in occupational health and safety, and which had been adopted by Meller. According to this way of thinking, the standard for hygienically pure air should represent a return to a “natural” level of particulate contamination, that is, one of the sort that prevailed through most of human evolution. Yavorsky also pointed to the lag between technological and biological evolution when discussing the dangers of low concentration air pollutants to humans, in spite of the fact that they failed to produce the sorts of acute and invariable effects seen in the occupational context. (M. A. Yavorsky, “Final Report,” 1936, AIS, Mellon Institute of Industrial Research, Series 1, Box 2, FF 28.)
217. Hosack, *A Survey of the Department of Public Health*. It emphasized that violent death and cancer were bigger causes of death than all bacterial diseases except pneumonia, both highlighting the importance of pneumonia and the need to expand public health beyond attention to bacterial disease alone.

218. “Smog and You,” (Bureau of Smoke Regulation, City of Pittsburgh Department of Public Health, 1938), AIS: Mellon Institute of Industrial Research.


222. Haythorn and Meller, “Necroscopy Evidences on the Relation of Smoky Atmosphere to Pneumonia.”


227. Alexander, “Smoke and Health.”


230. Meller, “Practical Procedures and Limitations in Present-Day Smoke Abatement.”


238. “Pittsburgh At Capacity.”

239. “Hornes’s department store hasn’t seen even a ghost of a blue-jeaned workman fingering $15 silk shirts.” Greater sales of mink coats and jewelry at Hornes were attributed to “cautious buying on the part of the already prosperous, who figure their money is safer in goods than in banks.” Movie going, appliance sales and sales of Heinz’s “most luxurious product” chili sauce were up. “Pittsburgh At Capacity.”

240. “Pittsburgh At Capacity.”


244. “What’s Itching Labor?”

245. “What’s Itching Labor?”

246. “What’s Itching Labor?”

247. Pittsburgh (Universal Pictures Co.: 1942) written by Kenneth Gamet and Tom Reed, based on an original story by George Owen and Tom Reed.

248. Pete Seeger and Woody Guthrie’s song “Smoky Old Town” (1942) connected environmental degradation and exploitation of workers. They asked “What did Jones and Laughlin steal?” The answer: “Pittsburgh” and ended the song in triumph: “From the Allegheny to the Ohio, they’re joining up in the CIO” a reference both to Pittsburgh’s prodigious natural setting at the forks of the Ohio and to its burgeoning unionism. Pete Seeger, Woody Guthrie, “Smoky Old Town,” (1942).

249. Pittsburgh, 1942.

250. Buente, “Pittsburgh’s Post-War Program.”


253. “Mellons Go To Work Again.”

254. “Mellons Go To Work Again.”


256. “Pittsburgh’s New Powers.”

257. “Pittsburgh’s New Powers.”

258. “Mellons Go To Work Again.”


260. Perry, “Cities of America.”

261. Perry, “Cities of America.”

262. Perry, “Cities of America.”

263. Perry, “Cities of America.”

264. Perry, “Cities of America.”

265. Perry, “Cities of America.”

266. “Ghost Town.”

267. “Ghost Town.”


270. “Pittsburgh’s New Powers.”


274. An ad run in *Newsweek* in September 1949 touted “modern mine machinery” which made it possible that “today miners rarely touch pick and shovel...[i]nstead their hands operate the controls of machines.” Advertisement: “These Coal Miners Never Touch Coal!” *Newsweek* 34 (September 19, 1949).


277. “Cities Take Inventory.”

278. “Cities Take Inventory.”

279. “Pittsburgh’s New Powers.”


287. Local coal operators called oil, gas and anthracite “high cost” and the former two “luxury fuels” in debates about whether substitute fuels should be adopted as one means of smoke control. They did so within a few years of Pittsburgh’s enthusiastic embrace of these luxuries and its rejection of trusted local alternatives.


289. Newspaper Articles Pertaining to Smoke Control, 1941-1950, notes by Joel Tarr.


291. Newspaper Articles Pertaining to Smoke Control, 1941-1950, notes by Joel Tarr.

292. Newspaper Articles Pertaining to Smoke Control, 1941-1950, notes by Joel Tarr.

294. “Clearing Pittsburgh’s Air.” Newsweek noted “Oddly enough, the city’s steel industry bore little of the blame. But even it had installed smokeless equipment.”


298. “City With a New Look,” American City 63 (October 1948): 5.

299. “City With a New Look.”

300. “Towards a Cleaner and Brighter Pittsburgh,” American City 63 (October 1948): 85.


302. “Pittsburgh Remodels Itself.”


304. Atwood, “Pittsburgh: Workshop of the Titans.”

305. Atwood, “Pittsburgh: Workshop of the Titans.”


309. This story is also recounted in Atwood, “Pittsburgh: Workshop of the Titans.”

310. The Pennsylvania Railroad had opposed the enabling legislation for the ordinance, but had later capitulated to pressure from Pittsburgh industrial leaders who were R.K. Mellon’s allies. The article measured Pittsburgh’s progress against smoke using the Weather Bureau’s statistics on hours of light, heavy and moderate smoke. Issacs, “Pittsburgh Comes Out of the Smog.”

311. Issacs, “Pittsburgh Comes Out of the Smog.”

312. “Pittsburgh’s Mayor Acclaims Research and Citizen Aid,” American City 64 (October 1949): 5.

314. “Mr. Mellon’s Patch.”

315. “Mr. Mellon’s Patch.”

316. Newspaper Articles Pertaining to Smoke Control, 1941-1950, notes by Joel Tarr.


CONCLUSION

Pittsburgh’s steel industry shut down in the early 1980s, taking 120,000 manufacturing jobs from the region. Displaced workers moved to the Sunbelt, struggled along until they could begin to draw Social Security, or took one (or two or three) of the 115,000 (often low-paying) service jobs created in the city over the next decade.¹ Some instead committed suicide.²

Now, hill sides above the mill sites, once completely barren of vegetation because of air pollution, have grown lush and green with new foliage. Pittsburgh has more trees per capita than any city in the United States. By 1991, at the former United States Steel Duquesne Works: “Saplings rose from inside the ruins of blast furnaces. Moss covered the catwalks. Fish swam in the sump at the water-filtration plant. And deer were said to wander at night through the hangar-like building where giant ladles had poured molten metal....”³ Perhaps Pittsburgh, or at least its former heavy industrial sites, had “returned to the jungle.”

In the heavily wooded Appalachian foothills of the Laurel Highlands, south and east of Pittsburgh, lies the town of Allison, Pa. – a former company town in the region that had supplied Pittsburgh’s mills with the coke needed for iron smelting. Allison itself had been home to seven hundred beehive coke ovens, but had been seriously depopulated with the final decline of beehive coke-making after 1950.⁴ Now, remains of tipples, mine
shafts and coke ovens are hidden in the youngest parts of the forest. In 1997 former residents of Allison held a reunion to which hundreds returned. A central feature of the reunion was the re-lighting of three coke-ovens in an attempt to recreate the spectacle associated with air pollution of the most intensive sort.5 (William Metcalf had lamented the environmental effects of Laurel Highlands coke-making at the Engineers’ Society meeting in 1892.) Pollution, for former Allison residents, was an emblem of a way of life that has been lost.


Why should we care about Homestead, or for that matter any town or city in decline? Where exactly is the ‘tragedy’ other than in the book’s subtitle? Americans are always leaving some place behind: departures are in our ancestral genes. Shouldn’t the objects of our concern more properly be the people who once inhabited such places, and the lives they are able to lead elsewhere?

Serrin responds aggressively. He imagines someone approaching Reich and suggesting that Harvard University, where Reich had long taught, be torn down – since its functions could be more efficiently combined with Stanford, the University of Chicago, etc. Serrin then imagines Reich’s appeal for the preservation of Harvard’s particular and valuable traditions and skills. Serrin wants to defend places like Homestead by the “same logic.”6
Today a retail and entertainment complex, complete with a Target store, restaurants, and a cineplex, stands on the site of the historic Homestead Steel Works. In 1892, members of the Amalgamated Association of Iron and Steel Workers faced down armed Pinkerton detectives there – and set on fire the barges which had brought the Pinkertons to Homestead. In spite of the preservation of a row of tall smokestacks, the shopping plaza seems a desanctification, a mark of alienation – this time from history.

William Cronon takes alienation as a central theme in *Nature’s Metropolis*. For him it is primarily an alienation from nature, though history plays a part as well. In his chapter on meat, he writes of the instrumentalization of the human relationship with animal life, of the alienation from natural or authentic links between killing and eating, between decay and the seasons. He writes of the logic of capitalism that made Chicago the home to slaughterhouses that served the nation – and were central to the city’s identity. Cronon takes it as fitting that the same instrumentalist logic that used slaughterhouse concentration at Chicago to efficiently commodify animal death led eventually to the city’s abandonment as slaughterhouse capital in favor of cities closer to western sources of beef on the hoof.  

I see echoes of the pattern Cronon describes for Chicago in Pittsburgh. Pittsburgh begins as a frontier place, and throughout its history backward-looking frontier primitiveness stood in tension with forward-looking frontier innovation. Yet, almost as soon as Pittsburgh ceased to be new, it stood in danger of senescence. The same logic that justified Pittsburgh’s existence on the basis of river location and abundant coal – advertised to the world by its famous coal smoke – justified the building of new steel plants in Gary and Birmingham, closer to new sources of iron ore, energy and new
western markets. The same frontier logic that justified Pittsburghers’ historic tolerance for smoke justified the temporary conversion of US Steel into USX (US “anything but steel” as it was known in Pittsburgh) in the early 1980s. If capitalism and technology bring alienation from nature, is it then simply fitting that, in time, further capitalist development will bring alienation from particular technologies, and the urban industrial ways of life built around them? Are we to be concerned, as Reich suggests, only with the well-being of individuals and not with the places and communities they come from?

As historians, we cannot deny that some kind of cultural, technological, economic, social changes over time are to be expected. Is it the logic of capitalism alone that determines what is to be carried forward and what is to be left behind? Of course, politics and culture also play more or less important roles. How do we decide politically, what to keep and what to let die about a place whose identity, as I have tried to show, was both shaped and expressed by a pollution phenomenon?

The Mellons and David Lawrence thought they knew.

In 1950 the Mellon Charitable and Educational Trust invited Lewis Mumford to come to Pittsburgh and evaluate the next phase of Renaissance plans. These involved demolishing large sections of the Lower Hill, part of Pittsburgh’s worst slum, adjoining downtown (a place with some of the highest sootfall readings and pneumonia rates in the city). My mother’s family, in 1950, still lived there, adjacent to the area that was eventually demolished -- a few blocks from Cliff Street, from which James Parton had looked down into hell. Included in the Renaissance plan was the construction of a large civic auditorium, a domed structure with a retractable aluminum roof. Mumford was appalled by plans to move the Summer Light Opera he had enjoyed in Schenley Park
during his Pittsburgh summer (1917) to the new structure. He criticized proposed high-
risers, also part of the plan, that were designed without consideration of their hilly setting.8

The new auditorium, the Civic Arena, was built in 1961. My family by then had
moved to the North Hills. Mumford wrote later that the Civic Arena turned out to be even
worse than he had anticipated: the roof could not be opened and closed at all without
hiring an expensive crew of workers to stand-by just in case of rain. When the roof
remained closed, it concentrated the summer’s heat. Pattering rain could make it
impossible to hear music. Mumford relates: “If some of my sharpest pages in ‘The
Pentagon of Power’ have to deal with the mischiefs of pecuniary pressures and
superfluous technological trickery, they had the support of experiences like this.”9

Some of my happiest childhood memories involve the Civic Arena. It was the
site of the Pittsburgh Folk Festival – held every May, often in the week of my birthday.
The folk festival gathered representatives of nearly one hundred ethnic groups, most of
whom had come to the city in large numbers to work in the mills. Falafel (in 1972!),
Baklava, Perogis, Philippine Chicken – Swedish Straw Christmas Stars, embroidery
everywhere – and every night there were folk dance performances. At the end came the
moment I waited for – the retractable roof opened and under the (often cloudy) night sky,
we sang together “This Land Is Your Land” – the crowd all facing one another and
surrounding the costumed dancers in the huge round auditorium.

I grew up loving, also, skies pink from steel mill emissions, and the contrast of
dark industrial structures and green hills. Most of the mills have been dismantled now,
and only the green is left. In C. S. Lewis’s Narnia stories, at the end of the world, all
elements of places and things that were good before the apocalypse persist in paradise.10
The things existing in this Platonic heaven are more truly themselves than they ever were as things of the world. If we are not to abandon or wantonly denature places as part of Reich’s frontier process, how can we, in this world, come to know and preserve the good essence of a place? In the 1980s, as in the 1930s, Pittsburghers struggled to understand the elements of the identity of their city and argued that these would or should help the city and its culture to persist. Like them, like Mumford, like the Mellons, and like Serrin -- we must ask ourselves the same questions. Green vines covering abandoned machinery do not guarantee non-alienated relations between people and the places where they live.

An examination of the meanings of pollution in Pittsburgh’s history, such as I have attempted in this dissertation, is part of this task. Richard White urges, in Organic Machine: the Remaking of the Columbia River that we should make choices about the future of the Columbia having learned from history to see the river as both a natural and a cultural entity.11 For White, human, technological, economic, material and cultural elements are linked by the geographies of energy flow on the river. Just as history has been concerned with all such elements, so must the choices we make about how to shape the identity of places. As Mary Douglas asserts, and as I have tried to show in this dissertation, attitudes toward environment, and particularly toward pollution, are essential to the construction and maintenance of culture. Douglas urges us to examine the meanings of pollution, as I have tried to do here, in order to “recognise each environment as a mask and support for a certain kind of society.” I have tried to show, in the case of smoke in Pittsburgh, how air pollution functioned in this way. Following White, I hope that this sort of understanding of pollution can help us to ask what kind of
society we are choosing when we make environmental decisions and to examine, with Douglas, “the value of th[e] social form which demands our scrutiny just as clearly as the purity of milk and air and water.”

Notes


3. Miller, “Pittsburgh: Stronger Than Steel.”


5. Jennifer Puskar, “Allison Reunited,” Uniontown Herald Standard, September 17, 1997. This article was given to me by the late Rita Ferrari.


BIBLIOGRAPHY

Books


*Centennial Anniversary of the Founding of Monongehela City, Pa.*  Monongahela City: C.W. Hazzard, 1895.


[Civic Club of Allegheny County].  *Fifteen Years of Civic History.*  Pittsburgh: Civic Club of Allegheny County, 1910.

[Civic Club of Allegheny County].  *Fifty Years of Civic History.*  Pittsburgh: Civic Club of Allegheny County, 1945.


Cramer, Zadok. The Navigator: Containing Directions for Navigating the Ohio and Mississippi Rivers with an ample account of these much admired waters, from the head of the former, to the mouth of the latter.... 12th ed. Pittsburgh: Cramer and Spear, 1824.


Frend, W. Is it impossible to free the atmosphere of London in a very considerable degree, from the smoke and deleterious vapour with which it is hourly impregnated? London: Charles Wood, 1819.


Gregg, O. Ormsby. Pittsburgh, her advantageous position and great resources, as a manufacturing and commercial city: embraced in a notice of sale of real estate. Pittsburgh: Johnston and Stockton, 1845.


Ives, James Edward et al. *Atmospheric Pollution of American Cities for the Years 1931 to 1933, With Special Reference to the Solid Constituents of the Pollution*. Washington: G.P.O., 1936.


Mason, Harrison D. Some Pittsburgh memories; incidents and reminiscences, with a little history intermingled, of seventy years residence in the city at the forks of La Belle Riviere. Crafton, Pa.: Cramer Printing and Publishing Co., 1924.


The Twentieth Century Club of Allegheny Country: 1896-1904 (Pittsburgh: s.n., 1904)


Thurston, George H. Pittsburgh and Allegheny in the Centennial Year. Pittsburgh: A. A. Anderson and Son, 1876.

Thurston, George H. Pittsburgh’s Progress: Industries and Resources. Pittsburgh: A. A. Anderson and Son, 1886.

Thurston, George H. Allegheny County’s Hundred Years. Pittsburgh: A. A. Anderson and Son, 1888.


### Articles


Byington, M. F. “Pittsburgh Studies Itself.” Survey Graphic 27 (February 1938): 75-9, 120-121.


“City With a New Look.” American City 63 (October 1948): 5.


Committee on Smoke Prevention, Engineers’ Society of Western Pennsylvania, “Report of the Committee on Smoke Prevention” Proceedings of the Engineers’ Society of Western Pennsylvania, 8 (1892).


Davy, E. “Experiments and observations upon the State of the Air in the Fever Hospitals of Cork, at a Time when they were crowded with Patients, labouring under Febrile Contagion.” London Medical and Physical Journal 40 (1818): 274-7.


“Dr. Meller Dead; Expert on Smoke.” New York Times, June 29, 1943.


Long, J. V. “Pittsburgh Establishes City Tourist Bureau.” American City 41 (October 1929):146-7.


“Pittsburgh Begins to Rebuild.” *American City* 54 (March 1939): 49.


“Pittsburgh’s Mayor Acclaims Research and Citizen Aid.” *American City* 64 (October 1949): 5.


“Smoke and Morals.” *Pittsburgh Bulletin* 65 (1912).


Thralls, Z.A. “Pittsburgh, the City of Steel.” Home Geographic Monthly 1, March 1932, 25-30.


“Towards a Cleaner and Brighter Pittsburgh.” American City 63 (October 1948): 85.


Extracts


Birkbeck, Morris. “An English Farmer in Pittsburgh in 1817.” In Pittsburgh as Seen by Early Travelers: Descriptions by those who visited it from 1783 to 1818, booklet


Photographs, Drawings, and Photographic Essays


Olds, Elizabeth. “Steel” (drawings). Survey Graphic 27 (February 1938.): 72-73.

Newspapers and Magazines

The American City
American Mercury
The American Museum
American Railroad Journal
Atlantic Monthly
The Bulletin Index
Business Week
Christian Century
Collier’s
The Columbian Magazine
Commonweal
Connecticut Magazine
DeBow’s Review and Industrial Resources, Statistics etc. Devoted to Commerce
DeBow’s Review of the Southern and Western States
Every Saturday
Frank Leslie’s Popular Monthly
Fortune
Greater Pittsburgh – Official Organ of the Chamber of Commerce of Pittsburgh

Harper’s Magazine
Harper’s Monthly Magazine
Harper’s New Monthly Magazine
Harper’s Weekly
Industrial World
The Iron Age
Ladies’ Home Journal
Life
Lippincott’s Magazine of Popular Literature and Science
Literary Digest
Living Age
The Nation
National Labor Tribune (NLT)
New Republic
New York Building
The New York Times
Newsweek
Niles Weekly Register
The Pennsylvania Magazine
Pittsburg Times
Pittsburgh Commercial Gazette
The Pittsburgh Chronicle
Pittsburgh Chronicle Telegraph

Pittsburgh Daily Dispatch

Pittsburg Dispatch

The Pittsburgh Gazette and Manufacturing Advertiser

Pittsburgh Gazette-Times

Pittsburgh Leader

Pittsburgh Post

Pittsburgh Post-Gazette

Pittsburg Press

Pittsburgh Press

Pittsburgh Record

Pittsburgh Sun

Pittsburgh Sun-Telegraph

Pittsburgh Telegraph

Presbyterian Quarterly and Princeton Review

Reader’s Digest

Saturday Evening Post

Scientific American

Scribner’s

Time

Travel

Uniontown Herald-Standard

The Universal Asylum and Columbian Magazine
Internet Resources


Archival Materials

Archives of Industrial Society, Hillman Library, University of Pittsburgh (AIS)

Mellon Institute of Industrial Research, papers

Historical Society of Western Pennsylvania

Select and Common Council Records (1806-1938)

Prothonotary’s Office, Pittsburgh, Pa.

Tarr, Joel, Personal Notes and Files

Public and Legal Documents


Pittsburgh, Pa. *Ordinances of the Select and Common Councils of the City of Pittsburgh ... Passed During the Year 1856 ...*. Pittsburgh: Whitney and Myers, 1857.


**Court cases and Judicial Decisions**

Answer of Jones and Laughlin Steel to the Bill of Complaint in the Above Case, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, September 12. 1902. (Available at the Prothonotary’s Office, City of Pittsburgh.)

674
Bill of Complaint, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, September 9, 1902. (Available at the Prothonotary’s Office, City of Pittsburgh.)


Decree, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, January 21, 1903. (Available at the Prothonotary’s Office, City of Pittsburgh.)


Findings of Fact, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, n. d. 1902 or 1903. (Available at the Prothonotary’s Office, City of Pittsburgh.)

Huckenstine’s Appeal, 70 Pa. 102, 1872 Pa. (Supreme Court of Pennsylvania, argued November 6, 1871, decided January 9, 1872).

Opinion, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, July 12, 1907. (Available at the Prothonotary’s Office, City of Pittsburgh.)

Petition, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, January 19, 1907; Answer, Decree, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company (available at the Prothonotary’s Office, City of Pittsburgh), January 19, 1907. (Available at the Prothonotary’s Office, City of Pittsburgh.)


Statement of Errors, Petition, Court of Common Pleas, Allegheny County No. 2, October Term 1902, Sitting in Equity Between E. R. Sullivan and Jennie P. A. Sullivan and Jones and Laughlin Steel Company, July 12, 1907. (Available at the Prothonotary’s Office, City of Pittsburgh.)

Sullivan v. Jones and Laughlin Steel Company, Appellant, 222 Pa. 72, 70 A. 775, 1908 Pa. (Supreme Court of Pennsylvania, February 17, 1908, argued June 23, 1908).


Poems


Novels and Short Stories


Warner, Frances Lester. “The Pittsburgh Owl.” (Supreme Council 33 of Freemasonry, 1925)

Films, Songs and Theatrical Performances

The Cradle Will Rock Performed 1937.

Pittsburgh. Universal Pictures Co.: 1942. Written by Kenneth Gamet and Tom Reed, based on an original story by George Owen and Tom Reed.

“Smoky Old Town.” Pete Seeger and Woody Guthrie. 1942.