

ESSAY REVIEW

Finance, Culture, and Technology: Recent Studies of British and American Industry.

Industrial Finance, 1830-1914: The Finance and Organization of English Manufacturing Industry. By P. C. COTTRELL. (London and New York: Methuen, 1980. xii, 298 p. Tables, bibliography, index. \$40.00.)

Work, Society and Politics: The Culture of the Factory in Later Victorian England. By PATRICK JOYCE. (New Brunswick, N. J.: Rutgers University Press, 1981. xxv, 356 p. Illustrations, maps, tables, appendix, index. \$25.00.)

Transatlantic Industrial Revolution: The Diffusion of Textile Technologies between Britain and America, 1790-1830s. By DAVID JEREMY. (Cambridge, Mass.: The MIT Press, 1981. xvii, 384 p. Illustrations, tables, glossary, bibliography, index. \$32.50.)

Frontiers of Change: Early Industrialism in America. By THOMAS C. COCHRAN. (New York: Oxford University Press, 1981. 179 p. Bibliography, index. \$15.00.)

The rich complexities of industrialization continue to fascinate historians of the nineteenth-century. A revitalization of economic and labor history over the last decade has led to dozens of sharply focused and increasingly sophisticated studies considering the multi-dimensional process that brought global preeminence to Britain and the United States. As a result, biographical and invention-centered older works have been supplemented by a wave of theoretically-informed monographs, often comparative in form, which serve to deepen our understanding of the context and contingencies that accompanied industrial development. Four recent studies in this vein, three specialized investigations and one preliminary synthesis, will be reviewed below. Two of them treat quite different elements of the British experience, factory culture and manufacturing finance, two consider the early American situation, in which Philadelphia and Pennsylvania figured prominently. Together they enhance our appreciation of capitalist development and stimulate a range of questions which might well inform future research.

Finance has little of the romance and verve often to be found in discussions of hardy entrepreneurship or industrial struggles, yet the question of where the money came from, capital for start-up, for operations and for expansion, must be addressed in any reconstitution of the nineteenth-century manufacturing environment. It is one thing to list the sources of funds which fueled industry (private partnerships, public stock-issues, bank loans, etc.) and quite another to specify the relationships whereby capital circulated and their developmental pattern over a century's span. P. C. Cottrell undertakes this daunting task in *Industrial Finance, 1830-1914*. On the whole, he completes it in admirable fashion.

Cottrell divides the nine decades he considers into three periods, the transition points being sparked by Parliamentary alteration of the statutes governing business incorporation, first in the 1850s and again at the turn of the century. The first set of Acts dramatically eased the registration and regulation of limited companies. The second pair (1900, 1907) moderately tightened up the process, in response to speculative abuses, and extended liability protection to private firms (family and partnership firms that did not seek public capital) without elaborate financial disclosure requirements. In addition to this descriptive periodization of industrial capital markets, Cottrell also seeks to assess whether factors in their configuration "retarded" industrial "structural change before 1914," a deficiency which contributed to economic stagnation in the present century.

Focusing on the coal, iron and textile sectors, Cottrell finds that in the first era (1830 to the late 1850s), initial capital was generally drawn from local private sources, formalized in partnerships. The unlimited liability of interested parties served to reassure creditors while encouraging close personal supervision of the works. Not uncommonly in coal, aristocrats exploited their own lands, able singly to fund the sizeable capital investment necessary for shaft-opening. High capital requirements brought organization of some joint-stock firms in both coal and iron, though the latter proved less than successful. The more modest start-up costs for single-function textile mills (spinning, weaving or printing) made the private company (proprietorship or partnership) standard there. Expansion in all three sectors was funded largely by retained earnings, supplemented by occasional recruitment of additional partners, who in some cases were shortly bought out to restore control to the firm's originators.

Working capital needs led firms to seek assistance from regional banks and, in textiles and iron, to participate in organizing such institutions, assembling savings pools from which they could expect to draw. Though mortgages and other property frequently secured large loans, manufacturers' personal notes were widely accepted, while overdraft privileges made avail-

able additional credit, both unsecured and instantaneous. In all these machinations, London's venerable financial institutions played only a marginal role, handling the numerous bills of exchange that greased the complex transactions of the textile trades, with their seasonal shifts and dis-integrated manufacturing flows.

Yet "the City" did impinge on the regional financial institutions whose operations aided manufacturing firms. Local banks, overlent industrially, balanced their accounts by rediscounting their paper to London, engaging what Cottrell calls a "national distributive mechanism for credit." When London conditions tightened, poorly-managed regional banks were imperilled, "the supply of industrial credit (being) particularly sensitive to conditions in the London money market" (33). This vulnerability might be crucial for newly-started firms, in which low initial profits mandated "finance . . . for both stocks and plant." Tight money in London would send waves through provincial banks that in turn might spell bankruptcy for new firms heavily dependent on credit for working capital. High failure rates did indeed occur, indicating that though profit plowbacks fed expansion of viable firms, many, perhaps most, incipient manufacturing ventures failed to survive long enough to enjoy the benefits of accumulation. In knitting together the affairs of entrepreneurs, banks, and the national credit and capital structure, Cottrell allows us to see a crucial component of the industrial system in motion. For this, for judicious speculations, and for reminding us that "short-lived firms which may have been more typical have left few traces of their existence," he deserves applause.

The intricacy of developments in later eras can here only be suggested. Cottrell documents the shift in the legal environment for launching "limiteds" (1855-1862), but is at a loss to account for the success of liberalization in Parliament given widespread and influential opposition to alterations in the earlier system. This issue clearly needs fuller attention by a historian whose political sensitivity matches Cottrell's economic capacities. In exploring the tide of public company promotions that followed eased regulation, we are reminded that conversion of private firms was quite frequent; that common (and voting) stock was kept in the proprietary circle while preferreds and debentures were offered to the public; that despite the move toward incorporation in other sectors, textiles, outside Oldham, remained heavily private; and that industrial shares continued to be a regionally-traded commodity, with London banks, financial houses and exchanges playing only rare roles in handling industrial securities.

Problems with source material lead to a slightly skewed emphasis concealed by the book's general title. At all periods, private firms constituted an important segment of the industrial apparatus, but Cottrell's analysis focuses

heavily on the public (incorporated) firms, documentation of whose activities was required by statute. Thus in addition to failed firms about which we know little, there are a host of proprietary operations whose finances are nearly opaque. One bit of negative evidence from that quarter is, however, crucial for Cottrell's overall conclusion.

When company law was adjusted in 1907 to permit private firms limited liability protection without disclosure, so long as they did not seek capital from the public, tens of thousands of firms embraced the new privilege. That is, the bulk of English incorporations were *not* undertaken in order to use financial intermediaries for capital acquisition. If industrial expansion and renewal was not facilitated by a national financial structure that was admittedly imperfectly developed, it was largely because there was little demand for such activity on the part of most manufacturing firms, which continued to rely on internal savings for retooling. Thus, Cottrell argues, the stagnation of English manufacturing can hardly be laid at the door of the financial community, which proved generally adequate to handle occasional massive national flotations and modest regional efforts at share-sales, as provincial banks provided considerable working credit to support local enterprise.

Though its technical language is at times as forbidding as its cover price (\$40), Cottrell has authored a book which deserves wide consideration. It will be of especial interest to American historians who dare imagine that industrial finance is not coterminous with corporate finance. Those seeking clues toward penetrating the financial world of proprietary manufacturing, widely present in Pennsylvania, will be well repaid for a close reading of this study of the English context.

Equally stimulating is Patrick Joyce's analysis of factory culture in Victorian Lancashire and Yorkshire, a work whose challenging insights and synthetic breadth should make it a magnet for critical discussion for years to come. Joyce asks anew one of the persistent questions of English industrial history: How was it that, after the great union and Chartist agitations before midcentury, the British industrial working class settled into a rough acceptance of manufacturers' dominion over factory and town? While liberal opinion may credit manufacturers with being the bearers of progress, seeing workers as at last persuaded by rising living standards to acknowledge their benefactors' prerogatives, neither the rise of Labor politics nor the intractable oppositions of the current century fit readily into such a perspective. A more complex explanation has arisen among labor historians, who argue that the consolidation of a "labor aristocracy" split the working classes with the more skilled elements gravitating toward acceptance and even advocacy of a system in which they enjoyed advantageous positions relative to other workers. One

key to this accommodation is considered to be the establishment of an "ideological hegemony," a setting of the terms of debate, by the holders of capital, terms which when adopted by workers' spokesmen so narrow the options for speculation as to exclude radical or revolutionary activity. Joyce rejects this focus on an elite within the working class and upon abstract ideals, asserting that to comprehend the acquiescence of the factory masses, we need turn to their experiences of work and life in the mills and towns to expose the relationships which constituted a distinct "factory culture." It is through that set of relationships that paternalism and deference are created and sustained, as factory culture functioned "at the centre of people's daily concerns, in terms of their sense of personal and community identity. This was so because work got under the skin of life" (p. xv).

In order to specify the elements which contributed to "factory culture," Joyce adopts a comparative stance, building a detailed contrast between the paternalist stability (including institutionalized trade unionism) of cotton Lancashire and the persistent antagonism between master and man (shading into radicalism) of the woolen West Riding of Yorkshire. He notes carefully the centrality of the family firm in both cases. Yet in the West Riding, where firms and towns were small and craft skills crucial, where manufacturers stood too near their workers to nurture distance and deference, where the economics of the trade were more erratic, the cultural relations of factory paternalism failed to mature. Lancashire was the seed-bed instead, its urban clots somewhat humanized through neighborhood residents' identification with the district-dominating firm, which provided not only steady work but also canteens, libraries and excursions for workers and their kin. Perhaps more important than services were the personal exchanges and favors which reinforced a pattern of unequal mutual obligation. From allowing workers to secure places for relatives to simply circulating on the mill floor, addressing long-term workers individually by name, paternalist employers demonstrated their commanding role while simultaneously affirming both the dependence and the human individuality of their employees. The gentry background of many Lancashire industrialists links this phenomenon to an older paternalism. As Joyce observes, "not only did the industrial rich not spring from the 'plebeians', but they often came out of landed society itself. In Lancashire especially, there was a substantial urban, industrial Toryism that often owed much to the landed pedigree, and which continued a close social and political commerce with landed society" (p. 1). In pursuing the origins of the textile capitalists, *Work, Society and Politics* is informed by its author's introductory assertion that "the history of the factory workforces cannot be understood without the history of the factory owners" (p. xxiii), a salutary reminder to industrial historians everywhere.

In the later chapters, Joyce turns to examine the political culture and religious dimensions of factory society, arguing for the stabilizing importance of rituals which reinforced "traditional authority and . . . communal loyalties" (p. 276). Among these were great demonstrations and processions in which factory masters figured prominently and which "provided the semblance of power in the feeling of numbers" (p. 278). The influential presence of the millmen outside their factories' walls was felt in voting patterns as well as church and chapel. It is in this sense that "factory culture" denominates a good deal more than the social relations of production, investing the entire social and work space of the community. However, Joyce's assertion that this account can be extended to industrial relations outside his two regions will not readily meet with agreement. The Northern metropolises (Liverpool, Leeds, Manchester) are too "economically various" (p. xxiii) for inclusion, not to speak of London's exceptional development. It may well be expected that other specialized regions of manufacture (shipbuilding, pottery) and extraction (especially coal) will have contrasting patterns of labor-capital relationships. Yet those who now seek to explore those areas and sectors will gain much from Joyce, for he has accepted and mastered the challenge of complexity, setting a standard which will be difficult to match while raising issues impossible any longer to sidestep. This is true as well for students of American industrial history, who have long focused on the great corporations and their conflicts (Homestead, Pullman, mining and railroad strikes) rather than deal with the family firms and the long silences. In sum, *Work, Society and Politics* will stimulate both theoretical imaginations and practical research questions; it is essential reading. (In passing, Rutgers University Press merits praise for managing to release this book in the U.S. for less than half the price of the original British edition (\$25.00 vs. £24). May they continue this admirable practice!)

Like Joyce, David Jeremy takes as his point of departure something which we broadly and vaguely "know" happened and seeks to delineate *how* it came to be. Yet where the former imaginatively and satisfyingly reconstituted the situation surrounding the placidity of Lancashire textile labor after 1850, the latter's *Transatlantic Industrial Revolution* handles the process of textile technology diffusion from Britain to the young American republic somewhat less satisfactorily. It must immediately be acknowledged that Jeremy's work is clearly pathbreaking, spanning a half-century of innovation and diffusion in both directions across the Atlantic and treating cotton and woolen spinning and weaving as well as printing technologies. Few, if any, efforts have been mounted to detail the spread of knowledge, technique, and machines on such a scale, a point the author rightly notes in his introduction. Moreover,

Jeremy does not confine his vision to the movement of devices, in parts, model or plan, but wisely observes that "much of the textile technology of this period resided in people" (p. 4), e.g., rules, formulas, the minutiae of arranging a mill floor, skills and sensitivities that could make or break a newly-started production venture. Thus broadened, the tasks of diffusion-of-technology scholars, at least for the early industrial era, involve tracing the movement of both men and mechanisms to new locales. This of course doubles the problems confronting the historian, and *Transatlantic Industrial Revolution* addresses enough of them to have merited the 1981 Dexter Prize of the Society for the History of Technology, one indication of the work's presence at the frontier of current scholarship.

Jeremy argues that the "artisan" served as the "preeminent technology carrier in this period" (p. 254), roughly 1790-1830s, particularly in cotton and woolen spinning. For cotton weaving and printing however, "American visitors to Britain" proved particularly important as the development of powerlooms and rotary printers was incomplete at the time American capitalists sought to commence manufacture. American entrepreneurs considerably modified these imported technologies by the 1820s, with market, labor and tariff factors shaping these alterations. Some stateside innovations could be and were integrated into British production, but the coarse cotton-goods array that laid the foundations of the Massachusetts industry departed utterly from the pattern of British development and was not adopted. In documenting these and many other points, Jeremy sifted patent, immigration and company records, contemporary and later technical literatures, census manuscripts and government reports on both sides of the Atlantic, a marvel of historical thoroughness. Yet there are several elements in his exposition of the diffusion process which left me uneasy and which together may point to a theoretical difficulty of some importance.

To document the carrier-role of artisans, Jeremy supplements standard biographical sources on individual immigrants with three large-scale sources: British Customs passenger lists for the mid-1770s, U.S. registries of alien residents during the War of 1812, and another set of passenger lists (U.S. arrivals) for the 1820s. Each offers some occupational data, and each has substantial shortcomings which the author notes. Certainly questions about their comparability and the wide gap between the first and second set ought to be voiced. Surely Jeremy's practice of calculating occupational breakdowns to hundredths of a percent is a bit much. Nonetheless, the tabular data does display over 800 "operatives," "managers," and "machine makers" in 1812, and nearly five thousand entering the three principal ports between 1824 and 1831, each group over half self-declared "weavers."

Jeremy then proceeds to impeach this evidence of substantial textile-related

migration. He argues that the weavers' probable handloom skills were obsolete, that the age-distribution shows too many young workers for their accumulated knowledge to facilitate transfer of valuable information, and so forth. These "shortfalls between immigration and industrial expansion" indicate that British immigrants could have filled only between a quarter and one half of "new jobs for male workers" (p. 161) in cotton and woolen mills in the 1820s. Thus Jeremy observes and concludes that, "well over half of America's cotton mills and something under half of its woolen mills would have been running (in the 1820s) without the assistance of immigrant managers and operatives. During the War of 1812 and perhaps even earlier, American textile manufacturers began to cross the threshold into economic and technical independence of skilled industrial immigrants" (pp. 162-3). This seems to me an extraordinary conclusion. Rather than indicating that surviving sources lead to a null hypothesis with regard to the adequacy of immigrant flows for technology diffusion, Jeremy affirms the contrary: that American entrepreneurs had achieved a considerable measure of "economic and technical independence" by the 1820s. That the "threshold" was crossed about 1812 seems rather an extreme inference from an imperfectly preserved and readily evaded wartime government registry, which aliens may well have regarded with suspicion and in which naturalized citizens may remain invisible.

If they were not from immigrant sources, whence did come the key skilled personnel? Though pioneer firms may have spun off some workers who aided successor enterprises, and native machinists could have been knowledgeable about wood and metal-working, neither textile craftshops nor farms seem likely sources for this body of artisans. (Jeremy does not pursue this, though source materials to answer such questions must be fairly thin in any case.) Even if there were too few in-migrants to fill the new jobs, other inferences are plausible. An inadequate flow may well have contributed to the frequent failures of ante-bellum firms; skilled workers' truculence may well be connected with their realization of manufacturers' persisting *dependence* on their specialized knowledge, the close guarding of which Jeremy illustrates regularly. This leads toward another point.

While he nicely portrays the frustration of firm owners with their key operatives' reluctance to part with technical information central to the production process, Jeremy sees this problem as an obstacle to diffusion (which it was) but not fully enough as a representation of a deeper power-struggle over the definition of the wage relationship. Were a printery superintendent made partner in the firm, he *might* feel obliged to share his hard-won competencies with his associates, but as an employee, he and many like him simply got out the work. Whether they anticipated starting on their own

account or were simply resisting doing themselves out of a job, they conserved their knowledge. Manufacturers who failed to respect that boundary might reap bad work, enhanced secretiveness or "migration" of key personnel to other firms. In omitting to reach analytically for those cultural dimensions of factory power relations, Jeremy misses an opportunity to mine more deeply some of the marvelous material he has assembled.

There is another dilemma inherent in matching aggregate textile immigration with new-job creation against a background of technology transfer. Two simultaneous processes are in motion: the introduction of novel techniques and devices and the wide implementation of operating know-how necessary for effective production. While "perhaps a few dozen" immigrants could initiate the former, assisting in "setting up prototype mills" (p. 255), how many were necessary for the latter gearing to take hold? Of the over 18,000 "new jobs for male workers" spawned by the expansion in the 1820s, and spread among some 1300 mills, what proportion necessitated substantial mill experience? At this level of shop floor production relations, Jeremy's sources prove largely silent. Yet if we cannot assess the proportion of skill-bearers who energized and directed the considerable range of textile formats in operation at that date (c. 1831-32), how can the human side of the diffusion process be approached with any confidence, how can the adequacy of immigration flows be probed and generalizations mounted on the basis of terribly soft tabulations?

If there are difficulties with the treatment of artisans, Jeremy documents instances of American firms' adoption of British machine advances with a surer hand. For textile specialists, his accounts of innovations and modifications will prove enlightening. The internal diffusion of these alterations among American mills rests less clear, partly the result of imperfect sources. For the generalist in industrial history, however, the technical demands of the text may be overwhelming. Without a working textile vocabulary, regular recourse for the glossary will be mandatory. The machine illustrations are inadequately captioned for other than a specialist audience.

Here we confront a double-pronged problem of theory and method. As Jeremy and others have wisely expanded "technology" to include a human component, current researchers must possess sensitivity both to social and technical dimensions of production, a fairly staggering requirement given the narrowing boundaries of disciplinary training. Crucial questions, reformulated in this broadened vision, may then confront sources insufficient for their ready solution. Second, the very complexity of the processes whose delineation is sought demands a mode of presentation that permits access to the core research insights by the widest possible audience. Reconceptualized historical approaches may also need a reformulated style of historical writing,

a rhetoric which integrates theory and data, process and instance with imagination and conviction, in a fashion that reaches out to readers in related fields suggesting both linkages and new questions for exploration. Neither of these challenges are met adequately in *Transatlantic Industrial Revolution*, a volume whose strengths and shortcomings are substantial and the result of its author's attempt to operate at the edge of his discipline. Both the phenomena it details and the dilemmas it exemplifies merit our most careful reflection.

With *Frontiers of Change*, Thomas Cochran adds an ante-bellum volume to his surveys of the later eras of American business and industry (i.e., *The Age of Enterprise* and *The American Business System*). A synthesis of "the literature" both old and recent, *Frontiers* will prove a disappointment to those familiar with Cochran's other works, particularly those based on his own meticulous research. Contrary to those who might imagine American industrial development to be a product of the efforts of "national leaders and followers" (p. 145), he argues that resources and geography, supported by a "favorable cultural heritage" prove the key elements. Yet Cochran's notion of "culture" is surprisingly homogeneous, edging toward depicting a common American spirit that invigorated national development. That those bearing a "desire for the new" may have been but one of a number of sub-cultures in earnest conflict over the shape of the nation might have been a more plausible assertion, but the regular usage, "American culture," universalizes and flattens analysis.

The narrative is, to my mind, strikingly uneven. In early chapters, Cochran mixes dubious generalizations about the behavior of contemporary Third World countries with incisive reminders that sectors other than textiles were also central to the industrialization of the Early Republic. Relying on recent work done by Diane Lindstrom and Morton Horwitz, both intra-regional development and the changing legal context are crisply explored, yet the narrative is studded with unsupportable counterfactuals (pp. 32, 44, 69). As it proceeds toward mid-century the text becomes clearer and tighter. On the whole, *Frontiers of Change* celebrates industrialization rather more than it analyzes and accounts for it, a problem which might have been avoided by engaging a rather more critical and precise notion of culture as its organizing motif.

For scholars of Pennsylvania industrial history, the first three books here considered each open avenues to enriching the projects we may contemplate. Though great enterprises (the Pennsylvania Railroad) may have hogged center stage to date, much remains to be excavated concerning the credit and finance relations of proprietary firms, the role of metropolitan banks and commercial houses in a manufacturing world not fouled by stocks and de-

bentures. A milieu of kinship and contacts, overdrafts and partners, existed in the Philadelphia region during the nineteenth-century (vide *Rockdale*); insight into the financial relations of small and middling manufacture and its legal context is long overdue.

From Joyce, we may locally inquire about the constituent elements of life and work in factory towns and neighborhoods. To focus on strikes, crises, big firms, or single ethnic groups generates a perhaps crippling narrowness of vision; the injunction now may be to establish the structure of the proprietary class, the characteristics of production in various sectors, the relationships that facilitated accumulation and the manifestations, if any, of factory culture in politics, religion, and community. From Conshohocken to Aliquippa, questions derived from *Work, Society and Politics* could well fill the air. Jeremy's work sounds a cautionary note, for the increasingly complex level at which these studies must proceed calls for a theoretical facility and a synthetic capacity of a high order. At a minimum, *Transatlantic Industrial Revolution* indicates that local studies be more than *set* in a wider context — they must be *conceived* amid the fullest possible awareness of that context, which as early as 1800 had an international, as well as inter-regional dimension. It may well be that the "entry cost" in preparing for such research rises substantially as we appreciate the diverse skills that inform the best work. Yet the achievements of our British colleagues and the considerable ferment in American business and labor studies together indicate that a more comprehensive reconstitution of the industrial past than hitherto imaginable may be within our reach.

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