

THE
Pennsylvania
Magazine
OF HISTORY AND BIOGRAPHY

*Large Firms and
Industrial Restructuring:
The Philadelphia Region,
1900-1980*

AT THE TURN OF THE TWENTIETH CENTURY, Philadelphia boosters proclaimed their city the world's workshop, a common boast of manufacturing centers yet one that on this occasion involved minimal stretching of the truth. Philadelphia led the nation in textile production, ship and locomotive building, and a dozen other categories; it also contained firms covering nearly nine-tenths of the Census Bureau's industrial classes, being the pivot around which a regional production complex had been articulated. Recognized by the Census as an "industrial district," the city and its seven adjacent Pennsylvania and New Jersey counties had generated a propulsive momentum that reached into virtually every cranny of the manufacturing system.¹

This research was supported by grants from the Rutgers University Research Council and the New Jersey Historical Commission. The author also had superior research assistance at the Woodrow Wilson Center, Smithsonian Institution, provided by James Luko of George Washington University.

¹ See U.S. Bureau of the Census, *Industrial Districts: 1905*, Bulletin no. 101 (Washington, 1909).

Clearly this is no longer the case, not by any measure. A city that in 1950 still sustained 350,000 industrial workers could in 1985 count barely 100,000, a 70 percent decline in little more than a generation. Analyses of decay and restructuring sound dissonant notes in the symphony of American progress, but in a context of heightened concern about multiple dimensions of economic and social wreckage, they can hardly be avoided. Scholars and citizens will surely differ as to whether the erosion of urban industrial systems is natural and efficient or engineered and wasteful, but documenting these processes and hazarding preliminary explanations for them should no longer be deferred.² This article will offer an overview of the Philadelphia region's diversified and extensive manufacturing array from the decades of confident prosperity through those of quiet crisis and failure. Focusing on large-scale employers, it can provide only one dimension of the shifts experienced, a fragment that despite its limitations adds substantively to our information base and our understanding of a complex historical process.

This discussion opens with a short review of Philadelphia's industrialization, then turns to assessment of rosters of the region's fifty largest manufacturing firms at six freeze-frame moments since 1900, focusing on sectoral and locational patterns and on the relation between large firm behavior and that of the wider industrial economy. A few remarks on the situation in 1990 will preface final thoughts on directions and dilemmas for further inquiry.

From its origins as an eighteenth-century port city, an entrepot for exchange of agricultural products and imported necessities or finery, Philadelphia traced a rather leisurely course during the early republic toward its vocation as an industrial giant. As Diane Lindstrom has demonstrated, the city owed its prosperity in large measure to the richness of the rural districts for which it became the market focal point. The western farm regions, the "breadbasket" of the Revolution,

² Anita Summers and Thomas Luce, *Economic Development in the Philadelphia Metropolitan Area* (Philadelphia, 1987), 210, 221; Michael Best, *The New Competition: Institutions of Industrial Restructuring* (Cambridge, MA, 1990) and, for a twentieth-century urban-industrial study (of Trenton, NJ), John Cumbler, *A Social History of Economic Decline* (New Brunswick, 1989).

continued to send forth diverse goods that found their way into both coastal and international trade well before the flowering of internal transport networks. Handling these commodities had the double effect of creating modest, if vulnerable, fortunes for city merchants and prized surpluses for outlying producers, both of which contributed to the city's early reputation as a supply center for quality consumer goods. Whereas light-weight items long continued to be imported, the heavier stuff, especially furniture, soon was locally crafted. Further, processing the vast stocks of grain from rural districts pressed millers toward mechanical innovation, notably the renowned Oliver Evans, whose continuous process model for grinding flour prefigured aspects of what would later be known as the "American system" of mass production.³

In the long run, however, it would not be Evans-style devices that would exemplify Philadelphia's approach to production. Instead, consistent with the custom work that made its furnishings desirable, the city would become a locus for batch and specialty manufacturing on a grand scale, not a site at which bulk outputs of staple products formed the base for profits. By the 1830s and 1840s, textiles and machinery had joined older craft trades as Philadelphia leaders, the former meeting demand for styled fabrics and the latter responding to the city's strategic spatial relations with the construction of the Pennsylvania Railroad. Fancy goods and locomotives, machine tools and carpets flowed from Philadelphia with apparent ease by mid-century. In 1860, the city featured as many textile workers as did famed Lowell and held the nation's most extensive network of "heavy" metalworking establishments.⁴

The Civil War showed the capacity of Philadelphia institutions to adapt to the North's needs for munitions, uniforms, blankets, and

³ Diane Lindstrom, *Economic Development of the Philadelphia Region, 1810-1850* (New York, 1978); Thomas Doerflinger, *A Vigorous Spirit of Enterprise* (Chapel Hill, 1986); David Hounshell, *From the American System to Mass Production* (Baltimore, 1984); Donald Hoke, *Ingenious Yankees* (New York, 1990); Thomas Cochran, *Frontiers of Change* (New York, 1982); Bruce Laurie, *Working People of Philadelphia, 1800-1850* (Philadelphia, 1980).

⁴ Philip Scranton, *Proprietary Capitalism* (New York, 1983); Matthew Gallman, *Mastering Wartime* (New York, 1990); *Historical and Commercial Philadelphia* (New York, 1893); *The Baldwin Locomotive Works* (Philadelphia, 1922); David Tyler, *The American Clyde: A History of Iron and Steel Shipbuilding on the Delaware from 1840 to World War I* (Newark, 1958).

warships, as well as provisioning and transporting its forces. Though the effects of the war's disruptions on economic development have not ceased to be debated, the city's old links with southern trade and sentiment were indeed severed.⁵ Its future lay within the industrial crescent from Boston through Cincinnati and Chicago, by meeting varied demands for producer and consumer goods attuned to the requirements of transport and manufacture and the vagaries of style. As immigration surged, Philadelphia exercised a selective magnetism on skilled factory veterans who frequently arrived already alert to the scores of potential employers in dozens of sectors and often with their own visions of proprietorship. This latter course was a rocky one during the economic fluctuations over the quarter century after 1873, when booms and depressions followed one another at a chilling pace. Still, Philadelphia industry was schooled in variation and seasoned to risk. Its leading figures had crafted both specialty products and a variegated collection of specialized institutions that circulated knowledge or money and served to reproduce or enhance skills. The Franklin Institute, the private textile school, design and business academies, the Wharton School and public manual training high school, the downtown Bourse, Manufacturers' and Engineers' clubs, the Commercial Museum, and at least a dozen banks and regional trade associations were the offspring of local industrial interests, as were an array of durable, company-based apprenticeship programs.⁶

By 1900, manufacturing development had also vitalized most of the smaller cities and towns in the counties adjacent to the metropolis. Chief among these was Camden, New Jersey, situated directly across the Delaware from Philadelphia's central business district. Camden's uncluttered waterfront drew investors who established the New York Shipbuilding Company's sheds and ways there, adding dramatically to an industrial concentration that already sported the Campbell food

⁵ Gallman, *Mastering Wartime*, chaps. 9-11; Stuart Bruchey, *Enterprise* (Cambridge, MA, 1990), 254-59. The development of Southern cotton yarn spinning capacity after 1880 and its gradual upgrading toward finer counts and better quality goods restored the Philadelphia industrial link by 1900. Southern mills supplied huge volumes of yarn to the city's expanding hosiery, lace, towel, and upholstery companies.

⁶ Russell Weigley, ed., *Philadelphia: A 300-Year History* (New York, 1982), 428-36, 471-83; Howell Harris, "Getting It Together," in Sanford Jacoby, ed., *Masters to Managers* (New York, 1991), 111-31.

plant and sundry textile mills, machine shops, and furniture work-rooms. At nearby Pennsylvania sites (Chester, Bristol, Norristown, Coatesville, Pottstown), similar clusters of works and mills took root, centered on textile or metalworking, most spectacularly in and about Chester where by 1918 ships, weapons, locomotives, yarns, and fabrics were all produced.⁷

The eight-county region, which reported 171,000 manufacturing workers in 1870, accounted for 311,000 in the 1900 Census. While large enterprises had emerged, the importance of small operations to the regional economy was indicated by the presence of 40,000 of that year's employees in shops with less than \$5000 worth of output (13 percent), a proportion matched only by New York among major American cities. As the Census did not thereafter include such tiny firms, their later significance cannot be gauged. However, the 271,000 workers numbered at bigger companies rose to 340,000 by 1909, swelled to 465,000 in the fevered 1919 boom, then slimmed to an average of 370,000 for most of the 1920s. The Great Depression pushed 100,000 operatives into unemployment by 1933, but half of them were back at work two years later during the first wave of recovery. As with earlier conflicts, World War II demand drew industrial employment to new heights, passing a half million. Postwar recessions made incursions into these totals, but by the early 1950s the aggregate figures looked terrific. With the Korean struggle in process, regional manufacturing employment reached its historic peak of 626,000; and through 1970, the aggregates oscillated with the economy, ranging from 533,000 to 583,000. Sadly, the next fifteen years, 1970-85, were an unmitigated disaster. Over 180,000 jobs vanished by 1985, when the eight-county industrial work force slipped below 400,000 for the first time since the 1930s.⁸ The city proper fared

⁷ Textile entrepreneurs from Philadelphia and the close-to-hand Upland and Rockdale districts were early industrializers at Chester. They were in time joined by Baldwin's gradual relocation of its traction plants to Eddystone (and siting of wartime gun and ammunition works there) and by the yards of what became Sun Shipbuilding. See Anthony Wallace, *Rockdale* (New York, 1978); Philip Scranton and Walter Licht, *Work Sights: Industrial Philadelphia, 1890-1950* (Philadelphia, 1986); and New York Shipbuilding Corporation, *The New York Shipbuilding Corporation: A History and Record* (New York, 1931).

⁸ Glenn McLaughlin, *Growth of American Manufacturing Areas* (Pittsburgh, 1938); Summers and Luce, *Economic Development*, 17-18, 232-34.

worse than its surroundings, suggesting that there are, at a minimum, three dimensions to analyzing the dynamics of industrial restructuring: temporal, spatial, and sectoral characteristics. Regional aggregates hint only at the temporal shifts and are opaque on the other counts. It is hoped that somewhat greater clarity can be achieved in this paper by blending analysis of cohorts of the region's largest firms with a narrative that reaches beyond them toward their less prominent brethren and the wider business environment.⁹

Industrial Philadelphia was a city of specialists strongly concentrated in the textile, apparel, and metalworking trades, which together accounted for three-fifths of manufacturing employment in the early twentieth century. Three rosters of the largest regional firms (Tables 1-6) show this sectoral dominance in the 1900s, 1920s, and 1930s and the centrality of the city to the production system. Throughout these four decades, Philadelphia's share of metropolitan industrial employment ranged from three-quarters to two-thirds of the area total, proportions closely matched by the top fifty group except during the Great Depression. The gradual suburbanization of production, obvious at Boston or Pittsburgh (where only 27 percent of industrial jobs could be found in the core city in 1929), was much less pronounced in the Philadelphia region before World War II. This differential can be credited to the spatial structure of the batch manufacturing format as well as to the city's historical political geography.¹⁰

Philadelphia's industrial neighborhoods, packed with mills and workshops, and their sectoral diversity fostered networks of interdependence at the local level that featured both informal and formal contacts among firms making complex or seasonal goods, a pattern of "rela-

⁹ As Sanford Jacoby has recently outlined, accounts of significant change in the business system generally follow one of three lines of explanation. The internalist approach stresses shifts in organizational and technological resources at the level of the firm, following the lead of Alfred Chandler. The environmental argument focuses on contextual factors: labor supply, state-business relations, costs of capital, or structural changes in demand. The argument for contingent factors stresses situational complexities and abjures social science-like searches for overarching principles of development, instead seeking to document mid-range patterns without a presumption of universality. This study is located in that third domain. See Jacoby, *Masters to Managers*, introduction.

¹⁰ Summers and Luce, *Economic Development*, 210; McLaughlin, *Growth*, 129.

tional contracting" common in industrial districts possessing many specialized, partial process firms. Links between spinners, dyers, designers, and weaving and knitting enterprises were central to a *dis*-integrated format for production, as were parallel connections between pattern-makers, alloy metal firms, foundries, machine shops, and machinery builders. Peopled by thousands of homeownership skilled workers residing near factory spaces that could be rented "with power," these districts long proved ideal sites for locating new enterprises. They were more elaborate variations on the printing or apparel clusters of Manhattan, the jewelry nexus at Providence, or the furniture centers of Grand Rapids, Michigan, and Jamestown, New York. So long as demand for final goods continued to be diverse and robust, and technical innovation supported profitability, the spatial propinquity of specialist firms could yield a collective prosperity. Their vitality into the 1930s reinforced the city's leadership of regional manufacturing.¹¹

At the same time, Philadelphia's industrial complexes continued to have room for growth within the county boundaries, a consequence of the 1854 annexations that created a political unit embracing over 125 square miles of territory. Just as Disston Saw had removed from its original location near the downtown to virgin terrain along the Delaware at Tacony in the late nineteenth century, so too could later manufacturers expand by building new facilities beyond Frankford in the northeast, above central north Philadelphia, or below the built-up areas of south and southwest Philadelphia, open sites that also welcomed incoming branch plants of nationally prominent corporations (e.g., General Electric). Thus, unlike Newark or Providence, Philadelphia was long immune from witnessing the placement of most new regional factories beyond its political boundaries in separate jurisdictions.¹²

¹¹ Oliver Williamson, *The Economic Institutions of Capitalism* (New York, 1985); Metropolitan Survey of New York, *The Printing Trades* (New York, 1925); Howell Harris, "Little Drops of Water, Little Grains of Sand," *Technology and Culture* (forthcoming); Philip Scranton, "Diversity in Diversity," *Business History Review* 65 (1991), 166-207.

¹² Harry Silcox, "Henry Disston's Model Industrial Community," *Pennsylvania Magazine of History and Biography* 114 (1990), 483-515; Floyd Parsons, ed., *New Jersey: Life, Industries and Resources* (Newark, 1928); Massachusetts Institute of Technology, Division of Industrial and Municipal Research, *Industrial Survey of Metropolitan Providence* (Providence, 1928).

Sectorally, the first two tables give a sense of the industrial scene in this century's first decade. Of the twenty firms with over a thousand employees, thirteen operated in Philadelphia, including six of the top eight. At the peak of its prowess, Baldwin Locomotive headed the list, having moved far beyond its early links with eastern railways to supply engines to the Santa Fe and carry on an extensive international trade, including heralded exports to the previously impenetrable British market.¹³ Unlike Cramp's and New York Ship, which engaged in extensive contracting for vessel components, Baldwin was nearly self-contained, working up the bulk of the thousands of parts that comprised its innovative Vaucrain compound or Mallet locomotives. Midvale, Dobson, Disston, and Stetson were similarly integrated, which accounts for their huge work forces, yet none of them mass produced staple goods of the sort that flowed from Pittsburgh steel or Fall River textile mills. Midvale focused on alloys and armor plate, using its extensive machine shops to fashion armaments and ship engine crankshafts. Dobson spun and dyed most of its own yarns for the hundreds of styles it offered in carpets, suitings, and household fabrics, but like its Civil War predecessors was able rapidly to shift into "government goods" when preparedness again became the watchword. Even though Henry Disston's Sons made their own crucible steel and bought applewood by the carload for saw handles, each of their products was the result of skilled handwork and special orders were executed with precision. Stetson covered the hatmaking process from pelts to boxes, but as well sent forth scores of styles that changed seasonally and sustained the company's reputation for fashion and quality. The biggest firms, however atypical as to size, were thus perfectly consistent with the regional prevalence of batch and specialty enterprise.¹⁴

Custom and batch processing likewise pervades the rest of the roster. In leather, Philadelphia firms stood at the top end of the trade, tanning kid and glazed leathers for women's shoes and purses, bookbinding, and fancy work, in contrast to midwestern plants that worked heavy hides destined for men's work shoes, power belting, or butchers'

¹³ Charles Rous-Martin, "English and American Locomotive Building," *Engineering Magazine* 17 (1899), 545-61. See also H. Keith Trask, "Latter-Day Developments of the American Locomotive," *Engineering Magazine* 38 (1909-10), 195-214, 342-60.

¹⁴ Scranton and Licht, *Work Sights*; Philip Scranton, *Figured Tapestry* (New York, 1989).

aprons.¹⁵ Brill matched Baldwin's international reach in outfitting overseas traction companies along with meeting domestic demand for street cars, while the Bromleys mirrored Dobson's diversity in the third generation of their textile enterprises, adding upholsteries, curtains, and lace to their beginnings in carpets.¹⁶ To be sure, a minority of the leading firms oriented their activities to bulk manufacturing (in steel, Lukens, Tidewater, Worth, and John Wood) or continuous flow production (Atlantic Refining and Sprekels Sugar), but overall 34 of these 50 firms lay outside the world of industrial throughput and routinization and employed five-sixths of the roster's total work force. Equally important, like the city's thousands of smaller companies, the vast majority of its great firms were locally owned and operated, partaking of a personal or proprietary managerial style quite distinct from the bureaucratic hierarchies pioneered by railroads and brought into manufacturing circles by "modern business enterprises" like Standard Oil or Du Pont.¹⁷ Both these features would alter during the next quarter century.

Sectorally, regional leaders occupied twelve of the Census's twenty Standard Industrial Classifications (Sector Classifications), with only two sectors that commonly included very large firms being absent (chemicals and rubber).¹⁸ As Table 2 illustrates, twenty-seven compa-

¹⁵ For more on the regional leather trades, see Yda Schreuder, "The Impact of Labor Segmentation on the Ethnic Division of Labor and the Immigrant Residential Community: Polish Leather Workers in Wilmington, Delaware, in the Early Twentieth Century," *Journal of Historical Geography* 16 (1990), 402-24.

¹⁶ Both John Bromley and Sons and Lehigh Manufacturing in Table 1 were Bromley family firms, as were several smaller firms. See Philip Scranton, "Build a Firm, Start Another," *Business History* (UK), forthcoming.

¹⁷ Alfred Chandler, *The Visible Hand* (Cambridge, MA, 1977). Chandler developed the concept, "throughput," to indicate the achievement of economies of speed in production by means of both technical and organizational reductions in cycle times for transforming materials into finished goods.

¹⁸ In paper goods, the merger that created International Paper added one very large company to a trade chiefly composed of individual mills or smaller groupings. However, the diversity of paper product markets quickly exhausted the economies of scale that might have been imagined to derive from building immense plants. At least through World War I, International Paper was little more than a holding company for many average sized factories and had trouble achieving profitability, as a Bureau of Corporations inquiry showed. See Interview Summaries and Reports, Paper Trust Investigation, Bureau of Corporations, Records of the Bureau of Corporations and Federal Trade Commission, Record Group 122, National Archives, Boxes 817 and 818.

nies having two-thirds of the top fifty's employees stemmed from textiles, metalworking, and transportation equipment; and the group as a whole represented one-fourth of the metropolitan work force, the rest of whom (225,000 strong) were distributed among some 9,000 other firms. Moreover, Philadelphia was plainly the industrial hub; 72 percent of the largest firms and three-quarters of employees in the top fifty were centered there.

Despite two recessions (1907-08, 1913-14) and war era inflation, Philadelphia industries advanced on multiple fronts through 1920. In textiles, the technically sophisticated production of silk full-fashioned hosiery and cotton lace pivoted nationally around the activities of pioneering mills in Kensington and Frankford, and American Viscose situated its first sizable rayon fiber plant at Marcus Hook, near Chester. Both Brown Instrument and Leeds and Northrup carved out durable territories in scientific instruments, while General Electric and Westinghouse invested in major facilities for heavy electrical and marine engine manufacturing in south Philadelphia and Lester, just southwest of the city limits. Baldwin, having outgrown its inner city shops, sunk millions into a new factory complex at Eddystone, again near Chester, and, like Midvale, reaped millions in wartime contracts. The transatlantic conflict kept existing Delaware River shipyards filled to capacity with orders; it also spawned Stone and Webster's famous subsidiary, American International Shipbuilding Corporation, for "mass" production of vessels at Hog Island.¹⁹ Despite a series of confrontations with workers and the persistence of sweatshop subcontracting in the "rag trade," the regional industrial system seemed poised for extending its achievements on all fronts.²⁰

Instead, the 1920s roared only selectively among the divisions of area manufacturing. Two of the three most important sectors stagnated or declined, while notable advances were made elsewhere. For different reasons, both shipbuilding and locomotive construction faltered.

¹⁹ Scranton, *Figured Tapestry*; W.C. Mattox, *Building the Emergency Fleet* (Cleveland, 1920); "Westinghouse Marine Engineering Works," *Machinery* 25 (1918-19), 538-44, 789-96; David Keller, *Stone and Webster, 1889-1989* (New York, 1989), 99-110; Scranton and Licht, *Work Sights*; William Vogel, Jr., *Precision, People and Progress* (Philadelphia, 1949).

²⁰ On apparel trade conditions, see Elden LaMar, *The Clothing Workers in Philadelphia* (Philadelphia, 1940); and Commission on Industrial Relations, *Final Document and Testimony*, (11 vols., Washington, 1916), 4:3003-3171.

Standard Two-Digit Census Industrial Classifications

Sector	Industry Description
20	Food and Kindred Products Includes meat, dairy, grain, bakery, sugar, packaged goods, beverages.
21	Tobacco Manufactures
22	Textile Mill Products All goods from yarn, weaving and knitting mills, plus fabric finishing establishments.
23	Apparel and Other Textile Products (includes Hats)
24	Lumber and Wood Products
25	Furniture and Fixtures
26	Paper and Allied Products
27	Printing and Publishing
28	Chemicals and Allied Products Includes pharmaceuticals, soap, paint, and plastic materials.
29	Petroleum and Coal Products
30	Rubber and Miscellaneous Plastic Products (fabricated)
31	Leather and Leather Products
32	Stone, Clay, and Glass Products
33	Primary Metal Industries Includes ferrous and non-ferrous, and foundry goods.
34	Fabricated Metal Products Includes tools, hardware, forgings, ordnance, cans, and plumbing goods.
35	Machinery, Except Electrical Includes engines, machinery for farms, construction, production, and mining, machine tools, pumps, office machines, refrigeration, and sewing machines.
36	Electric and Electronic Equipment Includes distribution systems, industrial and household equipment, radio, TV, and communication devices, electronic components and parts.
37	Transportation Equipment Includes motor vehicles, railway, ships, aircraft and space transportation, parts and accessories.
38	Instruments and Related Products Includes engineering, scientific, optical, and medical instruments, photographic equipment, and clocks.
39	Miscellaneous Manufacturing Industries Residual, covering jewelry, toys, sporting goods, musical goods, office supplies, and art materials.

Source: Office of Management and Budget, *Standard Industrial Classification Manual: 1972* (Washington, D.C., 1972) Division D: Manufacturing.

Table 1
50 Largest Industrial Firms, Philadelphia Region, 1902-06

Name	Location ^a	Products	Employment	Sector ^b
1. Baldwin Locomotive	PHL	Locomotives	11,024	37
2. William Cramp & Sons	PHL	Ships/Engines	7,100	37
3. N. Y. Shipbuilding Co.	NJ	Ships	4,000	37
4. Pencoyd Iron Works	PA	Structural Steel	3,000	34
5. Midvale Steel Co.	PHL	Armor/Alloy Steel	3,000	33
6. John & James Dobson	PHL	Carpets/Woolens	2,933	22
7. Henry Disston & Sons	PHL	Saws/Files/Tools	2,425	34
8. John B. Stetson Co.	PHL	Hats (felt & straw)	2,150	23
9. Atlantic Refining Co.	PHL	Petroleum Products	2,055	29
10. Phoenix Iron Co.	PA	Structural Steel	1,809	34
11. Robert Foederer	PHL	Leather (kid/glazed)	1,768	31
12. American Cigar Co.	PHL,NJ	Cigars	1,673	21
13. Southwark Mills	PHL	Cottons/Worsted	1,489	22
14. J.C. Brill Co.	PHL	Street cars	1,470	37
15. Imperial Woolen Co.	PHL	Woolen Yarn/Cloth	1,325	22
16. Neafie & Levy Ship Co.	PHL	Ships/Engines	1,240	37
17. Eddystone Mfg. Co.	PA	Cotton Printing	1,220	22
18. Spreckels Sugar	PHL	Sugar Refining	1,190	20
19. John Bromley & Son	PHL	Household Fabrics	1,185	22
20. Keystone Watch Case Co.	PHL	Gold/Silver Goods	1,147	39
21. Hoopes & Townsend	PHL	Nuts/Bolts	1,100	34
22. Camden Iron Works	NJ	Machinery/Pipe	1,010	35
23. Joseph Campbell Co.	NJ	Canned Food	1,000	20
24. Lukens Iron & Steel Co.	PA	Iron/Steel Plates	980	33
25. Tidewater Steel Co.	PA	Steel Plates	895	33
26. Lehigh Mfg. Co.	PHL	Lace/Curtains	867	22
27. J.P. Mathieu & Co.	PHL	Leather (kid/glazed)	835	31
28. Enterprise Mfg. Co.	PHL	Hardware	800	34
29. William Sellers & Co.	PHL	Machine Tools	796	35
30. S.B. Fleisher & Brother	PHL	Wool/Worsted Yarn	750	22
31. Bement Miles Co.	PHL	Machine Tools	710	35
32. James Dunlap Carpet Co.	PHL	Wool Carpets	705	22
33. Laird, Schober & Co.	PHL	Styled Shoes	700	31
34. Hero Fruit Jar Co.	PHL	Sheet Metal Novelties	700	34
35. Abr. Kirschbaum & Co.	PHL	Men's Clothing	681	23
36. Brown, Aberle & Co.	PHL	Silk Hosiery	680	22

Table 1--Continued

37. Jno. Bailey & Co.	PHL	Cordage	672	22
38. Follwell Bros. & Co.	PHL	Wool/Worsted Fabrics	670	22
39. Penn Iron Works	PHL	Engines/Machinery	648	35
40. Worth Bros. & Co.	PA	Steel Plate	624	33
41. Hoyle, Harrison & Kaye	PHL	Upholstery/Fabrics	607	22
42. Teutelman Bros. & Faggen	PHL	Shirts	600	23
43. Henry Roelofs & Co.	PHL	Hats	600	23
44. Pilling & Madeley	PHL	Seamless Hosiery	600	22
45. Samuel Fretz	PHL	Umbrellas	600	39
46. John Wood Bros.	PA	Sheet Iron	600	33
47. E.T. Steel & Co.	PA	Worsted Yarns	600	22
48. Welsbach Light Co.	NJ	Cloth Gas Mantles	600	22
49. Victor Talking Machine Co.	NJ	Phonographs/Parts	600	36
50. McNeely Co.	PHL	Leather (kid)	599	31

*Location: PHL-Philadelphia; PA-Pennsylvania Suburbs; NJ-New Jersey.

^bStandard Two-Digit Census Industrial Classifications (see table)

Sources: Commonwealth of Pennsylvania, *Thirteenth Annual Report of the Factory Inspector* (Harrisburg, 1903); *Industrial Directory of New Jersey* (Trenton, 1906).

Table 2
50 Largest Industrial Firms, Philadelphia Region, 1902-06
Employment by Sector and Location

Sector	Firms			Employment			Total	% of Top 50
	PHL	PA	NJ	PHL	PA	NJ		
Foods	1	0	1	1,190	0	1,000	2,190	3
Tobacco	1	0	1	1,023	0	650	1,673	2
Textiles	12	2	1	12,483	1,820	600	14,903	20
Apparel	4	0	0	4,031	0	0	4,031	5
Petroleum	1	0	0	2,055	0	0	2,055	2
Leather	4	0	0	3,902	0	0	3,902	5
Primary Metals	1	4	0	3,000	3,099	0	6,099	8
Fabricated Metals	4	2	0	5,025	5,809	0	10,834	14
Machinery	3	0	1	2,154	0	1,012	3,166	4
Electrical Goods	0	0	1	0	0	600	600	1
Transport Equip.	4	0	1	21,413	0	4,000	25,413	33
Miscellaneous	2	0	0	1,747	0	0	1,747	2
Totals	37	8	6	58,023	10,728	7,862	76,413	99
Percent of Top 50 Employment				76%	14%	10%		

Top 50 Firms Percent of Total Regional Industrial Employment 24%

Sources: Table 1 and *Census of Manufactures* (1905); *Philadelphia Industrial Districts* (Washington, D.C., 1909).

Table 3
50 Largest Industrial Firms, Philadelphia Region, 1927-28

Name	Loc.	Products	Employment	Sector
1. Baldwin Locomotive	PA	Locomotives	7,523	37
2. N.Y. Ship	NJ	Ships	7,500	37
3. Victor Talking Machine Co.	NJ	Phonographs/Parts	7,100	36
4. Atlantic Refining Co.	PHL	Gasoline, etc.	5,984	29
5. Curtis Publishing Co.	PHL	Printing	4,735	27
6. Edward Budd Mfg. Co.	PHL	Automobile Bodies	4,669	37
7. Viscose Co.	PA	Rayon Yarn	4,335	22
8. John B. Stetson Co.	PHL	Hats (felt & straw)	4,080	23
9. Campbell Soup Co.	NJ	Canned Food	3,600	20
10. Atwater Kent Mfg. Works	PHL	Radios/Elec. Products	3,263	36
11. Electric Storage Battery	PHL	Electrical Supplies	3,167	36
12. Collins & Aikman Co.	PHL	Upholstery Fabrics	3,046	22
13. General Electric Co.	PHL	Electrical Supplies	2,762	36
14. Westinghouse Electric Co.	PA	Turbines/Parts	2,443	36
15. Aberfoyle Mfg. Co.	PA	Cotton Yarn/ Thread	2,243	22
16. Sun Shipbuilding Co.	PA	Ships	2,153	37
17. Bayuk Cigars, Inc.	PHL	Cigars	2,146	21
18. Henry Disston & Sons, Inc.	PHL	Saws/Files	2,108	34
19. Lukens Steel Co.	PA	Iron/Steel Plates	1,933	33
20. Midvale Steel Co.	PHL	Iron/Steel Forgings	1,820	34
21. Vacuum Oil Co.	NJ	Oil Refining	1,795	29
22. Apex Hosiery	PHL	Silk Hosiery	1,769	22
23. S.B. & B.W. Fleisher, Inc.	PHL	Wool/Worsted Yarns	1,654	22
24. J.G. Brill Co.	PHL	Streetcars/Parts	1,653	37
25. Consolidated Cigar Co.	PHL	Cigars	1,609	21
26. Bulletin Co.	PHL	Daily Newspapers	1,562	27
27. Gotham Silk Hosiery Co.	PHL	Silk Hosiery	1,512	22
28. Phila. Storage Battery	PHL	Electrical Supplies	1,473	36
29. Congress Cigar Co.	PHL	Cigars	1,448	21
30. Philadelphia Inquirer	PHL	Daily Newspapers	1,441	27
31. Freihofer Baking Co.	PHL	Bread/Bakery Goods	1,381	20
32. Bethlehem Steel (Worth)	PA	Iron/Steel Plates	1,361	33
33. General Baking Co.	PHL	Bread/Bakery Goods	1,289	20
34. Stephen Whitman & Son	PHL	Boxed Candy	1,249	20
35. John Bromley & Sons Inc.	PHL	Lace Goods	1,244	22
36. Laird, Schober & Co.	PHL	Styled Shoes	1,228	31

Table 3--Continued

37. James Lees & Sons	PA	Wool/Worsted Yarn	1,214	22
38. Pheonix Iron Co.	PA	Structural Metals	1,207	34
39. McClintock Marshall Co.	PA	Structural Iron/Steel	1,167	34
40. Dupont Co.	PHL	Paints/Varnishes	1,164	28
41. H.C. Aberle Co.	PHL	Silk Hosiery	1,156	22
42. Sun Oil Co.	PA	Gasoline, etc.	1,115	29
43. Triumph Hosiery Mills	PHL	Silk Hosiery	1,113	22
44. GHP Cigar Co.	PHL	Cigars	1,097	21
45. National Biscuit Co.	PHL	Bakery Products	1,093	20
46. Pennsylvania Sugar Co.	PHL	Sugar Refining	1,088	20
47. David Lupton's Sons Co.	PHL	Roofers Supplies	1,043	34
48. American Engineering Co.	PHL	Machinery/Parts	1,031	35
49. Welsbach Co.	NJ	Gas Lamps/Heaters	1,000	34
50. Abr. Kirschbaum Co.	PHL	Men's Clothing	961	23

Sources: *Industrial Directory of New Jersey: 1927* (Trenton, 1928); *Sixth Industrial Directory of Pennsylvania* (Harrisburg, 1928).

Table 4
50 Largest Industrial Firms, Philadelphia Region, 1927-28
Employment by Sector and Location

Sector	Firms			Employment			Total	% of Top 50
	PHL	PA	NJ	PHL	PA	NJ		
Foods	5	0	1	6,100	0	3,600	9,700	8
Tobacco	4	0	0	6,300	0	0	6,300	5
Textiles	7	3	0	11,494	7,792	0	19,286	17
Apparel	2	0	0	5,041	0	0	5,041	4
Printing	3	0	0	7,738	0	0	7,738	7
Chemicals	1	0	0	1,169	0	0	1,169	1
Petroleum	1	1	1	5,894	1,115	1,795	8,804	8
Leather	1	0	0	1,288	0	0	1,288	1
Primary Metals	0	2	0	0	3,294	0	3,294	3
Fabricated Metals	2	2	1	2,665	2,374	1,000	6,039	5
Machinery	2	0	0	2,851	0	0	2,851	2
Electrical	4	1	1	11,025	2,443	7,100	20,568	18
Transport Equip.	3	1	1	13,845	2,153	7,500	23,498	21
Totals	35	10	5	75,410	19,171	20,995	115,576	100
Percent of Top 50 Employment				65%	17%	18%		

Top 50 Firms Percent of Total Regional Industrial Employment 32%

Source: Table 3.

Table 5
50 Largest Industrial Firms, Philadelphia Region, 1934-35

Name	Loc. Products	Employment	Sector
1. RCA Victor (VT Mach.)	NJ Phonographs/Records	10,000	36
2. Atlantic Refining Co.	PHL Gasoline, etc.	5,822	29
3. Philco (Ph. Stor. Battery)	PHL Radios/Parts	5,178	36
4. Viscose Co.	PA Rayon Yarn/Thread	4,000	22
5. N.Y. Ship	NJ Ships	3,915	37
6. Edward Budd Mfg. Co.	PHL Auto/Truck Bodies	3,533	37
7. Curtis Publishing Co.	PHL Periodicals	2,984	27
8. John B. Stetson Co.	PHL Hats (felt & straw)	2,937	23
9. John A. Roebling's Sons	NJ Wire/Wire Rope	2,581	34
10. Bayuk Cigars, Inc.	PHL Cigars	2,468	21
11. Ford Motor Co.	PA Auto Parts	2,321	37
12. Campbell Soup Co.	NJ Food Products	2,258	20
13. Apex Hosiery Co.	PHL Silk Hosiery	2,209	22
14. Electric Storage Battery	PHL Electric Supplies	2,148	36
15. Sun Oil Co.	PA Gasoline, etc.	2,146	29
16. Westinghouse Electric Co.	PA Turbines/Parts	2,142	36
17. Lukens Steel Co.	PA Iron/Steel Plates	2,051	33
18. Continental Distilling	PHL Whiskey/Liquors	1,843	20
19. James Lees & Sons Co.	PA Wool/Worsted Yarns	1,751	22
20. Sun Shipbuilding Co.	PA Ships	1,660	37
21. Vacuum Oil Co.	NJ Petroleum Products	1,633	29
22. Bulletin Co.	PHL Newspapers	1,510	27
23. Aberfoyle Mfg. Co.	PA Cotton Yarn/Thread	1,491	22
24. Gotham Silk Hosiery Co.	PHL Silk Hosiery	1,481	22
25. Henry Disston & Sons	PHL Saws/Files	1,417	34
26. General Baking Co.	PHL Bread/Bakery Goods	1,415	20
27. S. Makransky & Sons	PHL Men's Clothing	1,407	23
28. Quaker Hosiery Co.	PHL Silk Hosiery	1,273	22
29. Atwater Kent Mfg. Works	PHL Radios/Parts	1,211	36
30. American Tobacco Co.	PHL Cigars	1,159	21
31. Freihofer Baking Co.	PHL Bread/Bakery goods	1,127	20
32. Philadelphia Inquirer	PHL Newspapers	1,106	27
33. Consolidated Cigar Corp.	PHL Cigars	1,086	21
34. General Electric Co.	PHL Electrical Machinery	1,062	36
35. Kieckcofer Container Co.	NJ Corrugated Boxes	1,020	26
36. Sinclair Refining Co.	PA Gasoline	1,010	29

Table 5--Continued

37. Collins & Aikman Corp.	PHL	Upholstery Fabrics	1,001	22
38. Sharpe & Dohme, Inc.	PHL	Pharmaceuticals	990	28
39. Phoenix Iron Co.	PA	Iron/Steel Plates	983	33
40. Baldwin Locomotive	PA	Locomotives	981	37
41. Pennsylvania Sugar Co.	PHL	Sugar Refining	971	20
42. Florence Pipe Foundry	NJ	Pipe/Hydrants, etc.	950	34
43. Surpass Leather Co.	PHL	Leather (Curried)	942	31
44. McClintock Marshall Corp.	PA	Structural Iron/Steel	927	34
45. Congress Cigar Co.	NJ	Cigars	900	21
46. Congoleum Nairn, Inc.	PA	Linoleum/Oil Cloth	861	39
47. Container Corp. of Amer.	PHL	Cardboard/Boxes	860	26
48. U.S. Pipe & Foundry	NJ	Iron Pipe/Castings	825	34
49. Stephen Whitman & Son	PHL	Boxed Candy	821	20
50. Charles Cochran Co.	PHL	Wool Carpets & Rugs	802	22

Sources: *Industrial Directory of New Jersey for 1934* (Trenton, 1935); *Eighth Industrial Directory of Pennsylvania* (Harrisburg, 1935).

Table 6
50 Largest Industrial Firms, Philadelphia Region, 1934-35
Employment by Sector and Location

Sector	Firms			Employment			Total	% of Top 50
	PHL	PA	NJ	PHL	PA	NJ		
Foods	5	0	1	6,177	0	2,258	8,435	9
Tobacco	3	0	1	4,713	0	900	5,613	6
Textiles	6	3	0	8,173	7,242	0	15,415	16
Apparel	2	0	0	4,344	0	0	4,344	4
Paper Goods	1	0	1	860	0	1,020	1,880	2
Printing	3	0	0	5,600	0	0	5,600	6
Chemicals	1	0	0	990	0	0	990	1
Petroleum	1	2	1	5,822	3,156	1,653	10,611	11
Leather	1	0	0	942	0	0	942	1
Primary Metals	0	2	0	0	3,034	0	3,034	3
Fabricated Metals	1	0	3	1,417	0	4,356	5,773	6
Electrical	4	1	1	9,599	2,142	10,000	21,741	22
Transport Equip.	1	3	1	3,533	4,962	3,915	12,410	13
Miscellaneous	0	0	1	0	0	861	861	1
Totals	29	12	9	52,170	21,397	24,963	97,649	101
Percent of Top 50 Employment				53%	22%	25%		

Top 50 Firms Percent of Total Regional Industrial Employment 31%

Source: Table 5.

Table 7
50 Largest Industrial Firms, Philadelphia Region, 1956

Name	Loc.	Products	Employment	Sector
1. Philco Radio Corp.	PHL PA	Radios/Parts	11,787 <u>3,735</u> 15,522	36
2. Budd Co.	PHL	Auto Bodies/RR Cars	10,284	37
3. Westinghouse Electric Co.	PA	Electrical Machinery	10,569	36
4. RCA	NJ	Radios/Parts	8,000*	36
5. Kaiser Metal Products	PA	Aircraft/Parts	6,836	37
6. Curtis Publishing Co.	PHL PA	Periodicals	5,088 <u>1,107</u> 6,195	27
7. U.S. Steel Corp.	PA	Steel Sheet & Tube	6,187	33
8. N.Y. Ship	NJ	Ships/Repairs	5,550	37
9. General Electric Co.	PHL	Electrical Machinery	5,277	36
10. Lukens Steel Co.	PA	Iron/Steel Plates	4,916	33
11. Baldwin-Lima-Hamilton	PA	Locomotives	4,819	37
12. Campbell Soup Co.	NJ	Food Products	4,500*	20
13. Sun Oil Co.	PA	Gasoline	4,342	29
14. Rohm & Hass Co.	PHL PA	Specialty Chemicals	2,090 <u>2,111</u> 4,201	28
15. Atlantic Refining Co.	PHL	Gasoline, etc.	4,166	29
16. Piasecki Helicopter Co.	PA	Aircraft/Parts	4,018	37
17. ITE Circuit Breaker Co.	PHL	Electrical Equipment	3,675	36
18. SKF Industries	PHL	Bearings/Pulleys	3,232	35
19. Minn.-Honeywell (Brown Instruments)	PHL	Instrumentation	3,088	38
20. Heintz Mfg. Co.	PHL	Auto Parts	3,037	37
21. Triangle Publications (Phila. Inquirer)	PHL	Newspapers, etc.	3,036	27
22. Leeds & Northrup Co.	PHL	Instrumentation	3,006	38
23. Sun Shipbuilding Co.	PA	Ships	2,763	37
24. Firestone Tire & Rubber	PA	Tires	2,707	30
25. Bayuk Cigar Co.	PHL	Cigars	2,704	21
26. Yale & Towne Mfg. Co.	PHL	Electrical Machinery	2,694	36
27. Socony Mobil Oil Co.	NJ	Petroleum Refining	2,650	29
28. Midvale Co.	PHL	Iron/Steel Forgings	2,526	34
29. Alan Wood Steel Co.	PA	Sheet Iron/Steel	2,405	33
30. Crown Cork & Seal	PHL	Sheet Metal Goods	2,376	34

Table 7--Continued

31. Ford Motor Co.	PA	Vehicles/Parts	2,291	37
32. Scott Paper Co.	PA	Paper Tissues, etc.	2,265	26
33. S.F. Whitman & Son	PHL	Boxed Candy	2,191	20
34. Link Belt Co.	PHL	Machinery/Parts	1,168	35
	PA		<u>885</u>	
			2,053	
35. John B. Stetson Co.	PHL	Hats	2,024	23
36. Bulletin Co.	PHL	Newspapers	2,009	27
37. Merck & Co., Inc.	PHL	Pharmaceuticals	1,196	28
	PA		<u>754</u>	
			1,950	
38. Cuneo Eastern Press	PHL	Printed Goods	1,948	27
39. Bethlehem Steel Co.	PA	Structural Steel	1,874	34
40. H. Daroff & Sons, Inc.	PHL	Men's Clothing	1,851	23
41. Radio Condenser Co.	NJ	Electrical Supplies	1,825	36
42. Disston Div./H.K. Porter	PHL	Saws	1,822	34
43. Gulf Oil Co.	PHL	Gasoline, etc.	1,783	29
44. Standard Pressed Steel Co.	PA	Specialty Hardware	1,728	34
45. Tasty Baking Co.	PHL	Baked Goods	1,691	20
46. Container Corp. of America	PHL	Boxes/Cardboard	1,656	26
47. Smith, Kline & French	PHL	Pharmaceuticals	1,583	28
48. Doehler-Jarvis Div./Nat'l. Lead	PA	Aluminum Products	1,551	34
49. Amer. Machine & Metals	PA	Instrumentation	1,533	38
50. Sinclair Refining	PA	Gasoline, etc.	1,412	29

*estimated

Sources: *Fourteenth Industrial Directory of Pennsylvania* (Harrisburg, 1956);
Industrial Directory of New Jersey for 1956 (Trenton, 1957).

The surfeit of ships launched during the war, followed by scaled-down navy construction during the era of partial disarmament, unsettled the shipbuilding trades. Though New York Ship stabilized as one of the national "Big Three" (along with Fore River in Massachusetts and the Newport News yards), Cramp's closed down, as did several other Delaware River enterprises, until World War II brought a brief revival. Baldwin management erred doubly, expanding capacity at a time when shaky railroad finances thinned motive power equipment orders, and retaining a commitment to refining steam traction, just as the superiority of diesel and electric locomotives was being established. Experiencing setbacks in the 1920s, the company slipped into receivership during the Depression and never recovered either its vaunted status or its technical momentum. In textiles, the inventory depression of 1920-21 brought a seemingly permanent shift in market power relations that radically eroded profitability.²¹

Hence by the late 1920s, the big firm roster (Tables 3 and 4) shows substantial effects of these shifting tides, as well over half of the original group slipped from the rungs of regional leadership. Simple inspection of the tables provides several clues to the pattern of change. Employment in the fifty largest companies in 1927-28 was more than 50 percent higher than the comparable earlier figures, whereas the aggregate regional industrial work force had increased only 22 percent. Further, the smallest firm in the later group was half again as large as in the century's first decade. Clearly, differential rates of expansion played a major role in the pattern of additions and deletions, a phenomenon to which sectoral limits to firm growth and larger vectors of market and technological change both contributed.

The textile industry exemplifies one dimension of this restructuring. Of the fifteen 1902-06 textile companies, eleven either contracted or expanded insufficiently to hold their places (though two of these would reappear on the Depression-era roster). Hoyle, Harrison and Kaye and the great Dobson family firm had liquidated entirely, the latter's aging chieftain having failed to school an effective successor. The persistent miseries of the woolen trades, which were bringing annual losses to New England's giant American Woolen, had battered Folwell, which

²¹ David Palmer, "Organizing the Shipyards" (Ph.D. diss., Brandeis University, 1990); Scranton and Licht, *Work Sights*.

also buried its founder, and the stagnating market for seamless hosiery undercut Pilling and Madely's specialty. Even so, ten textile firms qualified for the 1920s list, including seven arrivals. Gotham, Triumph, and Apex all shared in the full-fashioned silk hosiery boom that enlivened the knitting business, while Viscose had become a leading creator of synthetic rayon yarns that fed a related vogue in woven goods. The shift in the furniture trades toward fancy cotton upholstered seating (from wool mohairs and leather) brought rich returns for Collins and Aikman and yarn supplier Aberfoyle, which also provided fine counts for lace makers. At Norristown, Lees played a role comparable to the city-based Fleisher mills in filling a segment of national demand for fine worsted suiting yarns.²² Thus did turnover at the top in textiles mirror the industry's wider trends, in which technical innovation and materials substitution drove older and less adroit companies to the wall and afforded fresh openings to accumulation for firms capable of aggressive adaptation.

Seven of the 1902-06 top ten industrials reappear in Table 3, yet four of them dropped well down in the standings. At Disston Saw, employment had fallen a third, while in steel both Midvale and Phoenix had made even more drastic cuts. Midvale's shrinkage is understandable in a period of slack military and shipbuilding demand, but the Phoenix slide, given its orientation to structural shapes, is puzzling during one of the nation's great high-rise construction surges. The fourth, Brill, had expanded its work force about 15 percent, but lost rank due to the greater gains of other firms. The American wave of street railway system-building had ended, but equipment replacement and Brill's international connections sustained it through the Depression. This cluster represented sectors whose growth surges had largely come in the decades after 1880, whereas the new arrivals, both overall and in the top ten, figured heavily in more recent phases of the Second Industrial Revolution.

The chemical, electrical, and automotive industries reinforced the momentum initiated by metals and machinery manufacturing in the late nineteenth century, and their regional penetration was substantial by the 1920s. Not only did Atlantic Refining soar from twenty-third

²² Scranton, *Figured Tapestry*, passim.

to fourth place, it was joined by two other petroleum processors and Du Pont's expansion of the old Harrison paint works, exemplifying the force of chemical expertise in manufacturing. Moreover, Victor Talking Machine burst from forty-ninth place to third, carrying the flag of electrical engineering and the new consumerism. It too was joined by national newcomers (General Electric and Westinghouse) and local initiatives (Atwater Kent and Electric Storage Battery) to build five sectoral representatives into the hierarchy of the region's top fifteen employers. Further, the Budd Company's service as a maker of body panels and other components for Detroit auto corporations brought it to prominence. Finally, the area's swelling population and the extension of roads for rapid delivery favored the expansion of food processors. Campbell entered the top ten on the strength of a national restructuring of marketing, while three bakeries and one confectionery firm stretched similarly toward spatially-extended sales opportunities.²³

Unlike the situation at the turn of the century, however, these large enterprises were not simply the biggest members of a sectoral cohort, rising above a host of smaller colleagues, as in textiles, cigars, apparel, or machine and foundry work. Nor were they necessarily implicated in a network of midsize specialists and contractors, as in ships and tools or textiles. Instead, this group's executives and managers embraced the twin imperatives of minimum efficient scale and integration that came to be watchwords in continuous flow and mass assembly trades. The former entailed starting with capital-intensive and huge facilities to achieve economies of scale and standardization. The latter implied a *volte-face* from Philadelphia's old networks of contracting and market exchange, installing a preference for bringing inside the company all segments of the production sequence. Where Fleisher stood at the apex of scores of spinning mills, some as small as two dozen employees, there were no forty-man refineries. This in turn suggests that, as the century proceeded, the region's largest firms become gradually less representative of the aggregate, though perhaps more reflective of national patterns.

By 1927-28 the top fifty cohort was substantially transformed. Almost half its members (24) were bulk or mass producers, employing

²³ Susan Strasser, *Satisfaction Guaranteed* (New York, 1989); Richard Tedlow, *New and Improved* (New York, 1990).

45 percent of big plant work forces. The regime of skill and versatility remained central to the activity of thousands of smaller companies, but it was no longer as visibly dominant. Mean employment among the group reached 2,411, and the median had doubled to 1,609 since the turn of the century. Philadelphia's centrality as a site for major employers was eroding; 10 percent fewer big company operatives now labored inside the metropolitan core, even though the raw number of its top fifty firms hardly altered. This in turn indicated that outlying majors had experienced a faster pace of expansion. Indeed, suburban leaders more than doubled in mean size (2,678 vs. 1,328) while the city average had risen but 43 percent (2,154 vs. 1,506). Equally significant, the group as a whole advanced to a 32 percent share of all regional industrial jobs. Overall, the first twentieth-century cycle of industrial restructuring had involved the pursuit of both versatility and scale advantages, aggregating for the largest firms a substantially increased portion of total employment. Would the impact of depression further this concentration? How would clusters of versatile specialists and standard or staple goods makers fare respectively?

Review of the regional leaders in 1934-35 (Tables 5 and 6) makes possible some preliminary responses. First, though the top fifty held their own with 31 percent of area manufacturing employment, the crisis did not promote a second round of aggrandizement. On the whole, job loss was about as severe inside the elite as outside; indeed, at later benchmark points, the leading enterprises never surpassed a one-third share of job control.²⁴ As always, in moving from groups to individual cases there are wide divergences in performance. If, on average, regional manufacturers shed about 20 percent of their workers between 1927-28 and 1934-35, representing an upturn from the 1932 trough, even among the largest firms the Depression had sharply different consequences.

For example, nine of the nineteen "originals" from 1902-06 that were still among the late 1920s leaders fell off the chart by the mid-1930s, four of them textile mills. Fleisher yarn liquidated in bankruptcy after a failed effort at restructuring, and Welsbach wound down its operations, reeling from the shrinking demand for its cotton

²⁴ It must here be allowed that were wartime employment figures at the firm level available for 1918 and 1944, one might well discover a higher, short-term share.

mantles for gas lighting. Aberle hosiery, after bitter labor conflicts, entered a slump that it could not reverse, but the several Bromley lace mills consolidated to endure through the subsequent six decades as an appreciably smaller concern. In steel, Midvale and Bethlehem (Worth) cut staffs radically, struggling with the flaccid demand for their specialties (which would revive after 1938), but Kirschbaum, Brill, and the Laird, Schober shoe company were playing out a losing hand. Unlike the steel plants, none of the three would return to the top fifty, shrinking cyclically after World War II until they shut their doors.²⁵ At all these operations, work force reductions outpaced the regional average.

Among persisters, i.e. companies present in Tables 3 and 5, there were comparable stories of distress. At the extreme, both Collins and Aikman and General Electric's area plants dismissed over 60 percent of their work forces, but in sharply different sectoral contexts. In the upholstery trades, efforts at labor-management collaboration to reduce costs and meet the expansion of southern household fabric mills (many located adjacent to the burgeoning North Carolina furniture centers) failed to stanch the hemorrhage of jobs and profits. Collins and Aikman determined to restructure spatially, starting new mills far from the once-central Philadelphia upholstery districts and permanently removing the places for skilled labor that had seemed so solid a decade earlier. GE's South Philadelphia plant, by contrast, was enduring a severe cyclical crisis of demand for heavy electrical equipment, for all capital goods sectors suffered disproportionately during the long slump. GE was patient, though its workers had to scramble for survival. By decade's end, callbacks gave way to new hires and, into the 1950s, employment mounted to double the 1920s level and five times that of the 1930s.²⁶

Less staggering, but still well above the regional mean, work forces at Aberfoyle yarns, Campbell Soup, and Whitman chocolate slid a third or more by 1934-35. Here again different sectoral forces were at work. Aberfoyle's demand was derived in considerable part from the health of regional cotton yarn-using firms. As upholstery was

²⁵ See firm level employment entries, *Ninth through Seventeenth Industrial Directories of Pennsylvania* (Harrisburg, 1938-1965).

²⁶ Scranton, *Figured Tapestry*. For GE's 1950s employment, see Table 7.

prostrate and lace running slack, with southern yarn mills eager for such contracts as could be had at almost any price, its current and longer-term prospects were unpleasant, to say the least. The two "food groups," like GE, faced present, but not necessarily future, miseries. In depression, mass consumption of prepared soups was bound to flag as households rediscovered the virtues of home-canning, and purchases of Whitman's Samplers similarly faded once every dollar was more closely counted among the middle class. Both firms would rebound, Campbell's stunningly, once the long downturn ended.

A number of top fifty companies closely matched the regional mean, as might be expected. For example, Budd's linkage to Detroit's fortunes and efforts to develop passenger railway car capacities kept its employment close to the average. More interesting were those great firms that experienced few obvious difficulties or actually expanded as others were slipping. Both Atlantic and Vacuum in oil refining showed roughly stable employment in Tables 3 and 5, a clear reflection of the fact that though Americans bought far fewer cars, they drove the ones they owned nearly as much as ever. In silk hosiery, Gotham's work force held stable and Apex's employment advanced some 25 percent, testimony to these firms' ability to match efficiency and style "points" to the pattern of market price declines. More impressive by far was the blossoming of work openings at RCA Victor and Philco (formerly Philadelphia Storage Battery), the product of a double effect from radio's having seized consumers' imaginations. Philco exploded from about 1,500 to over 5,000 workers in seven years, and Victor added 41 percent to its plant complement. Philco's relatively cheap table sets hit a price-conscious market perfectly, and the provision of network broadcasts of popular and classical music boomed both RCA's sales of records and players, even as other purchases were foregone by straitened buyers. As Avner Offer has noted, the rate of radio's adoption was far more rapid than that of autos or telephones, a phenomenon that boosted both Philco and RCA, but in tight money the same circumstances proved disastrous for Atwater Kent. The latter's expensive floor and table models were increasingly shunned as Philco's cheap substitutes proliferated, leading to Kent's appalling 60 percent employment decline, 1927-34, and presaging its eventual closure.²⁷

²⁷ Patricia Cooper, "The Faces of Gender: Sex Segregation and Work Relations at Philco, 1928-1938," in Ava Baron, ed., *Work Engendered* (Ithaca, 1991); Avner Offer, "Gratification

At the regional level, the real erosion of the central city as a favored location for large firms (Table 6) stands out. Indeed, in 1934-35, Philadelphia's share of area industrial employment was eleven percentage points higher than its share of jobs at top fifty firms, suggesting a growing departure by the largest companies from their older pattern of reliance on central locations.²⁸ Smaller enterprises remained a powerful component of city manufacturing, but were far less significant in the suburbs. Evidently, developments in textiles²⁹ extended into other industries. In regional textile production after World War I, the sector's suburban section had a scale distribution skewed strongly toward large firms, while in the city, companies with from five to five hundred workers provided the bulk of employment. Comparably, in mid-depression, twenty-one outlying firms among the top fifty covered 40 percent of all suburban manufacturing positions, whereas the other twenty-nine Philadelphia operations accounted for but 26 percent of factory places at the center. The suburban surge was led by RCA's depression-defying performance, actually a twin-cities phenomenon that gave New Jersey big firms their highest share of top fifty employment at any of the six measurement points documented here. A fuller suburbanization of production, in the small town or greenbelt sense, had not yet materialized.

Among the "new faces" in the 1927-28 roster, seven fell below the lower 1934-35 cutoff line, all but one of which had stood near the foot of the earlier ranking (places 40 or lower). One was a hosiery mill, two others cigar makers, all squeezed by harsher competition or eroding product demand. Only one of these discards (Nabisco) would return to the leading group, like Campbell and Whitman buoyed by consumers' return to purchasing crackers and cookies rather than making their own or abstaining. New arrivals in the 1934-35 leading group were more temporally than sectorally significant. The Bromleys had started a hosiery mill that was solidly capitalized from the family fortunes and successful until the threat of unionization led to an improvident relocation of investment to Tennessee. Another oil refiner

and Prudence," paper presented to the Center for Historical Analysis, Rutgers University, 1991.

²⁸ McLaughlin, *Growth*, 129.

²⁹ Scranton, *Figured Tapestry*, Table 7.1.

and a Ford parts plant, a post-Prohibition distiller and several pipe and box makers also surfaced, suggesting the increasing significance of flow and standard goods to enterprises at the largest scale. With the spectacular decline of Baldwin, from 7,500 to less than 1,000 workers, it is hardly speculative to assert that firms making relatively staple goods were holding their ground better than those committed to specialty, batch, or custom production.

Companies devoted to such versatile and skilled-labor-intensive manufacturing in 1934-35 sustained only one quarter of top fifty employment, even though they constituted nearly 40 percent of the leading firms.³⁰ Though hundreds, even thousands, of specialists continued to be active in batch trades, the region's largest enterprises more and more fit the model of business modernism: organized for bulk outputs within a national production network, if not actually branch plants or subsidiaries of its principal institutions. If any single company's course signals this shift, it is Baldwin, which slid from absolute leadership at the turn of the century to fortieth place in the 1930s and was embroiled in a bitter bankruptcy battle that lasted through much of the decade.³¹

By the late 1930s, what "big business" meant in the Philadelphia region had undergone a serious recoding, one broadly consistent with the national reshaping of manufacturing. Electrical firms had overtaken heavy equipment providers as the most dynamic group. Petroleum refining and automotive parts production overshadowed textiles and apparel. Nearly a quarter of the area's largest employers represented non-local, multi-plant corporations.³² Even so, as the region

³⁰ The remaining batch specialists, in Table 5, are firms numbered 5, 8, 16, 19, 20, 23, 24, 25, 28, 29, 34, 37, 38, 40, 42, 43, 44, 48, and 50. Note that three-fifths of them are in the second twenty-five of the roster.

³¹ National Archives, Mid-Atlantic Region, Record Group 21, Records of the U.S. District Courts, Bankruptcy Case Files, "Baldwin Locomotive Company."

³² Documentation of this pattern may be had by comparing Tables 1, 3, and 5 with Appendices A.1 and A.2 in Chandler, *Scale and Scope*. When the firms on Table 1 are checked against Chandler's 1917 group of the nation's 200 largest firms, seven regional companies appear, ranging in rank from Midvale (no. 6, \$270 million in assets) to Victor Talking Machine (no. 143, \$33 million). Six of these were local firms, including New York Ship which, though headquartered in New York, had its only production facility in Camden. When the later pair of top fifty tables are linked with comparable sets of America's top 200 companies, 17 of the 65 firms there can be connected, but only 5 of these were locally owned. The rest were branches of nationally based operations, chiefly in food, auto, tobacco, electrical, and petroleum. Nine of twelve "nationals" had assets greater than the highest-ranked, locally

moved toward the war decade, the city, if not the suburban counties, still showed the imprint of its history of skilled labor, productive versatility, and local entrepreneurship. Three-quarters of Philadelphia's industrial workers plied their crafts in small and midsize companies, ranging from a handful to six or seven hundred employees. Few of these were externally owned; many focused on skill-demanding specialties: machinery, styled knitwear, industrial and medical instruments, or technical publications. After the war, this would change.

As in other American industrial centers, the demand surge that filled order books and shop floors arrived well before December 7, 1941. In the first year following the Nazi invasion of Poland, Philadelphia manufacturers increased their durable goods production by a third, though payrolls rose only 12 percent, suggesting the initial ending of "short hours" work before new hiring accelerated. Defense-related contracts topped \$1 billion as the United States geared up for combat, triggering the reopening of shipyards for Lend-Lease construction and multiple shifts in production lines among the region's largest companies. Baldwin, extending its World War I capacities, made "guns, tanks, shell forgings, armor plate, propellers, and diesel engines," while Philco focused on bombsights, Budd on aircraft components and munitions, and Brill on gun carriages. By 1944, industrial employment neared half a million and many workers experienced the exhaustion and fattened pay envelopes of mandatory 48-hour weeks, even as over 200,000 area men and women endured comparable fatigue and different risks in the military.³³

War's end, once the celebrations were over, brought the shocks of canceled contracts, sudden inflation, scrambles for conversion to peacetime outputs, and fierce labor-management conflict that became most heated in extended strikes at GE, Westinghouse, and Baldwin in 1946-47. Scores of textile mills shut down forever, having been saved only temporarily by war contracts from their sector's long-term decay. Cramp's shipyards closed a second time, permanently, while New York Ship found it difficult to extricate itself from its devotion to

controlled company, Atlantic Refining, which not incidentally was a continuous flow, standard product operation.

³³ Weigley, *Philadelphia*, 637, 641-42.

military needs. Baldwin forged ahead, newly merged into the Baldwin-Lima-Hamilton Corporation, but its greatest achievements had been logged decades earlier. Even so, there were brighter signs available for the reading. The region's electrical concerns were poised for a resumption of civilian marketing and the renewal of capital goods demand that followed suburbanization. Its chemical plants had the capacity to plow wartime experience into new product development in plastics, pharmaceuticals, and specialty intermediates; and the expertise of area scientific instrument firms stood ready to address complex measurement and control tasks that the postwar push toward automation would engender. Finally, the ENIAC computer project at the University of Pennsylvania suggested the plausibility of Philadelphia as a future center for high-tech innovation, in essence a state-of-the-art scientific version of its classic pattern of spin-off, newly started firms at the cutting edge of industrial innovation.³⁴

These crossing vectors of restructuring leap forward from Tables 7 and 8, which portray the region's largest firms in 1956, a decade after the transition from hot to cold war. Three observations are noteworthy. Though mean employment at leading companies nearly doubled Depression levels (3,785; median, 2,704), there was no evidence of concentration, as their share of regional manufacturing jobs did not rise appreciably. In slump and prosperity, networks of non-elite firms remained responsible for over two-thirds of industrial employment.³⁵ Second, top fifty firms in the Pennsylvania suburbs had in twenty years nearly doubled their share of the roster's work forces (39 vs. 22 percent), enjoying a buoyancy that extended neither to the central city nor to New Jersey counties, the latter's character as bedroom suburbs becoming gradually apparent. Third, the older specialist trades are steadily diminishing, especially textiles, which were then and thereafter absent at the top and replaced by petroleum refining as the third

³⁴ Scranton and Licht, *Work Sights*, 257-65; Scranton, *Figured Tapestry*, 496-99; Weigley, *Philadelphia*, 640-41.

³⁵ This conclusion could be more thoroughly refined through sampling of industrial directories to assess whether there were shifts in the distribution of firm sizes by employment across these two decades. For a later and partial view, based on 1977 and 1987 data concerning thirty-one regional "growth" subsectors, see Table 3.5 in William Stull and Janice Madden, *Post-Industrial Philadelphia* (Philadelphia, 1990).

largest cluster among the leaders, after electrical and transportation equipment.

If Table 7 is compared with its 1930s counterpart, turnover among the regional giants is fully as decisive as that which occurred between the century's first and third decades. The number of persisters from 1902-06 slims to ten; five of these were once among the top eight, but in 1956 only New York Ship remained there, as Baldwin, Disston, Midvale, and Stetson failed to thrive in the postwar atmosphere. On the other hand, a dozen of the thirty-one firms that first reached prominence by the late 1920s held their status, including five of the ten largest (Philco, Budd, Westinghouse, Curtis, and GE), indicating the power of electrical, auto, and publishing developments, but another dozen slumped off the roster, half of them textile firms. The fifteen new faces in 1934-35 fared worse, with only four repeaters in the mid-fifties, none higher than thirty-first in the rankings. Some offered more stable employment in depression than firms that cut back sharply, yet failed to possess the resources to increase their scale over the ensuing decades. Only one of the New Deal era entrants would ever break into the top ten: Merck, Sharpe and Dohme, in 1980, at an employment level (3,500) below the top fifty average a generation earlier.

The twenty-four newcomers in 1956 reflected the sectoral reshuffling that appeared likely to offset the decay of older crafts. Like the 1930s additions, they divided about evenly between locally grown successes and branch plantations of national corporations. In basic metals, rising sales brought Conshohocken's durable Alan Wood plant onto the roster, whereas fresh investment at its Fairless Works made U.S. Steel's new facility a major regional institution. Three instrumentation operations, all originating locally, and two aircraft plants illustrated the momentum of war-propelled new technologies. Yet even in the trades that had inspired the 1920s transition, rising tides yielded other growth poles: in electrical, ITE, Yale and Towne, and Radio Condenser; Heintz in auto parts, Smith-Kline and Rohm and Haas in chemicals, and a Gulf Oil refinery. A third of this double dozen rested among the top twenty employers, and overall the newcomers accounted for a healthy 36 percent of top fifty job opportunities (65,500). Given this prospect of continuing revitalization, the miseries of the fabric, leather, machinery, apparel, and tool trades seemed peripheral annoyances. If the region's old sectoral stalwarts were fading, new champions had surfaced. If the central city's structure of

Table 8
50 Largest Industrial Firms, Philadelphia Region, 1956
Employment by Sector and Location

Sector	Firms			Employment			Total	% of Top 50	% Share Sectoral Emplmt. ^a
	PHL	PA	NJ	PHL	PA	NJ			
Foods	2	0	1	4,882	0	4,500	9,382	5	18
Tobacco	1	0	0	2,704	0	0	2,704	1	n/a
Apparel	2	0	0	3,875	0	0	3,875	2	6
Paper Goods	1	1	0	1,656	2,265	0	3,921	2	18
Printing	4	1	0	12,081	1,077 ^b	0	13,158	8	36
Chemicals	3	2	0	4,869	2,865 ^b	0	7,734	4	21
Petroleum	2	2	1	5,949	5,754	2,650	14,353	8	64
Rubber	0	1	0	0	2,707	0	2,707	1	25
Primary Mtls.	0	3	0	0	13,508	0	13,508	8	34
Fabricated Mtls.	3	3	0	6,274	5,153	0	11,877	7	26
Machinery	2	1	0	4,400	885 ^b	0	5,285	3	12
Electrical	4	2	2	23,433	14,304 ^c	9,285	47,562	26	80
Transport Eqpt.	2	5	1	13,325	20,727	5,530	39,578	20	88
Instruments	2	1	0	6,092	1,533	0	7,625	4	52
Totals	28	17 ^d	5	89,986	70,778	22,505	183,269	99	
Percent of Top 50 Employment	49%	39%	12%						
Top 50 Firms Percent of Total Regional Industrial Employment	32%								

Sources: Summers and Luce, and Table 7.

^aTop 50 firms' share of total regional employment in sector. Data available only for 1956, 1962, and 1980. See Anita Summers and Thomas Luce, *Economic Development in the Philadelphia Metropolitan Area* (Philadelphia, 1987), Table D.3.

^bBranch plant of Philadelphia firm.

^cIncludes 3,735 workers at branch plant of Philadelphia firm.

^dDoes not include 5 branches of Philadelphia firms.

Table 9
50 Largest Industrial Firms, Philadelphia Region, 1962

Name	Loc. Products	Employment	Sector
1. Philco Corp.	PHL Radio/TV Equipment	6,434	36
	PA Electronic Equipment	5,509	
	PA Computing Equipment	<u>1,467</u>	
		13,410	
2. RCA	NJ Radio/TV/Electronics	11,225	36
3. General Electric Co.	PHL Electrical/Electronic Equip.	9,959	36
4. Budd Co.	PHL Motor Vehicle Parts	8,207	37
5. Westinghouse Electric Co.	PA Turbines/Machinery	7,709	36
6. Curtis Publishing Co.	PHL Printing/Periodicals	5,504	27
	PA	<u>1,603</u>	
		7,107	
7. U.S. Steel Corp.	PA Steel Plate & Tube	6,644	33
8. N.Y. Ship	NJ Ships/Repairs	5,805	37
9. Rohm & Haas Co.	PHL Plastics/Resins	5,305	28
10. Lukens Steel Co.	PA Steel Plate, etc.	4,717	33
11. Leeds & Northrup Co.	PHL Instrumentation	2,604	38
	PA	<u>1,458</u>	
		4,162	
12. Triangle Publications	PHL Newspapers/Magazines	4,098	27
13. ITE Circuit Breaker Co.	PHL Electrical Switchgear	4,015	36
14. Campbell Soup Co.	NJ Food Products	4,000 *	20
15. Sun Oil Co.	PA Petroleum Products	3,807	29
16. Standard Pressed Steel Co.	PA Hardware/Rivets	3,188	34
17. Atlantic Refining Co.	PHL Petroleum Products	3,182	29
18. Minn.-Honeywell (Brown)	PHL Instrumentation	3,126	38
19. Sun Shipbuilding Co.	PA Ships/Repairs	3,079	37
20. SKF Industries	PHL Ball/Roller Bearings	2,986	35
21. Alan Wood Steel Co.	PA Steel Plate, etc.	2,899	33
22. Firestone Tire & Rubber	PA Tires/Tubes	2,777	30
23. Scott Paper Co.	PA Paper Products	2,719	26
24. Boeing-Vertol (Piasecki)	PA Helicopters	2,503	37
25. Baldwin-Lima-Hamilton	PA Locomotives/Parts	2,436	37
26. Bulletin Co.	PHL Newspapers	2,311	27
27. H. Daroff & Sons	PHL Men's and Boys' Clothing	2,070	23
28. Merck, Sharp & Dohme	PHL Pharmaceuticals	751	28
	PA	<u>1,167</u>	
		1,918	

Table 9--Continued

29. General Baking Co.	PHL	Food Products	1,865	20
30. Cuneo Eastern Press	PHL	Printing/Periodicals	1,814	27
31. Universal Rundle Corp.	NJ	Plumbing Fixtures	1,800	34
32. Bethlehem Steel Co.	PA	Structural Steel	1,786	34
33. S.F. Whitman & Son	PHL	Candy	1,738	20
34. Mobil Oil Co.	NJ	Petroleum Products	1,698	29
35. Burroughs Corp.	PA	Computing Machines	1,624	36
36. Bayuk Cigars, Inc.	PHL	Cigars	1,610	21
37. American Viscose Corp.	PA	Plastics/Resins	1,605	28
38. Remington Rand-Univac	PA	Computing Machines	1,591	36
39. Amer. Machine & Metals	PA	Instrumentation	1,550	38
40. Link-Belt Co.	PHL	Power Transmission Equip.	904	35
	PA		<u>626</u>	
			1,530	
41. Container Corp. of America	PHL	Paperboard/Boxes	1,518	26
42. Gulf Oil Corp.	PHL	Petroleum Products	1,503	29
43. Midvale-Heppenstall Co.	PHL	Steel Forgings, etc.	1,456	34
44. Stanley Flagg & Co.	PA	Valves/Fittings	1,379	34
45. Sinclair Refining Co.	PA	Petroleum Products	1,347	29
46. National Dairy Products	PHL	Food Products	1,292	20
47. Sun Clothes	PHL	Women's Outerwear	1,290	23
48. Kelsey-Hayes (Heintz)	PHL	Motor Vehicle Parts	1,279	37
49. Tasty Baking Co.	PHL	Food Products	1,254	20
50. R.D. Wood Co.	NJ	Hydraulic Machinery	1,250	35

*estimated

Sources: *Sixteenth Industrial Directory of Pennsylvania* (Harrisburg, 1962);
Industrial Directory of New Jersey for 1962 (Trenton, 1963).

Table 10
50 Largest Industrial Firms, Philadelphia Region, 1962
Employment by Sector and Location

Sector	Firms			Employment			Total	% of Top 50	% Share Sectoral Emplmt. ^a
	PHL	PA	NJ	PHL	PA	NJ			
Foods	4	0	1	6,149	0	4,000	10,149	6	21
Tobacco	1	0	0	1,610	0	0	1,610	1	n/a
Apparel	2	0	0	3,360	0	0	3,360	2	6
Paper Goods	1	1	0	1,518	2,719	0	4,237	3	18
Printing	4	1	0	13,727	1,603 ^b	0	15,330	9	41
Chemicals	2	2	0	6,056	2,772 ^c	0	8,828	5	22
Petroleum	2	2	1	4,685	5,154	1,698	11,537	7	64
Rubber	0	1	0	0	2,777	0	2,777	2	22
Primary Mtls.	0	3	0	0	14,260	0	14,260	8	41
Fabricated Mtls.	1	3	1	1,456	6,353	1,800	9,609	6	23
Machinery	2	1	1	3,890	626 ^b	1,250	5,766	3	12
Electrical	3	4	1	20,408	17,924 ^c	11,225	49,551	29	67
Transport Eqpt.	2	3	1	9,486	8,018	5,805	23,309	14	94
Instruments	2	2	0	5,730	3,008 ^c	0	8,738	5	59
Totals	26	18 ^f	6	78,075	65,214	25,778	169,062	100	
Percent of Top 50 Employment				46%	39%	15%			

Top 50 Firms Percent of Total Regional Industrial Employment 31%

Sources: Summers and Luce, and Table 9.

^aTop 50 firms' share of total regional employment in sector. Data available only for 1956, 1962, and 1980. See Anita Summers and Thomas Luce, *Economic Development in the Philadelphia Metropolitan Area* (Philadelphia, 1987), Table D.3.

^bBranch plant of Philadelphia firm.

^cIncludes 1,167 workers at branch plant of Philadelphia firm.

^dIncludes 6,996 workers at branches of Philadelphia firms.

^eIncludes 1,458 workers at branch of Philadelphia firm.

^fPlus 5 branches of Philadelphia firms.

interlaced middling and small sized firms did endure, the power of its suburban successors seemed undeniable. The city that had been the "Arsenal of America" in wartime was steadily being transformed into a regional complex of continuing significance, as might be expected from the nation's most flexible production system.³⁶

Yet something went wrong, profoundly. Six years after the flexing of industrial muscle that the 1956 roster featured, top fifty employment was off 12 percent, a troubling portent visible in Tables 9 and 10. Even though forty-one firms from the previous list reappeared, for the first time a majority of the region's biggest enterprises stemmed from national rather than local ownership (27 vs. 23). Disston and Stetson, two more of the hardy originals, had faltered, and Ford, which reduced its Chester plant's operations, slid as well, signaling the final decline of that once-vigorous industrial satellite. Kaiser had ended its area aircraft involvement; only Boeing-Vertol would sustain the dwindling eastern states' presence in this sector's increasingly far west production orientation. Regional cheerleaders might well celebrate the advance of Burroughs and Univac, and related, sizable information-centered firms, but it was plain that the leaders were not expanding to take up the slack that continuing decay of older trades left behind.

Even as sectoral diversity among the top fifty continued, with fourteen of the twenty possible census divisions present, a closer look at the two most prominent trades should have sent a shiver through the regional nervous system. In transportation and electrical equipment, which contributed over 80,000 jobs among top fifty firms both in 1956 and 1962, employment was critically dependent on a very small group of companies. The concentration ratios (right edge columns in Tables 8 and 10) for these sectors were the highest in the region, and corporate decisions about future investment were being taken by non-local headquarters assessing competitive conditions at the national, and increasingly, global plane. Such decisions, including those by refiners, the third most concentrated sector, would have far more impact on regional industrial capacity than those by locally centered corporations in printing, metal fabricating, or chemicals. In these three key industries, in which the bulk of jobs were dependent

³⁶ Weigley, *Philadelphia*, 637.

on a small cadre of enterprises, initiatives to downsize or vacate plants would leave their workers with perilously few options for alternative employment. Though only detailed research on the region's postwar manufacturing system can fully document the processes involved, at this point it appears that a double dynamic was operative in the slowly building crisis of regional industrialism. The area's classic job generators in the specialty and flexible trades underwent an extended sequence of liquidations, concentrated in the central city, as their versatile capacities were devalued in an economy driven more than ever by price competition and standardized outputs. Niche outposts of the old system did survive among firms in instrumentation, textile dyeing, or printing and publishing, but the momentum these sectors provoked and enjoyed through the 1920s was lost irrevocably. At the same time, the growing prevalence of nationally-constituted corporations in the region's second and third waves of industrial development left Philadelphia and its surrounding counties held hostage to market (and political) shifts over which local actors had no control whatsoever. Pork barreling might preserve the Frankford Arsenal (for a time) and the Navy Yard (until recently), but in the private sector, harsher realities governed. Regional plants of major corporations, it seems, were judged both against cost-profiles of rival American regions and international sites *and* against technological and market opportunities—and found wanting on either or both counts. In consequence, new investment was placed elsewhere and regional capacities wound down toward closure.

The 1980 compilation of large firms (Tables 11 and 12) suggests the effects of such a process. Philco, the region's largest employer less than twenty years previously, was in the throes of liquidation after an ineffective merger with Ford. GE, Westinghouse, and RCA had halved their work forces, Baldwin had vanished, as had New York Ship. Some 46,000 positions in transportation and electrical equipment disappeared among the top fifty firms, accounting for 85 percent of the cohort's drastic contraction. The top three firms' work force share had slumped to 16 percent of the leaders' employment, the lowest in the century, and the top fifty group's proportion of all jobs dipped similarly to 26 percent, barely above the turn-of-the-century level. However, unlike that era, midsize and small firms were themselves filling the lifeboats, rather than building new avenues for productive advance. In apparel, printing, and textiles, the later 1960s and 1970s

had been a walking disaster. Among the big operations depicted in the tables, mean employment had slumped to 2,300 (median, 1,600) and twenty-six of those on the 1962 list had been replaced by appreciably smaller companies. Only three of the 1902-06 leaders reappeared: Baldwin, RCA/Victor, and Midvale, the last of which would shortly fall into bankruptcy. Several "high tech" firms surfaced or reappeared: in pharmaceuticals, Smith-Kline, Betz, McNeil, and Wyeth; in electronics, EMS, American Electronic, Jerrold, and Ametek. These took their places alongside major national enterprises that represented the post-war deepening of initiatives from the 1920s (RCA, Westinghouse, Rohm and Haas, GE, Firestone, Goodrich and Lee tires), as well as the flourishing of information and control systems (Leeds and Northrup, Burroughs, Sperry-Univac, and Honeywell, which had absorbed Brown Instruments).

On the surface, it might appear that the regional industrial complement had undergone a second thorough revitalization, comparable to that of the 1920s, but there were four soft spots in the new situation. As a half-century earlier, the largest proportion of new wave leaders were elements in continent-wide or international corporations. The region was a manufacturing site-of-convenience, and the continuation of operations at local plants depended on financial, market, technical, and governmental factors far beyond the control of regional managers, bankers, or politicians. Indeed, the most heralded, locally originated success, Milton Shapp's Jerrold Electronics, failed to thrive as cable television surged. Second, as with the 1920s arrivals, few of these operations relied on extensive contracting networks of the sort common at the turn of the century in "traditional" sectors. They were chiefly free-standing enterprises, rather than peak companies drawing on diverse expertise lodged in smaller specialty firms, and thus their growth did not trigger regional multiplier effects that the earlier system featured. Firms concerned with control over proprietary information, focused on internalizing research and development, and fearing the effects of shortened product life cycles were, it seems, far less willing to "outsource" and take the risks of leakage or poor quality control that contracting implied.³⁷

³⁷ On this issue more generally, and for contrasts with strategies outside the United States, see Ira Magaziner and Mark Patinkin, *The Silent War* (New York, 1989).

Table 11^a
50 Largest Industrial Firms, Philadelphia Region, 1980

Name	Loc.	Products	Employment	Sector
1. U.S. Steel Co.	PA	Steel Plate/Tube	8,500	33
2. RCA	NJ	Electronics/TV	6,900	36
3. Campbell Soup & Pepperidge Farm	NJ PA	Food Products	3,500* <u>1,500</u> 5,000	20
4. Westinghouse Electric Co.	PA	Turbines	5,000	36
5. Rohm & Haas Co.	PHL PA	Plastics/Resins	2,750* <u>1,775</u> 4,525	28
6. Sun Shipbuilding	PA	Ships/Steel Fabrication	4,000	37
7. Boeing Vertol Co.	PA	Aircraft/Parts	4,000	37
8. Burroughs Corp.	PA	Electronic Systems	3,857	36
9. Leeds & Northrup Co.	PA	Instruments/EDP ^b	3,500	38
10. Merck, Sharp & Dohme	PA	Pharmaceuticals	3,500	28
11. Sperry-Univac	PA	Digital Computers	3,100	36
12. Smith-Kline Corp.	PHL	Pharmaceuticals	3,000	28
13. Franklin Mint Co.	PA	Medals/Specialties	2,945	39
14. Scott Paper Co.	PA	Paper/Plastic Goods	2,900	26
15. General Electric Co.	PHL	Electrical Controls	2,700	36
16. Firestone Tire & Rubber	PA	Tires/Plastics	2,550	30
17. Botany "500" (Daroff)	PHL	Men's and Boys' Clothing	2,500	23
18. Triangle Publications	PA PHL	Magazines	1,200 <u>1,100</u> 2,100	27
19. Honeywell, Inc.	PA	Instrumentation	2,080	38
20. Bulletin Co.	PHL	Newspapers	2,000	27
21. Sun Co.	PA	Oil/Chemical Products	1,800	29
22. Tasty Baking Co.	PHL	Food Products	1,741	20
23. CBS Records	NJ	Phonograph Records	1,700	36
24. Ford AeroComm Corp.	PA	Electronic Auto Products	1,700	37
25. B.F. Goodrich Tire Co.	PA	Tires	1,600	30
26. Ship'N'Shore	PA	Women's Clothing	1,521	23
27. Ametek/A. Mach. & Metal	PA	Instrumentation	1,500	38
28. Chilton Co.	PA	Publishing	1,500	27
29. Teleflex, Inc.	PA	Industrial Controls	1,456	35
30. Wyeth Laboratories	PA	Pharmaceuticals	1,430	28
31. Foote Mineral Co.	PA	Alloys/Ground Ores	1,400	33
32. Amer. Electronic Labs.	PA	Comm./Electronics	1,400	36

Table 11--Continued

33. Progress Lighting	PHL	Electric Fixtures	1,400	34
34. Mobil Oil Corp.	NJ	Petroleum Products	1,387	29
35. Philadelphia Gear Corp.	PA	Power System Products	1,383	35
36. Nabisco, Inc.	PHL	Food Products	1,300	20
37. Eaton Corp.	PHL	Industrial Vehicles	1,300	37
38. C-E Glass	NJ	Safety Glass	1,260	32
39. EMS, Inc.	PA	Medical Technology	1,256	38
40. Abbott's Dairies	PHL	Food Products	1,200	20
41. Standard Pressed Steel	PA	Industrial Fasteners	1,160	34
42. Owens-Corning	NJ	Fiberglass Products	1,151	32
43. Betz Laboratories	PA	Specialty Chemicals	1,150	28
44. Lee Tire & Rubber	PA	Tires	1,150	30
45. Dana Corp.	PA	Steering/Propellers	1,100	34
46. Beech-Nut Foods	PA	Baby Foods	1,099	20
47. McNeil Laboratories	PA	Pharmaceuticals	1,058	28
48. Midvale-Heppenstall	PHL	Steel Forgings	1,050	34
49. SGL Industries	NJ	Electronic Technology	1,029	36
50. Jerrold Electronics	PA	Cable TV Systems Equip.	1,012	36

*estimated

Sources: *Pennsylvania State Industrial Directory for 1980* (New York, 1980); *New Jersey State Industrial Directory for 1980* (New York, 1980).

^a Several large firms (ESB Ray-O-Vac, Crown Cork & Seal, SKF) provided the directories only with total national employment figures, from which regional work forces could not be separated. This clearly limits the utility of the 1980 roster.

^b Electronic data processing equipment.

Table 12
50 Largest Industrial Firms, Philadelphia Region, 1980
Employment by Sector and Location

Sector	Firms			Employment			Total	% of Top 50	% Share Sectoral Emplmt. ^a
	PHL	PA	NJ	PHL	PA	NJ			
Foods	3	2	1	4,241	2,599 ^b	3,500	10,340	9	28
Apparel	1	1	0	2,500	1,521	0	4,021	3	13
Paper Goods	0	1	0	0	2,900	0	2,900	3	15
Printing	1	2	0	3,100	2,700 ^c	0	5,800	5	38
Chemicals	2	4	0	5,750	8,913 ^d	0	14,663	13	40
Petroleum	0	1	1	0	1,800	1,387	3,187	3	27
Rubber	0	3	0	0	5,350	0	5,350	5	58
Glass	0	0	2	0	0	2,411	2,411	2	17
Primary Mtls.	0	2	0	0	9,900	0	9,900	9	41
Fabricated Mtls.	2	2	0	2,450	2,260	0	4,710	4	12
Machinery	0	2	0	0	2,839	0	2,839	2	6
Electrical	1	5	3	2,700	14,369	9,629	26,698	23	63
Transport Eqpt.	1	3	0	1,300	9,700	0	11,000	10	41
Instruments	0	4	0	0	8,336	0	8,336	7	38
Miscellaneous	0	1	0	0	2,945	0	2,945	3	30
Totals	11	33	7	22,041	76,132	16,927	115,100	101	
Percent of Top 50 Employment	19%	66%	15%						

Top 50 Firms Percent of Total Regional Industrial Employment 26%

Sources: Summers and Luce, and Table 11.

^aTop 50 firms' share of total regional employment in sector. Data available only for 1956, 1962, and 1980. See Anita Summers and Thomas Luce, *Economic Development in the Philadelphia Metropolitan Area* (Philadelphia, 1987), Table D.3.

^bIncludes 1,500 workers at subsidiary of New Jersey firm.

^cPhiladelphia figures include 1,100 workers at subsidiary of a suburban firm.

^dIncludes 1,775 workers at a branch of a Philadelphia firm.

Table 13
Industrial Employers Among Top 50 Employers, 1990

Rank	Name	Products	Area Empl.	Nat'l Empl.	A/N (%)
5.	Unisys Corp.	Computers	7,000	N/A	-
6.	Sun Co.	Oil Products	5,020	N/A	-
7.	Rohm & Haas	Chemicals	5,002	13,000	38
11.	Campbell Soup	Foods	3,050	N/A	-
12.	Scott Paper	Paper Goods	3,000	40,000	8
13.	Lukens, Inc.	Steel	2,470	3,800	65
19.	SPS Technologies	Fasteners	1,774	5,900	30
22.	Amatek, Inc.	Instrumentation	1,400	5,800	24
23.	CSS Industries	Paper Goods	1,400	1,400	100
26.	Tasty Baking Co.	Foods	1,200	1,200	100
27.	Arco Chemical	Petrochemicals	1,200	3,580	33
35.	Fischer & Porter	Instrumentation	1,000	2,600	38
36.	Betz Laboratories	Special Chemicals	975	3,400	29
37.	Moore Products	Instrumentation	950	1,050	90
40.	Penn Engineering	Fasteners	660	840	79
45.	S. Jersey Industries	Apparel	633	633	100
48.	Crown Cork & Seal	Fabricated Metal Goods	600	14,700	4

Source: *Philadelphia Inquirer*, May 15, 1990, Section E: "The Inquirer 100."
 Top 50 Employers include all private sector firms in the SMSA's industrial, service, and utilities sectors. Total employment for all 50: 122,579; industrial employment among top 50: 37,334 (30%).

In addition, the newer technologies used by these firms generated relatively fewer production jobs than had their predecessors. Both Burroughs's suburban Paoli center and a large portion of GE's Philadelphia facilities were defense-related research and development operations with high levels of white-collar employment. Other increasingly capital-intensive and process-oriented "third wave" leaders needed far fewer operatives per unit of output than did Dobson or Cramp's or, for that matter, Philco in the 1930s. Finally, and related, an enormously successful company would no longer, like New York Ship, simply expand in place to the limits of market demand and regional labor supply, but instead, like Collins and Aikman, would spin off clones of its production facilities elsewhere in the United States or abroad. Hence, for both technological and strategic reasons, the advance of new sectors into regional leadership had profoundly limited potential to sustain 1950s levels of industrial employment.

Spatially within the region, the post-1962 reshuffling of big firms illustrates the declining magnetism of Philadelphia's older manufacturing neighborhoods and newer "greenbelt" sites in the far northeast and southwest wards (Table 12). For the first time in the century, the city held fewer than half of the area's largest plants, only eleven vs. twenty-six in 1962. Together the core city leaders employed but 18 percent of the cohort's workers, vs. 46 percent in Mayor James Tate's days, whereas operations in the Pennsylvania suburbs hosted two-thirds of jobs remaining at top fifty corporations in 1980. However, as in the pre-war decades, the shares and shifts among the region's three segments look somewhat different when figures for the largest firms are contrasted with those for total industrial employment. In Camden and the New Jersey surround, the two categories conform closely: top fifty shares in 1956-62-80 of 12, 15, and 15 percent, and total regional employment shares for 1951-59-80, 11, 14, and 15 percent. There is, by contrast, substantial divergence when Philadelphia and the Pennsylvania suburbs are similarly considered. The city reported 49, 46, and 18 percent of top fifty workers at the three dates displayed in Tables 8, 10, and 12, but a significantly larger 62, 55, and 32 percent of metropolitan manufacturing employees in 1951-59-80. These differentials strongly suggest that midsize and small firms continued to operate, if not thrive, in city spaces, most likely in the slowly eroding fabric, clothing, metalworking, and printing sectors. Bucks, Chester, Montgomery, and Delaware Counties exhibit a reversed profile. These

districts showed 39, 39, and 67 percent shares of top fifty jobs at the three dates, but 27, 31, and 53 percents of regional manufacturing positions as their counterparts. Network- and contract-dependent firms or relatively tiny "niche" specialists evidently found the suburbs less appealing than did larger, integrated, and space-devouring plants. The thick pattern of internal connections that built the Delaware River complexes, Spring Garden and Northern Liberties, the Washington or Germantown Avenue corridors, or Manayunk-East Falls would not be reproduced in suburban industrial parks, for the relevant, referent "shell" for innovation, competition, and linkages had expanded from the neighborhood or region to the national or global level, as had its institutional correlates.

The 1980s have confirmed these trends, for such market forces as are active in this nation's unevenly regulated economy have meshed with corporate strategizing to further diminish the Philadelphia region's industrial capacity. Among the top twenty 1980 enterprises, seven have shut down manufacturing facilities in the last decade: U.S. Steel, Westinghouse, Sun Ship, Leeds and Northrup, GE, Botany "500," and the Bulletin Company. RCA sold its Camden facilities to GE, which is reducing its operations bit by bit, and Campbell is likewise shifting away from New Jersey's most bedraggled city. Though Burroughs and Sperry merged into Unisys, the fate of this most important local combine is at risk in recession, for what proportion of its 7,000 jobs (1990) will remain after current cuts is anyone's guess (Table 13). Consistent with strategies noted above, Rohm and Haas, Scott, Campbell, and others now have minor fractions of their total work forces regionally employed, and there is no evidence that trends originating a generation ago will be reversed.³⁸

These rough tabulations of the Philadelphia region's most prominent twentieth-century industrial employers and the accompanying discussion advances our understanding of restructuring and decline in several ways. They highlight a double transition, evident by the 1920s and far advanced by the 1950s: first, the displacement of hallmark batch production firms in sectors from heavy equipment through tex-

³⁸ For a broadly similar assessment, using aggregate and dis-aggregated regional data, see Stull and Madden, *Post-Industrial*, chap. 3.

tiles by enterprises devoted to novel technologies and, with a few exceptions, continuous flow or mass production; second, the shift at the top from locally rooted operations to Philadelphia's role as one among many locales within the internationalizing web of "managerial capitalism." Further, they show outlying sites as increasingly attractive to such incomers and suggest the real vulnerabilities beneath the surface of apparent regional manufacturing vitality in the 1950s and 1960s. These portraits also broaden the empirical base for recent narrative accounts and place recent economic and policy studies in an extended temporal framework.³⁹

Even so, documenting these shifts is only the first step toward providing plausible explanations for them. Tabulations are no substitute for direct accounts of corporate or sectoral histories, of the sort that I undertook for textiles and John Brown and Harry Silcox are completing for Baldwin and Disston, respectively. Tables cannot tell us why a Silicon Valley failed to develop along the Delaware, and they rest mute about the corporate rationalizations that led to abandonment rather than reinvestment in regional plants of national corporations. Here the need is for comparative interregional studies of, for example, this area's thin linkages between university and corporate research and the Department of Defense or National Science Foundation versus those centered around MIT and Stanford, as well as probes into archival documentation of strategic locational and technical decisions taken by distant headquarters staffs.⁴⁰

On another level, care must be taken not to "read off" dynamics of regional industrial change from the courses of leading firms alone. Evidence for the increasing disparity between top fifty and aggregate patterns suggests that, as the century proceeded, our relative ignorance of the workings of middling and small companies becomes a real

³⁹ Anita Summers and Thomas Luce, *Economic Report on the Philadelphia Metropolitan Area: 1985* (Philadelphia, 1985); Summers and Luce, *Economic Development* (see Appendix A.2 for added bibliography); Stull and Madden, *Post-Industrial*; Carolyn Adams, *The Politics of Capital Investment: The Case of Philadelphia* (Albany, 1988).

⁴⁰ Brown is completing his dissertation on Baldwin at the University of Virginia, whereas Silcox's study of Disston will shortly be released by Pennsylvania State University Press. The deposit of an enormous collection of Burroughs archives at the University of Minnesota's Charles Babbage Institute, a sizable section of which deals with the Paoli operation, may open a window on recent corporate strategizing.

limitation. Whereas studies of metalworking and textiles indicated the durable importance of non-elite firms into the 1940s, as does the top fifty's stable share of overall employment, the most recent regional analysis argues that small firms persist as centers of job creation.⁴¹ Historical research on this array of regional firms has, as yet, not moved beyond 1940, and social scientists' inquiries commence with the later 1970s, leaving a generation-long lacuna that only painstaking inquiries can fill.

The third challenge this study highlights is the need to link regional shifts to the larger context of alterations in the structure of incentives and obstacles to industrially based accumulation, nationally and internationally. One concern is to distinguish how sectoral and company growth or decay derives from factors in the market, the firm, or the environment, and in what medley of influences related to managerial and marketing practices, labor relations, organizational forms, finance, technological change, state policies, secular demand and supply shifts, global market integration, or corporate culture and leadership, for that matter. Given this complexity, it is little wonder that historical studies have most often focused on single firms, in which such detail is illuminating, or national aggregates, in which it is suppressed, rather than on regional dynamics for which it can seem overwhelming. Yet it is precisely at the regional level where a productive intersection between case studies and carefully drawn data sets may be expected to generate a manageable profile of industrial development and restructuring. Research on industrialization, like inquiry into other "large processes,"⁴² calls for blending an inclusive vision with a bounded focus. Given the increasing acknowledgment of the salience of regional studies,⁴³ this essay may provide both a focal point and some raw

⁴¹ Scranton, *Figured Tapestry*; Howell Harris, "Little Drops of Water, Little Grains of Sand"; and idem., "Employers' Collective Action in the Open-Shop Era: The Metal Manufacturers' Association of Philadelphia, 1903-33," in Steven Tolliday and Jonathan Zeitlin, eds., *The Power to Manage?* (London, 1991), 117-46. Stull and Madden's *Post-Industrial* reports nearly two-thirds of "growth industry" new jobs (1977-87) originating at firms with fewer than 100 workers (Table 3.6).

⁴² Charles Tilly, *Big Structures, Large Processes and Huge Comparisons* (New York, 1984).

⁴³ John Mollenkopf, *The Contested City* (Princeton, 1985); Edward Soja, *Postmodern Geographies* (London, 1989), chaps. 7-9; Michael Storper and Richard Walker, *The Capitalist Imperative* (Oxford, 1989).

material for interpreting Philadelphia's twentieth-century industrial history, extending a line of provocative research that has explored the origins and trajectories of eighteenth- and nineteenth-century commercial and manufacturing relations.

In closing, let me reaffirm my sense that Philadelphia's regional manufacturing decline was not an inexorable corollary to the rise of big business, the ceaseless search for efficiencies, or the intensification of interregional and international competition. Such lines of explanation naturalize and rationalize a far more diffuse and contingent process whose outcomes were the products of political struggles, contested definitions of efficiency or competition, and guesses about risk and return fully as much as results of market signals or organizational and technical innovations or shortcomings.⁴⁴ Exploring more fully how the world of possibilities represented by the region's industrial prowess in 1900 was transformed into acres of crumbling plants will demand theoretical and explanatory openness as well as an abundance of empirical research.

A Note on Sources

Firm level data for manufacturing cannot be extracted from census schedules between 1880 and 1919, for no original materials have been preserved. Recently, schedules for the biennial censuses at several dates in the 1920s and 1930s have been discovered at the National Archives by a Harvard Business School team headed by Daniel Raff, but public access to them may be governed by confidentiality rules. However from the 1890s, Pennsylvania and New Jersey published factory inspectors' reports giving employment by firm for all enterprises covered by statutes. Starting in 1906 for New Jersey and 1913 in Pennsylvania, state agencies compiled industrial directories which again offer employment data. (For Pennsylvania, these figures first appear in the 1916 volume.) As these sources give neither capitalization nor value-added data, and no others provide them consistently at

⁴⁴ For extended discussions of this non-teleological approach to industrial history, see Sharon Zukin and Paul DiMaggio, eds., *Structures of Capital: The Social Organization of the Economy* (New York, 1990); and Tolliday and Zeitlin, *Power to Manage?*

the firm level, such measures cannot be used. Hence, the state reports and directories were the basic references for this study.

Two complications arose. Only rarely did both states produce directories covering the same year, leading to temporal gaps in the first three sets of tables, the longest being four years. Second, in the 1960s, both states ceased issuing directories, and the task of gathering this valuable information was privatized. Several large regional companies declined to reveal their employment, forcing estimations as noted in the later tables. In working through directories, information on all firms with over 500 workers was gathered at six points, the dates being chosen to conform with guidelines for an international regional restructuring project comparing the United States, United Kingdom, and Japan, to which an earlier draft of this essay contributed. These files were ordered to yield the sets of top fifty companies.⁴⁵ Once the groups were completed, each firm was classified sectorally using standard census categories at the two-digit level (see Sector Classifications). For 1956 and after, U.S. Department of Labor data on two-digit sectoral totals of regional employment enabled calculation of top fifty firms' shares of such jobs. The boundaries of the region are those used by the Census for the Philadelphia Industrial Area (pre-1940) and the later Standard Metropolitan Statistical Area: Philadelphia, Bucks, Chester, Montgomery, and Delaware counties, plus New Jersey's Camden, Burlington, and Gloucester counties.

Rutgers University

PHILIP SCRANTON

⁴⁵ The number of 500+ work forces at each date was: 1902-06, 85; 1927-28, 121; 1934-35, 99; 1956, 138; 1962, 112; 1980, 133. The increase in 1980 may reflect survival and some expansion among midsize suburban plants and relative attrition of the cadre employing 100 to 500 workers. However, as these figures represent "unregulated" reports, they may rightly be viewed with some skepticism.

