The Role of Management in the Decline of the American Steel Industry

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> What many Americans do not know is that their own steel industry is bigger than those of all the other nations on earth put together. No other nation in the world could have matched that record. It is a record that stands as a glorious tribute to the men who make steel and the men who built steel in America.
>
> – Ben Fairless, Chairman U.S. Steel, *January 1951* [4, p. 13]

> We have been shocked out of our complacency and smugness. We now realize that American industry has no manifest destiny to be always first, always right, always best.
>
> – David Roderick, Chairman U.S. Steel, *May 1982* [4, p. 37]

The traditional interpretation of the post-World War II steel industry has been told as a three-part story. One part of the story involves big, nasty oligopolistic steel that charged monopoly prices and was slow to modernize. Another part involves the big, selfish United Steel Workers who, while being overpaid, bargained for work practices that raised costs and still went on strike to raise wages even higher. Finally, there was big (inept?) government that kept interfering and would not let the industry raise prices when it needed more revenues for investment. Depending on personal biases, it is easy to choose which parts of the story one finds most congenial. Paul Tiffany's *The Decline of American Steel* tells this story as well as any. He concludes:

> Prior scholarship has generally placed the primary burden of blame for these outcomes on company management. Due to errors in expansion planning, neglect of technological innovation, and perhaps the arrogance of corporate power in relation to price and labor policies, critics find the industry responsible for its own

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> problems. However, we have taken some exception to this rather narrow conventional analysis. While not denying that managerial inefficiencies did exist, we nevertheless found serious shortcomings in the foresight of labor leadership as well as in various public policies that affected steelmakers in the post-war era. [29, p. 186].

Much work has been done in the management literature both before and since Tiffany wrote. There has also been much work about the steel industry. Therefore, we believe that it is profitable to re-examine what happened in the period after World War II. Our overall conclusion is that the situation is much more complicated than many writers have indicated, but that management must indeed be held responsible. As early as 1960, Charles E. Silberman, made the same point:

> It would be a mistake, however, to regard the steel industry as just an innocent victim of a conspiracy between Big Labor and Big Government. For to some degree the industry itself contributed to the wage-price spiral by its own strategy. This strategy was to raise prices each time wages were increased, and, in fact, to raise them *more* than the increase in unit labor costs. The fact that price increases were preceded by above-average wage increases served to neutralize the political opposition to higher steel prices. But the fact that the industry passed on each wage increase with seeming impunity seriously weakened its ability to resist the joint union-government pressure at the next go-around. As a result, wages and prices chased each other upward, and between 1947 and 1957 steel companies actually increased their prices 25 to 50 percent faster than their unit labor costs [which in turn went up faster than materials] [27, p. 250].

But the management we will look at is not found in the big issues – the strikes, the government confrontations – but more in the ongoing decisions that had to be made. One problem is that nowhere in this reported story are there real managers making decisions. What did the top managers think about steel-making technology, about their customers and the quality they were providing, and about foreign competition? This paper will look at these questions.

We will use Michael Porter's "five forces" to examine steel management [25]. These forces include rivalry among existing firms, the threat of new entrants, the threat of substitutes, and the roles of suppliers and buyers.

Rivalries

U.S. Steel was formed in 1901, and management priorities became quickly evident: financial stability was to be maintained. This philosophy differed considerably from that of Carnegie Steel, which became a part of USS. Carnegie had dominated a highly competitive American steel industry. There

seemed to be a certain pride involved in creating better technology, no matter what the cost. For example, Carnegie Steel reduced the cost of steel rails from $36.52 to $12.00 a ton between 1878 and 1898 [13, p. 86]. William Campbell comments:

> The principle at Pittsburgh was to destroy anything from a steam engine to a steel works whenever a better piece of apparatus was to be had, no matter whether the engine or works was new or old, and the definition of this word "better" was confined to the ability to get out a greater product. Such a course involved the expenditures of enormous sums of money, it involved the constant return of profits into the business, it involved mistakes, but it produced results... [14, p. 532].

And Carnegie said in his autobiography, "Great secrets did the doctor [Fricke] open to us...Nine-tenths of all the uncertainties of pig-iron making were dispelled under the burning sun of chemical knowledge" [17, p. 2]. Carnegie's policies forced others to do the same in order to compete with him. "Much of Carnegie's success was derived from a combination of management techniques that have since become standard in efficient big businesses: recruitment of topflight executives, construction and acquisition of modern plants, systematic vertical integration, and continuous rationalization of process technology." Compare this to USS under Elbert Gary, which did little to rationalize, innovate product lines, or consolidate management structure [21, pp. 594-595].

For example, some USS executives wanted to establish a central research lab in the 1920s, but the proposal was rejected when it was thought that the cost of implementation would be too high. Organizational infighting by subsidiary managers also halted the plan as did the belief that research not directly related to short term commercialization was an unnecessary expense. Because of USS's short-term profit focus, any long-term research was seen to be irrelevant. Finally in 1927 the research lab was built, but again not without controversy. One manager indicated that "our priorities are taken care of in our own research lab," [30, p. 18] while the lab chief himself stated on behalf of USS president James Farrell: "research is needless because the corporation already knows substantially all they need to know about steel in order to make it at a profit" [30, p. 17]. Gary extended this arrogance by promising that only a partial lab would be set up since it would be headed by someone who would know where to get the help necessary to avoid full costs. Research was highly decentralized and uncoordinated.

The administrative, policy-making structure of the industry was always weak. Big Steel had a very stuffy environment which created managers but not leaders. For example, "The definition of intelligence or ability was to do things the Bethlehem way," John F. Heinz (a Bethlehem speech writer) remarked in 1985. "And the Bethlehem way was 'The way we always did it in the past.'" This mindset hindered the company, Heinz maintained. "The characteristic that each department had in common was that they were fiefdoms, going way back. The turf was inviolable and prizes did not go for objective intelligence or

academic training. Rarely were promotions based on merit" [28, p. 85]. As late as 1960, [8, p. 90] *Business Week* remarked that USS was transforming itself into a commercial enterprise, but that it "still has some way to go."

The early discussions of the post-war steel industry were often told as "competition among rivals." Big Steel began this period as the world's dominant producers. The industry reached its all-time relative high in steel production in 1947 when it produced 56.7 percent of the world's output of crude steel. It was dominant in the late 1940s because technology, scale, and productivity advantages existed. Only Canada reached an average plant size 50 percent as large as the average plant in the United States in 1954. Over 50 percent of total steel-making capacity in France and Britain was below one million tons, the minimum efficient size according to Joe Bain. Three quarters of Japanese plants were below this size, while 80 percent of America's were above [4, p. 18].

However, during the 1950s the European nations, as well as Japan, began restructuring their steel industries, often with financial and technical support from the United States. A decade later U.S. output fell to 25.9 percent of the world total. By 1982, the United States only commanded 9.2 percent of world steel production [22, p. 61].

Although the Americans had high unit labor costs, they still enjoyed greater labor productivity than their foreign competitors in the early post-war years. Wages in the 1950s were six times higher in the United States than Japan, but the U.S. labor requirement for steel was one third that of the Japanese. Although labor costs were a disadvantage to the Americans, the average cost of steel production in the U.S. was lower than the average cost of steel production in Japan during the 1950s. This seems to have changed by 1960 [5, p. 185]. In 1982, the United States produced steel at a higher unit cost than Japan, West Germany, France, and the United Kingdom [22, p. 42].

Evidence of rigidity in corporate thinking has often centered on the failure of management in the United States steel industry to implement the Basic Oxygen Furnace [BOF] technology in time, but the situation is more complicated than often supposed. BOF unquestionably became one of the greatest technological breakthroughs in the steel industry in the twentieth century. The BOF advantages include: 1) lower initial investment costs: in 1961, a BOF process could be installed for about $17 per ton of capacity as contrasted with about $35 dollars per ton for the open-hearth method; 2) lower operating costs with savings of between four and nine dollars per ton; 3) quicker production: it took about forty-five minutes to produce a "heat" of steel (a jargon unit of measure), as compared to about six and one half hours for the open-hearth method [16, pp. 1543-1555].

The argument that has developed, however, was whether USS and other American firms should have realized this in the early 1950s and avoided making the "wrong" kind of investment. Largely related to the issue of technology investment is the argument over whether to expand capacity in the late 1940s. If expansion was needed, the next question was what type of technology would be used?

In 1951 production exceeded capacity rates of plants in the industry for the first time. Government exerted pressure to expand capacity. Government predicted that the future demand for steel would continue to grow, and, although steel executives enjoyed the prospect of increasing profits, they were hesitant to expand because of the low operating rates that existed in the 1930s. Executives felt that the future demand for steel was uncertain and that steel demand was strong in this period only because of the demands emanating from the Korean War. The argument over capacity and future demand was to continue.

Eventually, steel executives decided to expand, but they did not just make marginal investments. The industry invested $40 billion dollars in the old open hearth technology. By the time the expansion was complete, no number of good management intentions mattered; the steel industry had made a fatal mistake. Indeed, the American steel industry invested as though the market growth for steel was robust, when in fact it was flat. The growth of steel consumption in the period 1950-1960 was 0.4 percent annually, while capacity growth was 4 percent annually. Though the capacity rate exceeded 100 percent in 1951, it would not exceed 95 percent any time after that: in the period 1951-1955 capacity rates averaged 89 percent, and by 1955-1960 with the expansion in place, average capacity rates fell to 73 percent.

It is difficult to understand how management's initial hesitancy to invest, particularly when they felt existing capacity was sufficient, led to a multi-billion dollar disaster. The resulting failure was two-pronged: one was the resultant financial weakening of the industry; the other was the technological crippling that resulted from capital widening rather than capital deepening, which led to slow BOF investment. Even by 1970, almost two decades after the technology was available, only 48.1 percent of the U.S. industry had adopted BOF.

Dilley and McBride [12] argue that the early 1950s was too soon to have known how successful the BOF would become. They point to other technologies such as the Kaldo converter which was developed about the same time and never won acceptance. The BOF was perfected in a small European firm in 1950. It did not have a large corporate research laboratory, and was smaller than any single plant at USS. When BOF was finally adopted in the United States, it was the smallest firms that adopted the new technology first, but, of course there were "special" circumstances used to rationalize their initial use of this technology, while the big firms hesitated.

The Canadian firm Dofasco installed the new process in North America in 1954. The same year McLouth Steel became the first U.S. firm to build a BOF. McLouth had less than one percent of the nation's ingot capacity. The dominant leaders of the American steel industry did not adopt this revolutionary process until fourteen years after the Austrian firm had first done so successfully.

Dilley and McBride point to all the peculiarities that led to the European study of this question and its initial adoption. Furthermore, they argue that what USS and the others did was to modify [rather than to build completely new] the existing open hearth [OH] technology. So a comparison of new OH versus new BOF technology is to make the wrong comparison. They argue it was more

economical to modify the existing OH technology rather than to make new BOF investment.

There is one major problem with this argument. Peter Drucker points to the relationship between today and tomorrow:

> Management has no choice but to anticipate the future, to attempt to mold it and to balance short-range and long-range goals...Long-range planning should prevent managers from uncritically extending present trends into the future, from assuming that today's products, services, markets, and technologies will be the products, services, markets, and technologies of tomorrow, and above all, from dedicating their resources and energies to the defense of yesterday [13, pp. 121-122].

Management failed because it didn't ask: "What do we have to do today to prepare for tomorrow?" The big firms, with their older equipment should have been the first to experiment, yet they remained stuck with the older technology. Why were only the European firms studying this technology? It is interesting that Dilley and McBride, both of whom worked for USS, never mentioned research that USS was doing on this furnace. It was almost as if it were an external technology. We would argue that USS, as the world industry leader, should have been studying oxygen processes even before World War II.

In fact, USS's major research effort in the late 1940s and early 1950s was concentrated on a side-blown converter [20, p. 20].[2] Carnegie-Illinois concluded this process was "fundamentally sound" in 1949 [2, p. 172], but Japanese attempts to build such a converter proved unpromising. Joseph Stone, the USS researcher in charge of the side-blown converter visited the Austrian Linz BOF plant in 1954. His favorable report was rejected by USS and he was reprimanded for making an unauthorized visit to the Austrian firm. It seems that a former open hearth engineer in USS's top management vetoed this line of research [20, pp. 161-162].

The importance of oxygen had been understood a full century before [1856] by Sir Henry Bessemer, but lacking commercial oxygen at that time, its use remained only an idea. However, the price of commercial oxygen fell dramatically beginning with the discovery of the Linde-Frankl process in the late 1920s. The price of oxygen then fell almost continuously from $11 per 1,000 cubic feet to approximately 40 cents by about 1970 [16, p. 1548].

Oxygen had been used in steelmaking in experiments in the United States since 1923, and oxygen was used in converters since the 1940s in Germany, Switzerland, and Austria. Adams and Dirlam provide more detail of other oxygen experiments [2, pp. 171-174].

Should USS and others have been doing earlier "BOF" research? Modern discussions of R&D point out that some highly successful firms do no R&D. MCI, for example, believes that they will become locked in to using the products of their own research and therefore will they not remain state-of-the-art [23,

[2] See 16, pp. 1669-71 for other research activities.

pp. 307-8]. Gore (Gore-Tex) does no formal research, but allows anyone working in their factories to "play" with their basic material, nor does Chaparral Steel [17, p. 11]. These three examples all include research that modifies existing technology. In fact this was the type of research that USS did – modification of existing OH technology. Leonard-Barton [19, p. 145] distinguishes between technical innovations that are competence-enhancing or competence-destroying. What would happen to these three firms if there was a competence-destroying change in the technology? We might expect that they, like the U.S. steel industry in the 1950s, would find themselves in difficulty.

Despite talk about stepping up comparatively laggard steel research and development [27], the research never materialized. Barnett and Schorsch report that:

> When compared to other U.S. industries, steel devotes a paltry share of revenues to scientific research. Steel R&D expenditures have been declining as a share of industry revenues over the past twenty years. From 1975 to 1980, less than 0.6 percent of the industry's net sales revenue was devoted to R&D; this places steel among the lowest of the major industry groups for which such data are kept [4, pp. 47-48].

One other explanation for the slow rate of capacity expansion has been given. Big Steel complained of low rates of return. Yet returns were comparable to other manufacturing industries in the 1950s.

Threat of Substitutes

Turning next to customers, we find that most accounts of the industry, if they include demand at all, look only at the final demand for various sectors. Old and Clark [22], for example, do not mention quality. Hogan [16] has a long section on demand, but does not mention quality either. Of course, much can be learned by looking at the quantity of demand. But another part of demand includes quality. Steel paid little attention to quality. We will also consider steel substitutes in this section since substitutes had a direct effect on how much consumers bought.

Until the 1960s , steel did not think much about its customers, other than to assume "that there will always be a market for steel – that is in the long run people will have to come buying steel" [27, p. 123]. A difficulty throughout the entire period was that the industry was never able to forecast demand accurately. They overinvested in the early 1950s but demand did not increase. Between 1955 and 1960 steel consumption dropped by 2 percent, steel production by 13 percent, while GNP grew by 12 percent [27, p. 126]. As a result, over three-quarters of the decline in steel consumption relative to GNP could be accounted for by the slowdown in the business of steel's traditional customers. Output was high from the mid-1960s until the mid-1970s. There were shortages in 1973-74, so the integrated companies responded with huge expansion programs this time,

but demand collapsed again. Steel overreacted to the high demand. Large BOFs were installed, but they were not always needed. Barnett and Crandall conclude:

> The Japanese meantime had pioneered large blast furnaces and by 1975 had a large share of the world's most efficient furnaces. The U.S. blast furnaces, by contrast, were much smaller and less efficient. Also, by 1975, 31 percent of Japanese steel was continuously cast while only 9 percent of U.S. steel was. *Modernity and efficiency were more than simply a matter of toting up BOF capacity* (italics added) [5, p. 39].

Why were the forecasts so often wrong? In part, because there were substitutes for the use of steel. The aftermath of the energy crisis of 1973 brought setback to the industry. When the automotive industry embarked on a small-car crash program to meet new fuel-efficiency standards, the average American car, which weighed 3,850 pounds in the mid-seventies, shrank to 2,800 pounds by the 1980s. Lighter materials – plastics and aluminum – permanently reduced the use of steel on dashboards, bumpers, and fenders. Add to the changing automobile picture the impact of changing life-styles, with fresh and frozen foods replacing canned foods, and beer and soda drinkers buying their beverages in aluminum cans, and the negatives for big steel were staggering [26, p. 102]. Prestressed concrete and lighter steels all caused the demand for steel to tumble.

Pricing

Pricing policy was no more intelligent. The industry raised the price of steel 90 percent between 1947 and 1960 – two and one half times as fast as industrial prices in general – without understanding the impact. In 1971, USS chairman Edwin H. Gott, when asked why his company didn't reduce prices, replied, "We're different. It's not part of our way of life in this country [5, p. 187].

In the late 1960s, steel buyers wanted a firm price promise for several months ahead, so they could evaluate their own operational decisions. The normal practice had been to charge the price in effect when the product was shipped, regardless of when the product was ordered. The domestic mills refused to guarantee the price for the immediate future, so the buyers and importers adopted a wait and see attitude [18, "Steel Summary," Nov. 7, 1968, and Dec. 5, 1968]. By failing to cater to their customers, Big Steel helped open the door to imports.

Another example, Strohmeyer [28, p. 100] writes of Jorgensen Steel, a service center near Philadelphia that originally kept an (unadvertised) File 27 (listing foreign steel for sale). By 1974 they brought this file from under the counter because they could no longer ignore the foreign price advantage. Steel bar shipped from Japan was at least of equal quality and 15 percent cheaper.

Management arrogance of steel producers toward small customers precluded the possibility of the industry differentiating this fairly homogeneous good on the basis of quality of product and service. The American steel management team felt these markets were too insignificant to care about.

A 1980 survey of 100 American firms that purchased steel showed that the decision to purchase steel depended upon price, quality, supply protection, sales attitudes, and various marketing services [1, p. 108]. Foreign producers of steel more frequently catered to niche markets and were more receptive to customers' special needs than domestic producers. Domestic steel quality was criticized and compared with the superior quality of steel found in Japan; quality of service by foreign competitors was also cited, with the number one complaint being the "take it or leave it" attitude found domestically. Also, domestic producers had unreliable delivery. Domestic purchasers of steel found it less of an inconvenience to order the steel in advance from foreigners with the security of knowing it would arrive on time.

Consider quality more directly. Top management did not seem to be aware of the importance of quality and did not know its place in the corporation. "We were content to do what we were doing," said Al Hillegass, who became U.S. Steel's vice-president of steel operations in 1980. "We could sell everything we could make and didn't look for better ways to do it" [15, p. 322]. Quality not only affects internal company operations but also its purchases and sales [18, May 27, 1965, p. 112-114]. Management did not keep pace with the advancements in technology and product quality, and managers who had risen without a technical background were unaware of the importance of quality to the welfare of the firm. This explains why imported steel, with more consistent quality, entered and grew in the U.S. market. Worse yet, Big Steel products faced exclusion from foreign markets, not due to tariffs, but because of substandard quality [18, May 27, 1965, pp. 112-114].

The integrated giants talked about quality, but it was just that: talk. Big Steel failed to accept the fact that radical changes were required. Hoerr [15, p. 323] tells a story about National Steel in 1981. Oil-field customers were complaining about quality, so management said this time they were serious about quality. But when a foreman returned two substandard coils to Gary, he was told he would be fired if he ever did that again.

By 1982, nearly two decades after the quality problem was apparent, the automotive and appliance industries told the firms that their steel was not up to current standards. Big Steel was put on notice that if they didn't reduce substandard steel from nearly nine percent to less than three percent, they would lose the manufacturers' business [28, p. 138]. With these defect levels, one must wonder what attitudes prevailed during the 1950s and early 1960s, when no one seemed able to challenge Big Steel's position. For too long, Big Steel thought of quality and productivity as trade-offs. Fortunately, the two are now considered entirely compatible as domestic mills have responded by lowering prices while offering dramatic quality gains.

Why didn't American steel managers cater to their customers' needs? Perhaps they underestimated their worth to the industry. Perhaps managers didn't have the foresight to see what their competitors were doing in customer and quality relations. Perhaps it was too costly to invest in people at all. Generally, firms who see their customers being taken away react quickly with aggressive

tactics to regain their market share and destroy their opponent if possible. But, these particular firms seemed to feel they could not be hurt by these mini-mill or foreign producers with their low-profit items. Whatever the reason, the industry ignored its customers.

Threat of New Entrants

Another of Porter's categories is the threat of new entrants. We will confine our discussion to two "new" entrants – imports and mini-mills. In the immediate post-war period, Big Steel was indifferent to foreign steel, since it was almost nonexistent. By the late 1960s, the actions of foreign producers were of tremendous importance to the industry, since Big Steel was now a part of a large global industry rather than the dominant factor in a smaller industry. As the foreign producers rebuilt using modern technology, they became much more efficient than Big Steel with its older facilities.

With added production capabilities in the post war period, many foreign countries had more steel to export, and many looked to the large, lucrative market of the United States. Except for a few boom years, these nations were also able to supply the growing demands of their own economies, thus reducing the potential for imports from the U.S. steel industry.

The U.S. management mindset was not only one of arrogance but clearly also one of indifference to the developments overseas. Within a short period of time, the U.S. steel industry lost its position of complete dominance. This decline resulted from rapid steel growth in other parts of the world, particularly Europe, Japan, and Russia and was accentuated by a lack of foresight [or insight] on the part of Big Steel. During the period 1960 to 1969, the Japanese industry increased its output from 24 million tons to over 90 million tons. Russia increased its production from 72 to 121 million tons and Europe, while not quite as spectacular, increased from 80 to 118 million tons in the same period. At the end of World War II, thirty-two nations produced steel. By 1970, thirty-five other nations had started to produce steel, thereby greatly affecting old world trade patterns.

Much of the discussion about foreign steel has centered on increased Japanese production, since they became significant exporters to the United States. They also adopted the BOF technology much more rapidly than the Americans. Two points should be considered. First, both Europe and Japan were expanding, while the U.S. was "rounding out." It is always easier to adopt the best technology if starting from scratch. We made this point above. Dilley and McBride pointed out that the U.S. industry was comparing modified OH costs with new BOF, while other countries, such as Japan, would compare new OH with new BOF. This could well lead to different decisions.

Secondly, scrap is a large input for OH [and also for mini-mills]. The price of scrap was very high in Japan [20, p. 39]. In fact, some Americans were concerned that the Japanese were buying too much American scrap and thus raising the price here. Thus it was the Americans who recommended that the Japanese should invest in the BOF technology.

The pattern of Steel's response to imports makes an interesting story. For example, the price of wire rods increased in each year from 1955 through 1959 and then remained unchanged through 1962. During the price inflexibility, imports of wire rods and related products rose at an average annual rate of over sixty percent. What is curious is that there was a persistent unutilized capacity in wire rods from 1956 on – an excess of close to forty percent. The integrated producers rationalized that any reduction in price they might make would be followed by their foreign competitors and thus prove self-defeating. They also justified their refusal to meet import prices on the grounds that the latter represented sales at less than fair value. In short, there was, no domestic price response to imports [3, p. 626].

While the pedigree for mini-mills goes back to the 1930s, they did not become a serious competitor until the 1960s when the price of scrap dropped. U.S. integrated steel-makers remained confident and optimistic that old patterns would return, so no one paid attention to the inroads of the mini-mills, which initially had a small impact. The rationale was that an individual mini-mill only producing 60,000 tons per year was not worth worrying about. This naive outlook failed to see the impact many of these firms would have, with each of them producing 60,000 tons per year [28, pp. 71-73].

It is often said that the advantage of the mini-mills is cheaper, non-union labor. While it is true that wage rates are cheaper, it is also true that they are more productive than the bigger integrateds. In fact, they produced cheaper steel than the Japanese did in the 1980s. As Barnett and Crandall [5, pp. 21-22] point out, this was not always the case. In the 1960s, their performance was poor, but they have done more to improve productivity than the integrateds.

The higher productivity of mini-mills came about partly because they assumed a short economic life and therefore replaced equipment, always utilizing the latest technology. They were also competitive because they were much smaller, were more geographically dispersed, and therefore had a natural protection because of the high transportation costs that their larger rivals faced.

They have also benefited from cheap scrap and therefore lower energy costs than their American competitors. Since scrap is more expensive in Japan, this again provided an advantage.

Roles of Suppliers and Buyers

We will take a broad view of suppliers and consider raw materials as well as labor. One of the crowning achievements of the large, late nineteenth century firms was their vertical integration. In the case of steel, this meant purchasing all the raw materials they needed. In the early years, it meant that USS got control of the Mesabi Iron Ore Range. This worked to their advantage when it gave only high-grade ore, but proved a detriment after the mid-twentieth century. Management did not rethink vertical integration, but instead developed costly ore fields in northern Canada and made major investments to make use of the low-grade ores that remained at Mesabi. A pelletizing plant built near Duluth in

the 1950s was more than half the cost of the Fairless Works, the only U.S. "greenfield" plant built in the 1950s [4, p. 30]. By 1978-9, investment in iron ore was nearly one-third of the integrateds' investment [5, p. 44]. When demand for steel declined, the American producers cut back on their import of high-grade ores and used their own inferior ores. The result was that the Japanese were buying Australian ores for half the price that the Americans were paying for their own ores [15, pp. 93-94]. The price of coking coal also went down in Japan. In 1965, American coking coal cost $9.65 per ton, more than $4.50 cheaper than the Japanese. By 1976, Japanese coking coal cost $53.60 per ton, but it was $2.40 cheaper than the American coal [5, p. 188].

Another closely studied dimension of the American steel industry's decline is labor-management relations, but discussion often has centered on strikes and labor's unwillingness to give up inefficient practices. The relationship has always been an adversarial one, but it covered all aspects of the relationship, even the symbolic ones. Ben Fairless (a steel-man and President, COO, and CEO of USS between 1938 and 1955) and the United Steel Workers of America leader David McDonald often toured the plants in the early fifties in an endeavor to forge peace between the two groups. But Roger Blough [a lawyer and chairman 1955-1969] brought a different attitude toward labor-management relations than his predecessor. Blough's philosophy was that management and labor should remain separate entities. According to one union leader, "Blough is a man you don't get to know much about. He stays in his ivory tower."

Our argument, following Pfeffer [24] is that management gets the kind of labor relations and labor leaders that it deserves. Management sets the tone between supervisors and employees. If management is open and treats workers with dignity, it will find it has a good labor force; if it treats labor as stupid and replaceable, it will force the union to elect representatives who will oppose every management initiative. Pfeffer concludes that "the effects of unions [on productivity] depend very much on what *management* does [24, p. 163]. Overall, he argues with many examples, firms which treat their workforce well have a competitive advantage and are highly profitable. Recent work by Reichhold [26] and also Collins and Porris [11] point to the importance of mutual accommodation and respect between labor and management.

Instead, the attitude prevalent in steel firms was that "management manages the business and the union grieves." Management failed because it did not change its autocratic style of managing people in order to gain cooperation in a common endeavor for the industry. Orders were to be followed to the letter. Management was too arrogant to see that labor could contribute ideas that might halt the decline. Ben Fischer, director of Labor Studies for the USW, echoes Pfeffer's idea:

> It must become part of the management structure, to help secure the success and position of the firm as the thing most meaningful to the worker. There are two reasons for the union to have a role in management. One is that the union has a better capacity, or should have, to know what's best for workers. The other is that it

> gives management a good channel for relating to the work force. Management and the union can manage the work force more effectively than management alone can [15, p. 36].

The structure of the industrial relations system in this industry failed to take advantage of the ingenuity of its employees. Autocratic management style resulted in narrowly defined functional jobs, alienated workers, poor quality, and lagging productivity growth, not to mention growing hostility in management-labor relations. Management believed workers were disposable; after all, anyone could follow orders. Apparently management didn't wish to learn from its workers either [28, p. 222]. One subsidiary executive once said: "I have always had one rule. If a workman sticks up his head, hit it" [15, p. 47].

Tom Graham was appointed USS's vice-chairman in 1983. His program was to end the "civil service mentality." One manager, who had worked there since the 1950s, was bitter about the "lack of human concern." He continued:

> U.S. Steel has always been highly politicized. The higher you go in management the less they listen. The management style didn't change when Graham came. Still the blatant arrogance and not confiding to people with truth and openness. Graham is an autocrat, and he listens to no one. If you speak up to him, give him your best judgment, you're gone [15, p. 429].

The industry also suffered because of "declining" work force quality. Seniority had been established in the 1930s to prevent nepotism and other forms of favoritism. This had worked quite well until the 1950s when retirements brought new people, who were not always as good as the departing executives, to key positions. The attitude of new managers also contributed to the problem, since they no longer wanted to get their hands dirty. Foremen no longer believed it was their responsibility to understand each operation [15, p. 309].

The increasing difficulties facing the industry should have galvanized labor and management to focus on their mutual interests, but instead each blamed the other [and the government]. The union, like management, failed to adapt to a changing environment. In fact, both management and labor established a cocoonish industrial relations system that tended to ignore the outside world. Unions demanded increased wages and, after resisting, maybe even taking a strike, steel gave the raises and immediately raised prices. Higher wages based on higher productivity was not considered by either side.

The U.S. steel industry was, in effect, hurting itself and the economy as a whole by maintaining this hostile form of labor relations. This demand volatility during contract years hampered steel operations following settlement. The disruptive nature of steel strikes on the manufacturing sector caused steel buyers to hedge by increasing their inventories of steel prior to the strike deadlines. Steel demand was low following contract settlements, as buyers ran down their inventories.. Therefore, demand fluctuated wildly during contract years and tended to cause imports to surge [4, p. 69]. The history of the fluctuation in demand also led the steel industry to underestimate the developing surge in

foreign imports, particularly in 1959, because they felt that what they were witnessing was just the normal running down of their buyers' inventories that had been run up in anticipation of a strike.

Mismanagement, sloppy work practices, and waste were quite common at the large steel mills. The magnitude of these inefficiencies was also quite significant. When profits began to dwindle, efficiency checks were undertaken in an attempt to get a handle on costs. An efficiency expert at Bethlehem Steel felt that mismanagement and waste were bigger causes for the steel company's problems than imports [27, p. 128].

Finally, it has often been argued that the famous Clause 2B in the 1956 labor contract was a source of serious problems for the industry. The provision stipulated that established labor practices could not be changed unless there was a change in the underlying conditions, except by negotiation. However, it might be argued that 2B was necessary because of past management practice. Furthermore, "2B [might] provide an incentive to management to introduce new technology as a means of increasing productivity [15, p. 327]. In any event, the impact of 2B is not simple to interpret.

To conclude: What went wrong was management's complacent and rigid attitude. Success was enjoyed without an understanding of its cause, or the necessary measures required to sustain it. Management thought that they had the best industry in the world in the 1940s and early 1950s. But the key to industrial success is not arrogance, it is a belief that success is not always guaranteed. Having no problems is always a problem. What worked yesterday was thought to work just as well tomorrow. Management was only concerned with whether profits were made [18, July 23, 1959, pp. 29-31], and it seems global competition was not relevant to these firms at this time. This paper has emphasized that the 1950s was a time when the right changes could have been made. Interestingly, Hoerr [15, p. 297] finds a surprising unanimity that worklife began to deteriorate in the early 1960s. In other words, no one had learned from the 1950s.

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