Iron and Steel in the Pittsburgh Region: The Domain of Small Business

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In Canada we have a political party, the Progressive Conservatives, whose name outsiders often regard as a rather outlandish oxymoron. Yet, in many respects I think the name could well be applied to Pittsburgh independent iron and steel producers during the period from 1870 to 1960 because they followed relatively progressive or innovative means to achieve essentially conservative ends. Alfred Chandler has defined "modern business enterprise" as the creation of multi-unit entities run by professional managerial heirarchies [4]. These independent manufacturers were the very antithesis of that concept. Their mills, although large by convenience store standards, were essentially single-unit, small-business enterprises, most of which were run by family members or an occasional outsider in a personal, perhaps even idiosyncratic manner. As such, they hardly qualify as "modern business enterprises." One might be tempted to dismiss them as unimportant if not for two factors: these mills were highly successful and profitable over a very long period, and the decision to remain relatively small and local involved a very clear choice on the part of the mill owners. They had developed a particular *mentalité*, one that stressed success and control on the local scene, and they innovated just enough to maintain that control. Their small size and unwillingness to engage in adoption of the kind of high throughput, mass-production innovations that Chandler discusses were the result of a coherent set of decisions designed to maintain their control of the economic, social, and political environment of Pittsburgh. Whereas Chandler has viewed the emergence of managerial capitalism as an essentially economic phenomenon, it is important to recognize that for most smaller businessmen, local social and political motives were often as important as the purely economic. Only by recognizing these social and political motives can we fully appreciate the nature of the innovations attempted by these millowners.

Pittsburgh's wrought iron and crucible steel manufacturers were faced with an imposing crisis in the late nineteenth century. In the mid-1870's Andrew Carnegie had introduced to the region for the first time Bessemer steel production on a large scale. His company and the steel it produced soon not only dominated the country's massive rail industry, but also infiltrated other industries. This was perceived as a crisis that threatened their individual firms, as well as the entire older iron and steel industry and the communities and workers who were dependent upon it. It soon became abundantly clear that Pittsburgh's iron and steel manufacturers had three choices. They could

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adopt large-batch Bessemer production methods to compete with Carnegie and others who were usurping their markets. They could simply close up their mills, leave the industry, and turn their attention to investments, banking, or some other activity outside the industrial arena. Or, they could look to developing new products and alternative technologies to service new markets as a way of staying in business. What was their response?

Little attention has been paid to smaller independent manufacturers [1, 2, 3, 8, 9, 10, 11, 16, 17], and almost nothing has been written about the small, independent iron and steel manufacturer. What little we learn of them indicates that they either attempted to compete directly with Carnegie in Bessemer steel production and failed, or that they simply banked their furnaces, shuttered their mills, and left the industry. This was not the case in Pittsburgh. In that city--the very cockpit of industrialism in the iron and steel industry--smaller independent iron and steel mills continued to dominate important segments of its economy, society, politics, and culture. Although the older iron manufacturers attempted to challenge Carnegie (and failed spectacularly), and although a fair number of them did willingly or unwillingly close their mills and leave the industry, the vast majority survived and prospered well into the twentieth century. They were able to do this by innovating primarily in products and markets, as well as by making some important advances in technology.

In 1874, on the eve of the opening of Carnegie's Edgar Thomson Works, there were twenty-nine independently owned wrought iron works and eight crucible steel mills in the city. They were mostly small affairs, with the largest (American Iron) producing just 50,000 tons of iron annually, while the smallest (Crescent Steel) made 4,000 tons of steel. Over the next quarter century, these independent iron and steel makers were assaulted by Carnegie's massive Bessemer plants, by huge vertically integrated operations in other cities, and, finally, by the emergence of the billion-dollar U.S. Steel. By 1901 just thirteen of the mills that had been organized prior to 1874 were still in operation, although an additional nine independent mills that had been organized between 1875 and 1895 were also functioning. The latter brought the total of surviving independent mills organized prior to 1895 to twenty-two, a decrease of almost 40%. At first glance, this would seem to be an impressive decline, but it neglects another important phenomenon taking place. Many of these same families, even as the great merger mania was proceeding, organized some fourteen new, independent iron and steel firms in Pittsburgh at the turn of the century. This brought the total of Pittsburgh independent iron and steel firms in 1901 to thirty-six, almost exactly the same number as in 1874. It thus appears that the older Pittsburgh families and their independent mills emerged largely unscathed from the vast transformations of the late nineteenth century. Now, it is true that the structure of the steel industry in Pittsburgh and elsewhere had changed profoundly, but we must not let that distort our image unduly. From the point of these millowners and their mills, they were still operating on a scale and manner similar to earlier years.

Of those firms that did disappear, a few were driven out of business by Andrew Carnegie; others were absorbed by other independent operators, such

as Jones and Laughlin (J & L) and American Steel Casting. The rest were taken into larger consolidations. Of those consolidations, Crucible Steel, which was owned and operated by a consortium of formerly independent Pittsburgh steelmakers, took in most of the crucible works. U.S. Steel absorbed all or part of eighteen Pittsburgh firms that had been organized during the nineteenth century. One thing was characteristic--with only a couple of exceptions they had been organized later in the century, founded by men like John W. Gates, or Edgar C. Converse, who as relative newcomers, were marginal to the Pittsburgh upper-class social scene.

The independent mills in the Pittsburgh area (including Crucible Steel) had total capacity in 1901 for nearly four million tons of iron and steel annually. U.S. Steel made just over seven million tons of finished rolled iron and steel products nationwide. Independent iron and steel firms, excluding those in the Pittsburgh region, accounted for about three million tons of production nationally. Thus, it would appear that the independent iron and steel makers in Pittsburgh were doing very well for themselves, far better than we might have expected from earlier literature.

This relative success continued during the next half century. In 1911 and 1920 nearly 80% of those independent firms operating in 1901 were still functioning profitably. The second merger wave of the 1920's, with the creation of Republic Steel, Wheeling Steel, Youngstown Sheet and Tube, and a number of other consolidations, hit independent firms with some severity. Just 50% of those from 1901 were still in operation in 1930. Then the depression of the 1930's finished off a number of the rest; by 1940, just eleven of the thirty-six independent firms of 1901 were still functioning. As we observed in 1901, simply focusing on survivors distorts the picture of what was occurring because significant numbers of smaller independent firms were being launched each year.

Looking at the mid-1950's we see more fully the importance of these independent iron and steel firms on the Pittsburgh scene. Outside of U.S. Steel, we find twenty-two independent firms in operation. Of these, three were rather large integrated operations; at least two of them (J & L and Crucible Steel) were controlled by old Pittsburgh iron and steel families, and the third (Pittsburgh Steel) was also largely locally directed. Of the other nineteen, five continued from the nineteenth century, and only two were started after 1945. This left a dozen that had been founded sometime during the first thirty years of the twentieth century. The twenty-two firms ranged in size from a capacity for over six million tons (J&L) to just under 12,000 (Vanadium Alloy Steel). These figures would appear to indicate a surprising record of survival and continuity over an extended period, a time during which steel technologies changed profoundly, markets altered drastically, and the economy and industry itself were transformed almost beyond recognition. How did they manage such a remarkable longevity?

The key to comprehending the success of these Pittsburgh iron and steel manufacturers is to understand their *mentalité*, one that postulated the importance of maintaining a local manufacturing base and more localized and specialized markets. This *mentalité* contained a number of important elements. First, it entailed a desire to remain relatively small. Innovating

dramatically in terms of mass production, vertical integration, and national markets entailed risks these manufacturers were not willing to take. There was, of course, the principle danger of failure, of destroying carefully nurtured family nest eggs on projects with a high risk factor. But success entailed nearly as many risks for them as failure. That is, to succeed in the high throughput, mass-production end of the industry took an enormous amount of capital, more than one family or even a group of families could put together. This meant they had to turn to the securities markets, and that, in turn, meant they would lose control of their enterprises to investment bankers and professional managers. Loss of control of their mills meant that they would lose power all along the line. They would lose influence in the economic, political, social, and cultural affairs of the city and region. They would become members of a rentier class, tolerated for their lineage, but largely without practical influence. Thus, the decision of these independent iron and steel makers in Pittsburgh to remain small was no accident. It was part of a well-conceived plan, one that cautiously pursued innovation to achieve a profoundly conservative end, the continuity of their power and influence in the affairs of Pittsburgh [6].

Although most of the independent operators' innovations occurred in areas of product and markets, there were some attempts at more aggressive technological adoptions. There were at least three attempts to adopt the Bessemer process on a large-scale basis, though each attempt failed for different reasons. A few others somewhat successfully installed smaller-scale Bessemer operations, which were designed to provide steel billets for their own structural shapes (J & L, Juniata Iron and Steel, Pittsburgh Steel Casting, National Tube, and Hainsworth Steel). A far larger number of these manufacturers, however, adopted openhearth steelmaking in the late nineteenth century. The early openhearth furnaces were hand charged with cold metal, which meant that costs of production varied only slightly with size. In the early years openhearth steel, unlike Bessemer, provided less impetus to vertical integration and increased scale of production. Consequently, openhearth steel was better suited for small-scale production and could therefore be used for structural steel, angles, wire, sheet, and plates without the necessity of developing large integrated-production facilities. This process was therefore more in tune with the psychology and *mentalité* of these independent operators.

In addition, the openhearth furnace was in many respects an enlarged puddling furnace. This allowed older iron manufacturers and crucible steelmakers, most of whom had bitterly opposed Bessemer steel, to embrace this new technology with less stress, since it involved a less profound transformation of the existing shop culture. Yet, the conversion was not a painless transition either. Unlike the old "rule-of-thumb" methods of the iron operations, openhearth steelmaking was heavily oriented to chemical engineering. Decisions on the correct refining process to produce quality metal were no longer made by skilled workmen at the furnace, but by scientists in the laboratory. This brought a change to some of the time-honored ways of doing business, but at the same time allowed the mill

owners to gain increased control over production processes that had formerly been dominated by their workers.

So, Pittsburgh's smaller metals manufacturers rapidly converted to openhearth steelmaking in the late nineteenth century. In 1884 there were just four plants in the area producing openhearth steel. Ten years later there were eighteen openhearth operations in the city. Carnegie Steel by this point had massive openhearth operations, but the plants of other Pittsburgh manufacturers ranged in size from 100,000 tons annually for Carbon Steel to just 4,000 tons at LaBelle Steel and Chartiers Iron and Steel. Openhearth production, then, was a "friendly" technology, one that allowed independent iron and steel manufacturers to eliminate certain types of skilled labor, produce somewhat larger amounts of decent quality metal for their specialized markets, and retain much of the production "culture" they had long cultivated in their wrought iron and crucible mills.

Despite the rather large group who adopted open-hearth production, a fair number remained committed to older wrought iron and crucible steel technologies. Firms like Sable Iron, Vesuvius Iron, Byers Pipe, and others never adopted any of the newer production techniques, yet remained successful and prosperous well into the twentieth century. The key innovation for these mills, as well as for those who managed operations that did adopt some of the newer technologies, was to find profitable market niches. To that end, they continually sought out markets of a more specialized nature that could be serviced by small production runs of specialty iron and steel. A majority of the older Pittsburgh iron and steel mills followed this path to long-term success.

Andrew Carnegie had attained success by mass producing a cheap, homogeneous product. The older Pittsburgh manufacturers found success and profit by manufacturing small quantities of carefully differentiated, high-quality products. By its very nature it is nearly impossible to generalize about this phenomenon. It was, in fact, precisely those characteristics that made it difficult for large-scale producers to enter this field. If the markets had been amenable to generalization, products and market strategies could have been standardized, and large-scale producers would have conquered them. In general, however, larger firms like U.S. Steel did little in the way of steel fabrication, which opened that area to smaller producers such as those in Pittsburgh.

The Byers Pipe firm, for example, never made steel of any kind. It proudly stuck by wrought iron throughout its existence. Its innovations came not so much in the type of product it made--wrought iron pipe--as in the specialized markets it pursued with this high-quality product. Using its connections in the late nineteenth century with the Mellon and Guffey families in the Pennsylvania gas and oil industry, the Byers' executives built a lucrative market for its pipe as the industry spread to the Southwest during the first half of the twentieth century. Its pipe was also used extensively for irrigation systems and hydraulic mining. Similarly, old-line wrought iron firms like Sable and Vesuvius Iron and Oliver Iron and Steel continued to make bar and sheet iron, rods, hardware, and other products for customers who appreciated

personal service and a tolerance for smaller orders. All three firms persisted until well into the twentieth century.

But it was those independent Pittsburgh firms that converted to openhearth production that also generally demonstrated the most innovative approach to finding specialized market niches. One of the product areas that opened up to these manufacturers was alloy steels, demanded by the nascent automobile industry and other consumers. Parts made from mass-produced steel were constantly breaking down; the auto industry needed specialty steel with properties not found in the common product. Large producers like U.S. Steel were not interested in making this product because of the then relatively small amount of steel involved in the orders. Automakers therefore had to turn to foreign producers and to the smaller American steelmakers. With the development of vanadium steel and other alloys after 1907, Pittsburgh's smaller mills, such as Allegheny Ludlum Steel, Firth-Sterling Steel, Latrobe Steel, Union Electric Steel, and Vanadium Alloy Steel, found a highly profitable market segment. This was just one aspect of the Pittsburgh marketing approach. Others specialized in a variety of products. Blair Strip Steel and Superior Steel made cold strip steel for a few low-volume consumers. Columbia Steel Shafting made cold finished bars and Lockhart Iron and Steel also made bars for tool makers and others. These manufacturers continually sought out consumers with specialized needs, using their smaller size and orientation toward quality products to fulfill these profitable market niches.

All of this was simply part of a broader *mentalité* on the part of these Pittsburgh iron and steel producers, a desire to retain control of the city on all levels. Refusing to compete directly with Carnegie and U.S. Steel, and instead finding new products and markets, allowed them to create relatively small, but highly profitable, enterprises. This, in turn, allowed them to remain part of Pittsburgh's local aristocracy throughout the twentieth century. In that position, they influenced the city in a number of other ways, including labor and community relations, politics, and cultural activities.

A major shortcoming in much of the previous research on business has been a tendency to view it in a hermetically sealed environment. Business executives are seen as purely economic actors, and business decisions are considered almost solely in terms of rather narrow market considerations. In this context, the actions of Pittsburgh's smaller independent iron and steel makers seem rather misguided and irrational. After all, wasn't the firms' mission to expand to meet the demands of a new, undifferentiated national marketplace? Didn't the logic of technology and innovation literally force them to adopt new procedures and labor-saving machinery? And if they did not, wasn't that a form of historical sentimentalism, a fatal flaw that would doom them to failure? Like befuddled old aristocrats, these smaller Pittsburgh manufacturers hung on to outmoded means of production, antiquated products, and old-fashioned ideas of doing business for too long. As a result, they were doomed to the dustbin of history. Looking at the actions of these Pittsburgh iron and steel producers from a different perspective, however, alters that viewpoint radically. These men were, in fact, following a *mentalité* that was designed to ensure their long-term hegemony

over the economic, social, cultural, and political landscape of Pittsburgh, which was the only truly relevant milieu for them.

Throughout much of the nineteenth century, these iron and steel manufacturers had ruled their mills and city like feudal barons. They were the "best men" and the "first families," and few ever challenged their dominance. One area where they had gotten used to sharing their power, however, was on the plant floor. Iron production, as David Montgomery has pointed out, depended largely upon the skill of its workers, and the millowners long had to accept unionization and shared authority [12]. When Carnegie Steel at Homestead in 1892 and U.S. Steel in 1909 destroyed the power of the Amalgamated in their mills, some of Pittsburgh's smaller producers followed suit. A significant number, however, continued to operate as union shops long after the labor organization had been driven out of other mills. When the Sons of Vulcan was organized among skilled iron puddlers after 1907, most of its lodges were in the Pittsburgh area, and firms like Lockhart Iron and Steel and A. M. Byers accepted the new union in their plants with little fuss. Beyond that, the independent millowners continued to practice a modified form of paternalism, in which an older, more personal, and often more trusting relationship between millowner and millworker seemed to endure. It was hardly paradise, but records of labor-management relations at the Byers firm over the years reveal a pattern that was significantly more amicable and reflected more of a shared shop culture between owners and workers than was the case at giant steel firms [13, 14, 15].

This more paternalistic form of labor relations appears to have been part of a broader desire for a paternalistic hegemony and control of Pittsburgh by these independent millowners in the twentieth century. By forging marital alliances with other Pittsburgh families, these men were networked into families that controlled the banking and financial scene in the city.[1] In addition, their values dominated the public culture of the city, and they continued to cast a long shadow over the cultural and social institutions of Pittsburgh. Despite the rise of massive entities such as U.S. Steel, Gulf Oil, Koppers, Alcoa, and Pittsburgh Plate Glass, they continued to display at least a modified hegemony over their environment.

Much of this continuing influence and power, and the more indirect way in which its upper-class paternalism was exercised, was exhibited in the political reform movements of the early twentieth century. Although the situation is far too complex to develop in detail here, the main outlines of what happened in Pittsburgh can be presented. The coalition that brought Progressive reform to Pittsburgh in the early twentieth century was composed of two powerful civic organizations (the Civic Club and the Voter's League), along with the Pittsburgh Chamber of Commerce, the Pittsburgh Board of Trade, and an influential upper-class Episcopal congregation and its minister.

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[1]An analysis of the Pittsburgh *Directory of Directors* for 1906 shows quite clearly that virtually every heir of a nineteenth-century iron and steel family, along with nearly every family each one was married into, held banking directorships in the city, most of which were held in the large, dominant, central-city banks.

A coalition of older upper-class industrial families networked in these organizations.

Although Samuel Hays has argued that Pittsburgh reform was not influenced by "earlier industrial and mercantile families," and that most of those responsible for it were officials from U.S. Steel and other large, nationally controlled firms, my research indicates otherwise [5]. I found that of those members of the Civic Club who were involved in the city's iron and steel industry, 60% were from older, rather than newer, families. I further found that a significant proportion were in the city's *Social Register*. Focusing on the issue of corruption in the city's Magee-Flynn machine, the reform coalition pushed for the creation of a new city charter in 1911, one that abolished the ward system of councilmen and schoolboards. This diminished workingclass representation on these bodies and increased the number of elite or professional members. All of this was sold to the city's voters as being in the interests of all the "people." The older upper class relied upon their prestige, their lineage, and their deep roots in the community to give greater authenticity to its movements and curious reform ideology. A similar pattern was followed with cultural philanthropy, whereby a system of "noblesse oblige" was designed to create a better society, one that reflected more clearly the values of the dominant class.

As I argued in an earlier work, the older Pittsburgh upper class refused to become part of the "national, metropolitian class" that E. Digby Baltzell describes in his *Philadelphia Gentlemen* [7]. Although they sent their children to fancy eastern prep schools and colleges, and participated in a number of central exclusive institutions like the rest of the seaboard elite, when it came time for marriage, the vast majority continued to find mates among local upper-class families. They refused to sell their mills to Carnegie or Morgan, and they remained close to home so that they might better control their environment.

But this control did not come easily in the twentieth century. To survive in the economic realm they had to foreswear the large-batch, mass-production technologies that were sweeping their industry. Instead, they had to focus upon finding new markets and new products, ones that allowed them to retain many of their older systems of production and plant management and allowed them to retain an older and more paternalistic form of unionized plant relations. All of this was part of a broader philosophy of control. They found themselves in an unenviable situation at the turn of the century: massive steel producers dominated their industry and, along with others, appeared to exercise overwhelming dominance in Pittsburgh itself. The situation seemed so dire that the *Pittsburgh Survey* blamed most of the city's problems on "absentee capitalism." Additionally, the older Scots-Irish Presbyterian workingclass population of the city, which earlier had so closely reflected the makeup of the iron and steel manufacturers themselves, had given way to a polyglot of racial, ethnic, and religious groups.

The independent iron and steel makers used their prestige to craft new political coalitions in the early twentieth century, and, at the same time, found a way to appeal to the masses of unskilled immigrant workers. More than any other group in society, the men who owned the independent iron and steel

mills represented tradition and a retention of older, simpler values. However much they differed from their immigrant workers, they had that much in common. As a number of scholars have pointed out, immigrant religion and ethnic traditions were often used by the workers as a shield against the dehumanizing influences of the city and its mills. Ironically, the independent millowner himself, by appealing to Pittsburgh's past, to its religious traditions, and to the image of a seemingly simpler and gentler age, could "speak the worker's language" in some fundamental ways.

Yet these men were just as obviously not genteel old aristocrats who preached the gospel of anti-industrialism--an ideology that might cause Pittsburgh's workers to lose their jobs. They were men who conveniently had their feet in both camps. They represented both tradition and progress, continuity and change. Although these men ran large, modern, and profitable industrial mills, they functioned on a more human scale than the gargantuan enterprises of U.S. Steel and others. This *mentalité*, I would argue, is probably more characteristic of smaller businesses in the United States than the impetus that drove the large, mass-production concerns. These were individuals whose history and future were deeply imbedded in the local environment; continuing control of that enviroment was of paramount importance to them. To that end, they innovated in smaller, more subtle ways in plants, products, and markets. The goal was not to maximize profits and rationalize production as much as it was to maintain business at sufficiently profitable levels to ensure survival, while at the same time not growing so large as to lose their local orientation. With their economic interests focused largely on the local or regional area, these men had more time and latitude to concern themselves with the political, social, and cultural aspects of their city. Of profound importance here is the question of hegemony and control. Although the pattern that emerged in twentieth century Pittsburgh was radically different from the mid-nineteenth century, it produced a refracted image of the cozy world of the mid-nineteenth century iron barons. These millowners were successful innovators, but they consciously turned their backs on greater industrial expansion in order to remain "masters of their mills" and "lords of all they surveyed" in Pittsburgh.

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