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**Center for
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**Fatal Industrial Visions: Correcting
Tunnel-Vision for Long Term Survival in
a Global Economy**

**CEO Publication
G 86-11 (89)**

**Ian I. Mitroff
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It is no accident...that work-force management in America has developed the way it has. The gradual evolution of a single, dominant paradigm for production and, for much of this century, the success it has enjoyed in the market have driven home to many managers the apparent validity of the assumptions upon which that paradigm was based. If skills can be progressively built into machines, then workers need not be especially skilled themselves. If a production system is to run economically, all considerations must be subordinated to the achievement of continuous high-volume operations. If costs creep up too far, turn up the pressure on workers or cut their pay or both. In short, follow the gospel of "volume above all else" with an unblinking faith in its ultimate rightness, get skilled people out of the system wherever possible, automate everything in sight, gear up for long production runs, buffer yourself with enough inventory to keep the lines moving, inspect for defects--if at all--at the end of those lines, treat workers primarily as a reservoir of costs that can be bled out under pressure as the need arises, and you will boost your market share, your profits, your stockholders' good disposition, your bond ratings, your own compensation, and the nation's industrial health.

William Abernathy, et al.,
Industrial Renaissance. 1

...the U.S. steel industry's underlying assumptions about the steel business prevented it from making the aggressive investments in modernization that were needed to match the pace of Japanese investment. From the U.S. company's point of view, the discounted cash flow return from a new low-cost...mill could not justify its construction. Levels of debt as high as [those] in the Japanese industry were unthinkable. Since no attempts were made to export in large quantities, growth rates were too slow to justify large additions to capacity. The investments the companies [made]...left the U.S. less competitive than [when]...modernization started.

Ira C. Magaziner and Robert B. Reich,
Minding America's Business. 1

In certain, key respects, individual companies are like people. In Western societies at least, individuals are supposed to have a separate, independent existence. As a result, they are supposed to be both responsible for their own actions and understandable apart from the larger social fabric of which we are all a part. In the strict sense, this is impossible. All of us are part of a larger social collective from which we derive our fundamental sense of identity, meaning, belonging, and even daily existence. In this sense, individual firms are like the individual members of a family. Neither the indi-

viduals themselves nor the entire family exist or can be sufficiently understood apart from each other. What it has taken family therapists decades to learn, namely, that one can neither successfully identify nor treat the "truly sick" members of a family without diagnosing and treating the whole family, we are just beginning to appreciate applies to whole industries as well.

Thus, to understand an industry, like the automobile for instance, it is not enough to understand the assumptions that made for a particular company's success or failure. In addition, it is necessary to go beyond the particular assumptions that govern any specific firm in an industry to comprehend the assumptions that shaped them all. These additional assumptions reveal what they share in common. As such, they are akin to the culture of an entire industry. That is, if individual companies have a set of rarely articulated but deep beliefs and basic assumptions which guide their behavior, then whole industries also have a set of rarely articulated, deep beliefs that guide their behaviors as well. Looking at these additional assumptions, basic beliefs, and values helps us to gain deeper insight regarding what's required to change if we are to revitalize our basic industries and if American industry as a whole is to compete successfully on what is now a global economy.

The job of understanding any particular industry is horrendous and complex enough that it is doubtful that it could be accomplished in any single book, let alone in a single paper. The job of understanding and comparing whole industries is thus even worse, if not infinitely so. It would thus seem that our task is doomed from the outset. And it is, depending on what we mean by "understanding" and "comparison."

In this paper we primarily want to understand and to compare two industries, automobile and steel. It should be obvious why we choose these two. They are two of our oldest and most basic manufacturing industries. One of them, automobile, has a real chance of making a comeback; the other, steel, does not. Thus, if we can understand what went wrong with both of them, and further, why one of them, the automobile industry, seems capable of turning things around, then we can begin to form a bigger picture of what's required of all industries in order to survive in today's globally competitive environment. In short, we can use both of these industries as a baseline to make comparisons with a much larger array of more varied industries.

One way to make the task of understanding whole industries manageable is to take the excellent but by now overwhelming volume of studies, whether in the form of papers, reports, books, and reduce them to two tables.² These two tables, one

for the automobile industry and the other for steel, summarize what we have gleaned from all we've read plus our own experience in consulting with individual companies in these industries. The summaries take the form of two lists of approximately twenty key assumptions per industry.

Now no one, least of all us, contends that two tables of twenty or so short assumptions is sufficient to capture the nuances of any industry. Such an assumption, if we were making it, would be as absurd as it would be patently false. What we are contending is something quite different. These two tables are sufficient to give one insight into, or better yet, a "feel" for the many factors responsible for the directions that both industries took in the U.S.

Because of the extreme critical nature of our examination, a few more qualifications are necessary before we give the results of our findings. Many, if not most, of the assumptions in both tables were never fully or explicitly articulated, and certainly not in the form in which we have stated them. Most of them were implicit in the behavior and policies of the industries as they developed. Indeed, in many cases they can only be gleaned clearly from the vantage point of the present.

Further, the reader must be warned explicitly that as each assumption is worded, each has the appearance of an

"absurd proposition." This is not only because what was reasonable for earlier times is now absurd or completely out of touch with today's world, but because we have deliberately worded each proposition to make its absurdity clear beyond any doubt. Actually, in each case we have supplied two wordings. The first which we label "generic" is our "no-holds-barred" translation of what we take to be or to have been the underlying spirit of the assumption governing a particular aspect of the industry we're examining. The second or "historic" expression is closer to the more neutral or scholarly wording of an assumption as it appears, in some cases almost verbatim, in the academic literature.

Finally, it must be strictly understood that because the mere wordings of the assumptions themselves reveal our extreme criticism of both industries, it should not be construed that we are totally without sympathy for either of them. We doubt that we or anyone else could have acted completely different at the time these two industries were born and became so successful. The case now however must be different.

If we are overly critical of both industries, it is for the purpose of helping us learn to avoid similar such mistakes in the future. One can excuse such mistakes the first time around. But the nature of the worldwide competition we now face is such that we no longer have the luxury of not learning,

and faster than ever before, how to correct past mistakes and how to design new practices that will avoid future ones.

The Glorious Birth, Maturity, Decline and Hopeful Signs of Rebirth of the American Car Industry

Table 1 lists what we take as the principal assumptions that guided and governed the American auto industry from its birth or inception to relatively recently. Despite the complexity of the industry and its long history, we would not have the confidence we do in reducing that complexity and history down to a limited number of assumptions were it not for some essential facts. For one, the same, small number of basic themes emerge repeatedly from all of the major accounts on the history and nature of the industry.³ Furthermore, in many cases, the general tenor and tone of these accounts is as strong and as critical of the industry as the assumptions which we have listed under the broad rubric of "generic rules or assumptions."

The earliest years of the American car industry were marked by the kind of intense, fierce competition between large numbers of small firms, often no more than homespun, garage affairs, that typifies most industries in their beginning or start-up phase. Thus, by 1900 there were some fifty-eight "firms," if they could be called that, selling "cars," if the

Table 1

The Unwritten Rules of the American Automobile Industry

Generic Rules

1. An easy, short childhood is the best preparation for adulthood and maturity.
2. We are stable now and forevermore; the broader world is stable.
3. "They love us" (i.e., our products); they're loyal; won't switch; we can take them for granted; we can assume consumer stability.
4. Nothing new will be invented that will radically shake up our product; we essentially know it all; the stability of car technology can be taken for granted.
5. Our focus need not be broader than the driver; a restricted focus of innovation can be assumed.
6. Don't change until forced to; resist, deny change; put your major energies into denial and resistance.

Historic Rules

It was a distinct advantage that by about 1930 the modern car industry was firmly established, its competitive practices well-understood, its major product design features firmly locked into place, etc.

The external environment of car-making is essentially stable and well-known.

The tastes of U.S. car-buyers are standardized and stable; thus, except for yearly styling changes, we do not have to make radical or substantial changes in our product; as a result, U.S. car-buyers will not demand a new type of car that we have never built in large volume before.

The design/production of future cars will not require fundamentally new manufacturing processes or technologies.

Innovations relating to driver comfort are more important than fundamental technical innovations in the basic product.

We can succeed by not spending money on fundamental innovations until forced to by governmental regulatory agencies, foreign competition, consumers, etc.

Table 1
Page 2

- 7. Get your priorities wrong; innovation can take a back seat to efficiency.
- 8. Keep getting your priorities wrong; good labor relations can take a back seat to efficiency.
- 9. We're so big and powerful, smug and secure that we can shut out the whole world; we can charge and pass on anything we want to our customers; so what if we're arrogant?
- 10. Since we don't need much innovation, we can finance whatever we want to.
- 11. Managers don't need challenge in their work; the restricted focus/nature of managerial work can be assumed.
- 12. If you want to get tunnel-vision, then you have to reward it; we are masters at creating a system for producing managerial myopia.

Because of G.M.'s dominant industry strategy (under A.P. Sloan) based on clever marketing to different demographic segments of the population and frequent style changes, technical innovation was subordinated to efficiency in production; i.e., efficiency is more important than innovation.

Efficiency in production is more important than good labor relations; good labor relations are not important to efficiency.

Foreign competition will never be significant; therefore, U.S. car-makers will not be prevented from passing the higher costs of production necessary to keep up with the competition onto consumers.

The capital and debt capacity required to finance whatever innovations are required will be readily available.

As the business of car-making became well understood, managerial work not only became routine but it was desirable that it became so; the challenge of managerial work was not necessary to the long-term success of the industry.

An extremely handsome bonus system that rewards top management for short-term thinking is not hazardous to the long-term interests of the entire industry.

13. Workers don't need challenge in their jobs; the restricted focus/nature of all jobs can be assumed.
 14. Keep every one small-minded and uninvolved.
 15. Don't rock the boat; don't bite the hand that feeds you; these rules thus pertain to the unwritten culture of the industry.
 16. We don't have need of constant informal parties as they do in Silicon Valley.
 17. We've discovered the principles of organization for all time.
 18. No one including ourselves can teach us anything about good organization; we resist learning anything even from ourselves.
- Workers are willing to trade money for challenge in their jobs.
- It is not necessary to engage the involvement of most employees in the larger purposes of the business.
- It is not in the interests of top management to tamper with the system that has promoted them; it is not necessary for top management to look at the big or whole picture.
- It is not necessary to breed/foster an industry-wide culture of innovation, intense competition between companies, informal sharing of information, entrepreneurialism, and the intense cycling of executives between firms.
- The organizational structure of U.S. car-makers is not only appropriate for its time, if not all time, but it is well-suited to responding to changing governmental policies, consumer tastes, and foreign competition.
- Despite G.M.'s great success due to its early organizational structure under Alfred P. Sloan, Ford was correct to resist the professionalization of its upper management for so long, and Chrysler was correct to resist adopting G.M.'s structure of high differentiation and high integration; in other words, U.S. car-makers had nothing significant to learn from one another regarding the design of their respective organizational structures.

earliest "vehicles" could be called "cars." By 1910, there were more than two hundred such start-ups.

The reasons for the explosion in start-ups are not hard to fathom. In the early years, the basic costs of assembling a car were low, if not almost nonexistent. Literally almost anyone could scrape together the necessary small amounts of capital required to assemble a car in a back yard garage. Survival, however, of the multitude of small firms was another matter as the novelty of early cars began to wear off. As a result, nearly all of the early start-ups have long since passed into the pages of American history. Their names however still beckon us with nostalgia back to an earlier, simpler era: Stanley Brothers, General Electric, Maytag, Sears, Harvard, etc.

As the industry grew rapidly, it became impossible for the vast majority of these small firms to remain in business. For instance, by 1908, the top three producers--Ford, General Motors, and Studebaker (which then marketed under the label EMF)--accounted for approximately half of the U.S.'s total production of cars. By the end of the 1920s, the seven largest firms accounted for more than 90% of the market.

Again, the reasons for the shakeout are not hard to understand. One, a recession in 1920 and 1921 wiped out most small firms. Two, the overall demand for cars dropped off sharply in the '20s so that car makers found themselves in

strong competition for the same basic contingent of customers. Three, with their decisively greater economies of scale achieved through mass production, large firms could offer bigger, closed-roof cars and for much lower prices than small firms could.

Perhaps what in the long-run was to prove most decisive was that by about 1930 the basic structure of the entire industry was locked firmly into place. Thus, the basic design of cars and the basic technology for producing them became fixed. For all practical purposes, American cars became synonymous with bigness, luxury, and driver comfort. They were easy to drive and featured simple technology that made few demands upon driver skills. It was in short an industry and a product that was oriented to making minor technical advances and to featuring annual model changes that revolved mainly around styling. It was not an industry oriented to making and introducing radical changes and innovations in either the product or in the technology for producing it.

Additional historical facts only support even stronger the main pattern. Thus, with the addition of automatic transmissions in the 1940s, the basic, dominant design of cars that was to hold the industry in its sway for the next thirty years was completed. Since the basic technology of cars was locked in place so early on, the major firms competed with one

another mainly on the basis of styling and such amenities as dealer service, and not on basic differences in technology. Further, given the dominant design and basic processes for producing the kinds of cars the industry made, it cost as much to design and to produce a big bolt as it did a small bolt. Since what was true for a bolt was true for all other components, it therefore cost as much to produce a big car as it did to produce a small car. But this meant that the profits for big cars were considerably greater than for small cars since psychologically one could charge customers more for big cars. Further still, since gasoline was essentially cheap all during the long period of the industry's heyday, this meant that both consumers and producers became habituated to big cars. In effect, both the industry and consumers became addicted to a product that was only suited, at best, for one, very special set of conditions, although they lasted for so long as to make them seem natural, inevitable, and enduring. Because the industry very early on crystallized around the design of mass produced, big cars, it locked into place manufacturing facilities that in effect made the production of big cars cheaper than small ones. It was not, as it certainly is not the case today, that big cars are inherently cheaper and more profitable to produce than small cars. Rather, we locked into place the kinds of manufacturing processes and factories

that inherently tilted the odds in favor of the production and consumption of big cars as opposed to small ones.

World War II only reinforced the implicit tendencies and biases of the industry even more. Given the pent up demand for cars, the consumer market after WWII was essentially a seller's market. Consumers were hungry for and hence gobbled up literally anything that was thrown at them. Further, the internal U.S. domestic market was so big that for all essential purposes the market for American cars was the U.S. With little harm therefore, the U.S. car companies could ignore the rest of the world.

All of this is background and testimony to the first ten assumptions in Table 1, if not all of them. Given the preceding discussion, the wording and intent of the assumptions should be clear. The only one that might conceivably require modification is the first one. If the "very early childhood" of the U.S. auto industry with its intense competition and recessions was not as mild, easy, and protected as assumption one makes it appear, then certainly its "teen" or "early adult" years were. Thus, the intent of the assumption is clear. Once the initial survivors made it past the trauma of the birth or start-up years of the industry, they seemed virtually assured of immortality, or so it seemed for a period of some forty to fifty years. Now, while forty to fifty years is an insig-

nificantly small time from the standpoint of geologic history, it is a comparatively long period of time from the standpoint of an individual's lifetime within a particular industry. As we have painfully had to learn, forty to fifty years is more than enough time to instill the conditions for the "failure of success," i.e., the erroneous belief that one can repeat blindly in all times and circumstances the assumptions that made one successful for one very special set of conditions. As Abernathy and his colleagues put it:

...The market for automobiles after World War II was a seller's market and the domestic producers flourished. Increases in costs were readily passed along to the consumer, whose appetite for fins, chrome, and horsepower appeared insatiable. Success bred success and confirmed the managerial decisions responsible for it.⁴

The U.S. auto industry did more than ignore the rest of the world. It believed it was invulnerable to the penetration of its internal markets by the outside world. Thus, not only did the industry believe implicitly in an assumption like number nine, but as is always the case, there were other only partially articulated assumptions that tied in and supported it, for instance: "(1) We're shielded from imports ever gaining a significant toehold in the U.S. market because (2) the

rest of the world can't establish the domestic dealer outlets and support networks for parts, service, and financing that we've established over the years." As was the case with all the assumptions of the industry, these were to prove false as well during the 70s and 80s. Thus, for example, the VW bug not only proved to be fun and economical to drive, but VW quickly established to the dismay of domestic producers an elaborate dealer network which offered high quality service and customer support. In short, all the assumptions that made for success during early phases of the industry made for its failure during later phases.

If forty to fifty years is relatively a long time in the history of an industry, then ten years is also relatively a short time for the basic character of an industry to change almost completely. Indeed, it feels as if almost overnight the entire character of the U.S. auto industry, if not that of the industry worldwide, has changed completely. Where once all cars were oriented towards smoothness, ride, passenger comfort, luxury, and quiet, they are oriented now to fuel efficiency, quality of construction, and reliability of operation and ease of maintenance. To achieve success in today's market one must combine low price with high perceived performance and quality. The change is thus so fundamental and so basic that it has taken what has seemed like an inordinate amount of time for

Detroit to realize and then to respond to the fact that today's cars are an entirely different breed altogether. Wedded to old ways, some in Detroit still have not gotten the message and probably never will. The reasons for this have to do with the additional assumptions in our table.

Building an entirely new kind of car demands more than a different attitude towards innovation, new technology, plants, equipment, and financing. It demands as well the development of entirely new attitudes towards workers, middle managers, and even top managers themselves. The Japanese have learned one essential and critical lesson among many: it is impossible to build good quality products without the active participation, intense cooperation, and deep understanding of the total labor and management force in the final, end product and the entire manufacturing process for producing it. But this means that workers and managers alike must be involved in understanding EVERY phase of the total design, manufacturing, marketing, and even financing of cars. This in turn means that workers and managers alike must be considered as an integral part of the manufacturing system. As Abernathy and his colleagues put it so rightly and so well, the work force must be viewed as something to be nurtured, not as a thing which is merely bought and sold.⁵ To view labor and even management in a different light, however, means overcoming the horrible and long history of poor

relations between labor and management in the automobile industry.

As the profession of organization design has learned from decades of research and practical experience, changing any human system, whether it be an individual firm or a whole industry, demands changing a number of factors, not one or two. At least six key variables are involved in the design and operation of any organization: (1) the organization's formal structure; (2) the kinds of people it hires, their skills; (3) the nature of the tasks or jobs they perform; (4) the kinds of rewards they receive; (5) the kinds of information the organization collects and how it disseminates it; and (6) its culture. Again, the Japanese have learned key lessons that cut across all these variables at once. For instance, they have learned that if you want to build a better car then you have to make as many problems that will potentially compromise its quality as visible as is possible. But this means that you have to construct an organization that will recruit, train and explicitly reward its members for raising problems up to the surface, for solving them, and not in hiding or avoiding them. You certainly can't reward them for attending only to the short run and for not seeing the big picture.

If one looks across all eighteen assumptions, one finds that they fall into a small number of distinct groups. First,

there are a set of assumptions that relate to the historical circumstances of the relatively easy birth, childhood, and early adulthood of the industry. Because the industry was born and grew to maturity in relatively easy circumstances, it naively and wrongly assumed it would always exist in relative comfort. It mistook an accidental circumstance of history for a natural and permanent occurrence. In short, it made a false assumption with regard to continuity of the external environment: things always will be good because they always have been.

Second, the industry assumed and hence took for granted the loyalty of their consumer base and the unchangeability of their tastes. It thus made a highly critical assumption with regard to one of their major stakeholders, their customers. Third, it minimized and discounted the need for constant innovation, and its adoption into the working design of cars, before innovation was forced upon them by foreign competition. It thus made a further assumption with regard to its prime stakeholder, i.e., that its customers would be satisfied with whatever it gave them. And it made an additional assumption with regard to another important stakeholder, i.e., that foreign competition would never be powerful.

Fourth, it assumed that labor and management, two other important stakeholders, did not need jobs that were challenging and forced them to see the whole or big picture. As a result,

fifth, it is not surprising that both parties assumed they could shut out the rest of the world and hence narrow their vision. Sixth, both sides assumed that as the basic design of cars was fixed so was the type of traditional, hierarchical, bureaucratic structure needed to produce them. They thus made a critical assumption about the kind of organizational structure needed to manufacture cars. Finally, seventh, the members of the industry basically assumed that they had nothing to learn from one another regarding basic organization design or to gain from intense competition between them.

The final, end result was extreme isolation and insulation from the rest of the world, a cocoon like mentality and existence--tunnel-vision of the worst kind. Thus, whether intentionally or not, the industry had in effect concocted a system that prevented learning from both the outside world and its own inside world. It even went so far as to reward explicitly, and rather handsomely at that, both workers and managers for being myopic. One couldn't have done better if one had intentionally designed a system for producing the effects that resulted.

Such systems are almost impossible to change. The very rationale for their existence becomes the denial of external warning signs that signal an abrupt change in the outside world. Such systems feed off of and perpetuate their own

closed view of reality. It becomes therefore nearly, but not completely, impossible to change them. For these reasons, mild shocks or portents of change are not sufficient to accomplish significant change. The signals have to be massive, sustained, and clearly undeniable if they are to penetrate the wall of self-perpetuating unreality that has grown up over the years. Thus, the earnings of the major American car companies not only had to go into the red once, but they had to stay there for several quarters in order for the message to sink through to executives and workers alike that things were never going to return to what they had been. Since both managers and workers had built a system for living in the short run, they had to be hit in the only place where it would get through to them that things were clearly different, i.e., on short run measures of performance. Thus the overly handsome bonuses of top executives had to dry up and the jobs of workers had to be threatened on a scale that they never had been before. This is the only way that an unpleasant message could possibly sink in.

However, there are real and positive signs that the U.S. auto industry has not only gotten the message that everyone of the assumptions and practices by which it has lived are no longer appropriate but that it is actively doing concrete things, namely the Saturn experiment, to reverse the old order of things and to usher in a new one. Whether it succeeds or

not, G.M.'s Saturn experiment is highly significant for it is based on a complete reversal of every single one of the assumptions in Table 1. This is highly important in itself, for whether G.M. has consciously realized it or not, the only thing that can save an organization once nearly every one of its major operating assumptions have collapsed is by means of a program of organizational renewal that is based on the deliberate and systematic abandonment of every one of its old assumptions. It has no choice but to forge new strategies deliberately and systematically based on the reversal of every one of the old assumptions that got it into trouble. And it can't do it either piecemeal or timidly. It's got to embrace change dramatically and boldly. This is the lesson, promise, and hope of G.M.'s Saturn project whether it succeeds or not. The lesson is that the U.S. automobile industry--the entire world's, period--is never going back to what it was. As a result, we predict that whether Saturn succeeds entirely or perfectly, it will be the stepping stone for the survival of the entire industry. To this end, enormous credit must be given to Roger Smith, G.M.'s C.E.O., the most improbable of characters to lead stodgy G.M. out of its doldrums. He has combined precisely the elements that are absolutely essential if one is to reverse the disastrous set of conditions into which the industry had fallen: (1) clear and dramatic leader-

ship, (2) organizational innovation on precisely the level and scope on which it was needed, and (3) a reversal of all the assumptions that were responsible for its "failure of success" in the first place.

Finally, for an entire industry to learn and to change, innovative experiments must spread across most of the firms in it simultaneously. Otherwise, a critical mass or a new culture of innovation will not take hold. Thus, it is not enough for a Saturn experiment to take place in one company; similar experiments must take place in others as well. And there is evidence that such is the case. Both Ford and Chrysler have announced their intended versions of G.M.'s strategy of buying electronic, information companies to help them automate their factories to cut manufacturing costs; both are also experimenting with different compensation and profit-sharing plans to motivate workers and managers alike to see the larger picture, to promote involvement, and to provide a real incentive to cut costs, increase profits, and a concern for international competitiveness through a greater emphasis on quality.

The Birth, Maturity, and Decline of the U.S. Steel Industry

Unlike the U.S. auto industry, the U.S. steel industry does not show signs, however weak and blurry they might be, of recovering. Unlike the U.S. auto industry, the steel industry

appears permanently trapped in its outmoded view of the world, i.e., its assumptions.

Given our discussion of the auto industry in the preceding section, there is no need to repeat in detail the particulars of the steel industry's history. It is not that its history is identical to that of the auto industry but that given the discussion of the U.S. car industry, it is not necessary to discuss its history in detail in order to understand the assumptions in Table 2. The following passages from Magaziner and Reich are more than sufficient to provide the necessary brief background to interpret the assumptions in Table 2:

In the 1950s, U.S. steelmakers produced almost 50 percent of the world's steel. They had the world's largest, most efficient steel-producing facilities. While the U.S. had the world's highest wage rates, it was the world's lowest-cost producer of steel, and the world's largest exporter. The combination of high productivity and access to good, low-cost raw materials gave the U.S. a significant competitive advantage. Today, the U.S. produces only 16 percent of the total world steel output and exports less than one-tenth of the amount exported by the Japanese. Imports took over 18 percent of U.S.

Table 2

The Unwritten Rules of the American Steel Industry

Generic Rules

1. Steel is a simple business.
2. Steel is and always will be a good business
3. Because of the essentially simple nature of our business, there's essentially just one way to organize.
4. An easy childhood is the best preparation for adulthood and maturity.
5. The best way to face the future is by looking back and staying rooted in the past.
6. We're so big and powerful, smug and secure that we can shut out the whole world; the rest of the world isn't even worth a fight.

Historic Rules

- Steel-making is and always will be a straightforward, i.e., non-complex, business.
- Favorable environmental operating conditions for the steel industry are not fleeting but permanent.
- Highly centralized, functional, bureaucratic organizational structures were appropriated for U.S. steel companies because of the straightforward nature of their business.
- The relatively placid environment in which the U.S. steel industry was born and the subsequent long stability of that environment was favorable for the long-term survival of the industry.
- The best way to protect the U.S. steel industry is to freeze production and investments at past levels, i.e., the best policies for the industry to pursue are defensive, reactive strategies based on the past.
- The industry can be successful by concentrating only on domestic markets; conversely, we can afford to give up foreign markets without much of a struggle or sacrifice.

Table 2
Page 2

7. We're so big and powerful we might as well just be one company anyway.
 8. We're OK; everyone else is not OK; get the outside world off our backs; who do they think they are?
 9. Fight outsiders to the death; never give an inch.
 10. Avoid, deny, resist instead of adapt, learn, mature.
 11. We don't need to learn how to produce more efficiently.
 12. Since we don't need to learn how to produce more efficiently, we don't need any competition to prod us.
 13. We don't need to strive for excellence generally; conversely, we can get by with restricted excellence.
- The essential dominance of one company, the U.S. Steel Company, was good for the entire industry.
- The misfortunes and troubles of the U.S. steel industry are due primarily to outside forces, e.g., unfair trade practices, government interference, high labor costs, etc.
- It is important to spend considerable time and money fighting government policies that one has little hope in changing instead of seeking compromises with those policies and in learning how to adjust to them.
- The steel industry can successfully meet whatever crises it faces through strategies of crisis avoidance, e.g., through diversification and mergers, instead of through fundamental organizational innovation.
- Maximizing the efficiency of production is not necessary to the long-term survival of the industry.
- A level and kind of competition that would have forced the maximization of efficiency was not necessary to the long-term survival of the industry.
- It was not necessary to pursue excellence in either innovation or efficiency.

14. Bigger is more important than the quality in innovation.
15. Bet your money on the past and present, not on the future.
16. Invest small in innovation; don't borrow to invest in innovation.
17. Keep everyone small-minded and uninformed; tunnel-vision is the best policy for everyone.
18. Everyone can have any job they want as long as it's at the bottom.
19. No one else has anything new to teach us.
20. Stay put; we practice not-invented-here by deliberate intention and careful planning.

Increasing the volume of total steel production by building bigger manufacturing plants is more important than the introduction of newer, possibly smaller, steel plants that feature revolutionary steel-making techniques; i.e., volume is more important than innovation.

Investment capital should be spent mainly, if not solely, on the expansion of existing plants rather than on cost-saving innovations.

Whatever innovations are required can be financed solely through internal funds.

It was not necessary for either top management or union leadership to involve the workforce in the larger issues of the industry.

As an industry, we can afford to have rigid, traditional patterns of recruitment, i.e., essentially one entry level position at the bottom.

It is not necessary to recruit potential managers at the major schools of business or to bring in outside managers.

It is expected that top managers will have spent their entire careers in one company.

consumption of steel in 1978 before barriers were erected to limit them.

Declining productivity in the steel industry has had a wide-ranging impact. U.S. producers of automobiles, appliances, ships, and other steel-using products have been put at a serious disadvantage by having to buy higher-priced American steel. In 1977 and 1978, companies manufacturing cars in the U.S. had to pay 25 to 30 percent more for their steel than did their Japanese counterparts.⁶

...U.S. steel companies made small, incremental investments to obtain "cheap" capacity rather than make the larger, more aggressive, and riskier investments that could have led to superior productivity overall. In fact, because of its high capital costs, the Bethlehem Steel plant at Burns Harbor, Indiana, was long viewed as unprofitable, even though it is the only fully integrated large-scale greenfield plant built in the U.S. since 1952. Overall, U.S. steel companies have sought to keep the return on investment--ROI-- up by keeping the "I" low, but this strategy has left whole plants uncompetitive. In the long run this scheme has been self-defeating.⁷

During the early 1970s, [the] lack of understanding of market development and of competitors was a serious problem in the U.S. steel industry. A reasonably small circle of "industry experts" and company leaders had set up a fairly insulated and mutually reinforcing mythology about the strength of the American steel industry and the vulnerability of the Japanese steel industry, if stripped of its "unfair trade practices." Business leaders spent too much time worrying about unfair trading and the need to diversify investments instead of planning investments to reassert technological and productivity leadership.⁸

Inspection of Tables 1 and 2 reveals that they are essentially the same. One is reminded of Tolstoy's famous saying that each happy family is happy in its own distinct way but that all unhappy families are alike in their unhappiness. Nevertheless, there must be subtler differences between them if the auto industry has a chance however debateable of recovering but it appears that the U.S. steel industry has lost forever whatever chance it once had for recovery. As we see it, there are two outstanding differences between the two industries. One, no leader of the stature of Roger Smith, G.M.'s C.E.O., has emerged in the steel industry who is, two, willing to stake

his company's entire fortunes on a major organizational experiment of the magnitude of Saturn. Third, no leader seems willing to make the investments which are required to buy a Hughes aircraft company. A Hughes is necessary if one is to have the technological infrastructure necessary to support a Saturn. Or to put it slightly different, in order for any industry to survive today--and we definitely mean any industry--a major leadership effort needs to be mounted towards explicitly challenging and reversing the primary assumptions on which the old ways of doing business were founded. Secondly, it is not enough merely to challenge assumptions. Challenging is necessary but not sufficient by itself. The challenged assumptions must only be replaced by new ones, but they must be replaced in a way that is clearly visible to all else the entire effort will merely remain abstract and academic. That's why a concrete, highly visible, and significant experiment is vital. It not only makes the new order of things visible but it shows as well the commitment of the organization to change and in such a manner that everyone can see for themselves what they are changing to. To paraphrase a well-known saying of the great German philosopher Immanuel Kant, surfacing and challenging one's old assumptions without a concrete design in which to ground the new assumptions is an empty, sterile, and intellectual exercise at best. On the other hand, designing and

executing a concrete experiment without challenging past assumptions can be narrow and short-sighted, i.e., not well-thought out and hence not well-suited to what's required.

Concluding Remarks

We believe that the conclusions we have derived from an examination, however brief, of these two industries generalizes to all industries. While industries obviously differ greatly in the nature of their products, their organizational characteristics, capital and information requirements, the nature of their dealer support systems, etc., two things are absolutely essential for survival in today's environment: (1) the clear recognition and understanding of the role that past assumptions have played in the operations of the industry; and (2) continuous experimentation with new forms of organization for producing and institutionalizing innovations in one's products. Those industries that clearly understand these two principles will survive; those that do not, will not.

It should be noted that these two principles apply irrespective of the size of individual firms within an industry. Thus, it may well be that the U.S. steel industry will survive because of the growth of new, small innovative firms, and not because of old, large firms such as the U.S. Steel Company. Newer firms have definitely discovered a niche for themselves by producing specialty steels. They have also incorporated the

latest steel producing technology in mini-mills. Further, they have an entirely different appreciation and understanding of the needs of the people who work for them. In short, it appears that they are succeeding through their reversal of every one of the assumptions in Table 2. Thus, the new steel industry composed of small, high tech steel companies may well make it. Again, the point however is that it's a new steel industry. The old one seems dead.

As we indicated in the introduction to this paper, we can not of necessity undertake an examination of every single industry in the U.S. in order to assess its particular chances for survival. We can however point briefly to a few industries, and by showing how they are faring with regard to our two principles, thereby evaluate their chances for survival.

The health industry in the U.S. appears that it will not only survive but prosper. But this is only because it has undergone a major transformation. Anyone who has examined it recently knows that the method of health care and delivery has changed radically in the past five years.⁹ Where once the medical profession was tightly controlled by individual doctors and medical associations, the profession has all but shifted control in a few short years to huge health-care conglomerates. The independent, individual practitioner is all but predicted to disappear in the next few years except for highly skilled

specialists. The event triggering all this? The astronomically rising costs of medical care. Where once every hospital (like every library) argued it had to have one of the latest technical innovations (or books, in the case of libraries), the astronomically rising costs of medical care put a change to all this. Actually, it was the U.S. government in the form of medicare benefits and payments that put an end to the traditional behavior of doctors and hospitals. The U.S. government said in effect that it would no longer pay whatever doctors charged (a highly critical assumption that the medical profession had been making if ever there was one). Indeed, the government said that from a certain date on it would only pay fixed fees for medical practices. As a result, those individual doctors and hospitals that only knew how to play the game by "open-ended costs" found themselves no longer able to play within the rules of the new game, or in our language, new assumptions. The winners of the new game became those who were willing to learn how to deliver "quality" care at greatly reduced costs. (The jury is still out whether this can be done for all segments of the population; indeed the fear is that the rich will get quality health care at a cost they can afford to pay and the poor will get neither good care at an affordable cost.) In short, the winners will be those who know how to

deliver health care for profit within the "constraints" of the new game.¹⁰

Thus, the emerging winners within the health care industry have clearly recognized the fact that the old assumptions are outmoded. Second, they have clearly initiated new organizational experiments such as HMOs or health maintenance organizations to deliver a different kind of health care by means of a different way of financing it. What is so truly fascinating to us is that some of these organizational experiments embody some of the very same innovations as G.M.'s Saturn's project. Thus, Humana Hospital, for instance, one of the biggest HMOs and health care organizations in the U.S., if not the world, is experimenting with computer terminals beside every patient's bed.¹¹ The purpose, like that of the Saturn experiment in locating computer terminals in every dealer's showroom, is to reduce labor costs by cutting the expenses involved in storing, retrieving, and updating the tremendous amounts of information connected with running a hospital. Here, once again, we see the significant and critical role that information is playing in the present age.

No discussion of industries would be complete without mention, however brief in passing, of two industries that have played a central role in the development of this nation's economy as well as being two of our biggest successes. These

are the agriculture and housing industries.¹² The most cursory examination of these two industries reveals once again the critical role that assumptions play in the health of an industry over the course of its lifetime. Furthermore, the idea of a significant organizational experiment as central to the health of an industry's survival takes on new and added meaning through examining these industries.

As different as agriculture and housing are, they share nonetheless a number of common features. One, by the nature of their businesses they are extremely cyclical and subject to extreme ups and downs. In part this arises because both are subject to seasonal economic and weather fluctuations. For another they are extremely sensitive to and dependent upon fluctuations in other parts of the economy, for example, changes in interest rates which greatly affect the borrowing patterns in both industries of both the producers as well as the consumers of their products. Because of the large geographic, seasonal, and economic variations between different regions of the U.S., it has long been a tenet of faith (assumption) in both industries that single family home construction and farming are best practiced by small, individual family firms. The assumption is that economies of scale that have been obtainable in other industries are not possible in them. The consequence is an assumed constraint on the kind of organi-

zational experiments that are possible in both industries. If conventional wisdom in both industries is to be believed, nothing akin to a large-scale Saturn project seems possible in either.

It should not therefore be concluded that major organizational experiments have not been undertaken in each industry. To the contrary; as countless commentators have pointed out, the agriculture industry in particular would not have achieved the success it has were it not for the extensive role that the U.S. government played, mainly through the Department of Agriculture, in supporting farmers. Indeed, the U.S. government has supported nearly every aspect of farming from the education of farmers to modern agriculture practices, the mass dissemination of innovations, not to mention what is perhaps most critical of all, an extensive financial support system in the form of subsidies and tariffs.

One would have to be deaf, dumb, and blind not to know that these industries have been in serious trouble for some time. The very dispersed nature of both industries is in fact part of the very problem in knowing what kind of new organizational experiment is appropriate at this time. It's not that proposals are entirely lacking such as the complete withdrawal of all forms of farm price supports. Such proposals have always been and always will be with us. What's seriously

lacking in our opinion is proposals for reform that are based on our two principles: (1) a systematic analysis of all the key assumptions upon which both industries have been based and (2) a series of far reaching organizational experiments based on the challenging of the original assumptions.

We have constantly stressed the critical importance of these two principles throughout this paper because of the key role that they play in social life. Assumptions are and have always been the foundation, the cornerstone, upon which everything rests that we as humans do. Assumptions are the basic social glue that tie and hold everything that we do together.

Given their key importance, it is therefore all the more surprising to find that there are virtually no major trade or industry associations in this country which track systematically over time the major assumptions upon which a particular industry is based and which attempt to look for signals however weak which are undermining those assumptions. Because the task is so basic, it has thereby been neglected. In our view, there is no more essential task, no more basic information that one could collect, that is critical to our survival than the constant knowledge of one's underlying assumptions.

As the world has gotten increasingly complex, we are constantly being told that we need to collect more and more information if we are to master the world. We disagree

strongly. We don't need more information per se; we need less noise. What all industries need is a succinct statement of key assumptions. What they need is a way of thinking about their most vital interests.¹³ This has been the prime purpose of this paper, to reinforce a way of cutting through complex issues, and not to assess the detailed condition of every industry. This should be the central task of all industry associations. To paraphrase a statement of Russell L. Ackoff, to manage effectively in a global economy does not require endless amounts of relevant information; it requires less irrelevant information.

Notes

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3. Ibid.
4. Abernathy, op. cit., p. 46.
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11. Bruce Keppel, "Humana Will Test Computer That Could Cut Hospital Labor Expenses," Los Angeles Times, Sunday, September 8, 1985, p. 4.
12. See Lawrence and Dyer, op.cit.; see also Ezra F. Vogel, Comeback, Case By Case: Building The Resurgence of American Business, Simon & Schuster, New York, 1985.
13. See Richard O. Mason and Ian I. Mitroff, Challenging Strategic Planning Assumptions, John Wiley, New York, 1981.

