Donald Ephlin

"The Changing Role of the Union and Competitiveness"

The 1989 Jerry Wurf Memorial Lecture

The Labor and Worklife Program
Harvard Law School

The annual Jerry Wurf Memorial Lecture is made possible by an endowment fund to Harvard University's John F. Kennedy School of Government, established in honor of the president of the American Federation of State, County and Municipal Employees, AFL-CIO, from 1964 to 1981.

The fund receives contributions from the Union and from friends and associates of Jerry Wurf. Among other activities, it finances scholarships for Harvard's Trade Union Program and Program for Senior Executives in State and Local Government.

THE 1989 JERRY WURF MEMORIAL LECTURE

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Introduction

by William Lucy

Organized labor is rarely associated with ivied walls and olive groves, but Harvard's Trade Union Program has taken a major step towards correcting that.

Through the Jerry Wurf Memorial Fund, AFSCME has been associated with Harvard since 1982. Our ties grew even closer last year with the organizing campaign that brought more than 3,000 of Harvard's clerical and technical workers under the AFSCME flag. Some say this makes AFSCME part of the Harvard Family, and some put it the other way around, but either way, both Harvard and AFSCME are the better for it.

Historically, labor has sought to balance the scales between those with power and money and those who depend on work and wages.

This is solid evidence that both seek to be part of the solution rather than part of a problem that currently plagues America. For thousands of years now the philosophers and historians have warned us that, in the words of George Santayana, "Those who cannot remember the past are condemned to repeat it." The warning most often goes unheeded, and at a terrible cost.

Here in America, historical memory seems to grow ever shorter, and we slide from Vietnam to Central America with scarcely a pause. We are here tonight partly because of another lapse in national memory: a lapse in memory regarding what happens when the individual pursuit of power or profits takes precedence over society's collective well-being. I need do no more than mention Frank Lorenzo on the one hand, and the nation's involuntary poor on the other, to illustrate this point.

Historically, labor has sought to balance the scales between those with power and money and those who depend on work and wages. In this effort, labor has accomplished social and economic miracles. Unions have played a crucial role in creating modern America.

Today, however, much of the struggle has been forgotten along with the cause, and both organized labor and working America have paid dearly as a consequence. The Wurf Fund's underlying aim is to restore labor's goals to the nation's consciousness, and to do that not just by examining history but by preparing a new generation of labor leadership capable of dealing with today's realities.

To me, working people and union membership should be synonymous, as both stand for the best that is within the American spirit. This same vision formed Jerry Wurf's career, and the Fund was established shortly after his death in 1981 as a living memorial to his work and his dream.

Through the fund, AFSCME staff members participate in Harvard's Trade Union Program. The Fund also supports an annual Wurf Fellow who can bring the viewpoint of labor into the University setting.

The Fund sponsors the annual Jerry Wurf Memorial Lecture by outstanding leaders in the cause of labor rights and human dignity here and abroad. Our speaker this evening, Donald F. Ephlin, is International Vice President of the United Auto Workers and Director of the UAW's largest unit, the General Motors Department, with nearly 400,000 members. As such, he has led the Union's side in historic negotiations with management.

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Along the way, Brother Ephlin has served on Presidential Commissions and the Council on Competitiveness, a Federal Task Force on Worker Dislocation, and on various bodies addressing such issues as productivity, international trade, and health care. As important as anything else, Brother Ephlin has never been afraid of reexamining the relevance of labor's traditional positions. For example, he is one of labor's leading authorities in the field of joint labor-management problem-solving.

There are some in labor who see this as a threat, and as a result, our speaker has earned that wonderful tag of being controversial. This alone puts him in the mold of Jerry Wurf, who sometimes seemed able to generate controversy by singing "Solidarity Forever."

The Changing Role of the Union and Competitiveness

Our nation's competitiveness has concerned us for some time as we have seen thousands of our best paying industrial jobs lost to foreign competitors. When our government failed to act to stem the erosion of our nation's most critical industries, another burden was placed on an already overburdened collective bargaining process.

"If you don't like things as they are, change them."

Only in America is the collective bargaining process almost totally responsible for health care, pensions, worker training and the preservation of our basic industries. This heavy reliance on collective bargaining has led to an ever changing and expanding role for the union and its representatives.

Allow me now to chart part of that evolution from the perspective of a long time UAW representative who was privileged to serve alongside some of the giants of the labor movement.

A little more than 40 years ago I joined the United Auto Workers, just 20 miles away from here at a General Motors Assembly Plant. As a fledgling local union member and then officer, I was captivated by Walter Reuther's graphic dream of what our world could and should be like.

The company and the union were at the time staunch adversaries. We were like participants in a football game. One major problem was that we in the union were on defense all the time except for a couple of months around contract time every few years.

Quickly, I bought into Walter Reuther's dream of a better tomorrow. Like him, I wanted to be on the offensive unit. He inspired me to develop my own working and union code: "If you don't like things as they are, change them."

During that period, life in the labor-management area was relatively simple. Management acted and the union reacted—with grievances or even strike action.

Through bargaining we were making great progress in achieving improved economic benefits—wages, holidays, health care, pensions, and even Supplemental Unemployment Benefits (SUB).

I shall never forget the preparations leading up to 1955 negotiations. Walter had us all dreaming of achieving GAW, a Guaranteed Annual Wage. It seemed like an impossible dream, but since 1955, we have made steady progress towards that goal.

As we made progress in bargaining new benefits, the role of the union representative at both the Local and International levels expanded as well.

In 1956, Leonard Woodcock became the Director of the General Motors Department. One of his first acts was to pledge to open up local plant-level bargaining.

Prior to that time, all bargaining at the plant level ended when a National Agreement was reached. This action by Leonard was a dramatic departure from the past and had a lasting impact on the roles and responsibilities of local union leaders.

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The local bargaining committee was and is the union in the plant and on the shop floor. Suddenly, they had influence over what would happen, not only in insuring contract compliance, but in improving working conditions and the way workers were being treated. Suddenly, the local union leaders were on the offense.

A short while later, Leonard Woodcock invited me to join the staff of the GM Department. There were about 30 of us in the department at that time, performing two major functions. One group was involved in servicing—handling crisis bargaining and assisting local union leadership. The other screened grievances and handled all arbitration for the 400,000 GM members of the UAW. That was my initial assignment. Later on I will contrast the General Motors Department of 1960 with the new expanded department of today.

GM was determined to keep the administration of benefit plans—SUB, Pensions, and Insurance—out of the hands of labor relations, with all the attendant problems. We therefore built a separate process for resolving benefit plans issues at the plant and corporation level. We have in the years since then developed a large group of very well trained union representatives who devote full time to administering these programs.

Gradually we, the company and the union, together developed apprentice programs, joint health and safety committees, and employee assistance programs.

The turbulent '60s and '70s brought some new problems to light. We looked to our friends in Sweden for guidance because they were experimenting with new ways to perform work because of their problem—one we have not experienced, called full employment. The Swedes were known for their efforts to democratize the workplace.

In our 1973 negotiations, we added a letter in our labor agreement establishing National Quality of Work Life (QWL) Committees at each of the Big Three auto companies. One interesting part of that letter said:

The second oil crisis in 1979 caused our whole world to be changed forever.

"These and other projects and experiments which may be undertaken in the future are designed to improve the quality of work life, thereby advantaging the worker by making work a more satisfying experience, advantaging the Corporation by leading to a reduction in employee absenteeism and turnover, and advantaging the consumer through improvement in the quality of the products manufactured. . ." (There is reference to product quality, and that was long before we faced any real competition for our markets.)

Irving Bluestone, then Vice President and Director of the UAW General Motors Department, had some success at slowly introducing QWL which led to a small degree of involvement by employees on the shop floor.

As the '70s drew to an end, we were faced with yet another challenge. The second oil crisis in 1979 caused our whole world to be changed forever. Suddenly, America's four auto producers, with little competitive experience, were under siege from abroad. If I can switch sports and make another analogy, it was like our individual amateur hockey teams facing an all-star Russian team that was supported by that state. Our only experience was fighting each other. For a while it appeared we would be overwhelmed. Many in America were ready and willing to write off the auto and steel industries. I believe a term used at the time was, "sacrificed at the altar of free trade."

One lesson you learn early in the labor movement is how to take advantage of opportunities. The crisis of the early '80s presented difficult challenges, but it also presented us with unique opportunities.

Ford Motor Company was very hard hit by the almost overnight changes in the marketplace. As Ford's losses mounted, they turned to plant closings and outsourcing of work in an unsuccessful effort to stem the tide.

We agreed to open our agreement several months before

its termination date. While the company sought economic relief, our goal was to stop the hemorrhaging of our jobs. As Director of the Ford Department for the UAW, I, along with President Douglas Fraser, entered the bargaining in Ford's darkest hour.

Yes, we gave up some special holidays that we had introduced at Ford in 1976 to shorten work times, and deferred some cost-of-living payments. The Agreement contained no annual improvement increases in 1982 or 1983, although COLA was continued. Otherwise, we made no economic concessions. Because of our earlier success, some of our people counted wage increases that we never had as concessions.

Ford agreed to set aside $0.05 an hour into a fund to be administered jointly, providing training and education for active and laid-off workers.

We, for the first time in the Big Three, introduced profit sharing which had been a UAW objective for nearly thirty years. It wasn't too important in a year when Ford lost two billion dollars, but it has since paid off handsomely for Ford workers.

We managed for the first time to get commitments to stop plant closings and started to place some restrictions on outsourcing.

For the first time, Ford agreed to set aside $0.05 an hour into a fund to be administered jointly, providing training and education for active and laid-off workers. This was improved at GM in the bargaining that followed.

At our June, 1983 Convention, Owen Bieber was elected President of our union and I was assigned as Director of the General Motors Department.

Soon after my return to General Motors, GM Vice President of Industrial Relations Al Warren and I agreed to set up a joint study team to see if we could find a way to build a small car that would be competitive with the imports, but built here in the U.S.

That group of 99 employees, hourly and salary, produced a set of recommendations to us, union and management, that would later result in a very significant new kind of agreement.

The chairman of GM, Roger Smith, agreed to build the Saturn project in the U.S. if we could work out an agreement embodying the principles set forth in the Study Committee recommendations.

Later in June, 1985, we achieved such an agreement. That agreement changed the union's role completely. The recognition clause includes this statement: "From the outset, the Saturn project has been a joint effort of both union and management."

This milestone agreement provides, among other things, for the union to be involved at every level of decision-making, all workers to be paid on a salary basis, complete job security, no layoffs for all regular employees, and one risk and reward system for all employees.

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The Presidential Commission on Industrial Competitiveness defined successful competition as the capacity to compete with anyone in the world on the basis of cost and quality without eroding the American standard of living. Saturn meets that test.

As 1984 bargaining approached, we knew everyone was concerned about job security. Some of my staff and some of Mr. Warren's staff started exploring ways to provide job security. They produced the skeleton of a plan which we then fleshed out during bargaining. That program, Job Opportunity Bank Security (JOBS), for the first time provided that no GM worker with a year's seniority would be laid off because of new technology, outsourcing, or agreed-upon productivity improvements. The underlying significance of this agreement is a tribute to management's and the union's new problem-solving approach in bargaining. Significant improvements were also made in the area of curbing outsourcing.

In 1987, the UAW and GM went to work on the product quality issues. A joint task force produced a plan which ultimately became known as "The Quality Network".

Earlier, I was invited to become a member of the Corporate Quality Council, a group of GM's top officers. When Bob Stempel became President of General Motors, he invited me to co-chair that group.

Today, the Quality Network is GM's one process for the way all products are built and all phases of the business are conducted. It is a joint program at all levels. The Network is built on a solid foundation of customer satisfaction through people, teamwork and continuous improvement. The beliefs and values set forth in the Network include very fine principles and represent a significant change in management philosophy. The Quality Network acknowledges the wealth of expertise and commitment to quality among all GM employees.

We have just completed a series of two-day training sessions for 3,500 UAW and GM leaders including top GM executives, union leaders, engineers, designers, financial people, and others from throughout the corporation.

The program was conceived and carried out by union representatives and other non-represented employees. Every employee is expected to be committed to quality and customer satisfaction through people, teamwork, and continuous improvement. The improvements in quality already made are a critical step in restoring competitiveness.

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During early 1987, Wall Street analysts and other so-called experts were recommending that GM become less integrated by getting out of the components business. Reducing GM to the same level of integration as Ford and Chrysler would have cost us tens of thousands of jobs. We started to work with management to secure those jobs and to make the component plants more competitive.

In 1987 bargaining, first at Ford, then at GM, we made improvements in the JOBS program and instituted a process for improving operational effectiveness. At every plant in GM, the top management and top elected union leadership were charged with studying their own situation and then devising a plan to solve some of their problems. We called this process Attachment C of our agreement. Using this approach, we scheduled meetings by Division or Group. The reports were then made to me as Director of the General Motors Department at the union and my counterpart, Al Warren. Many GM executives attended some of these meetings.

The results were encouraging. Watching plant managers and local union leaders spell out to this audience of peers and executives exactly what they planned to do was a tremendous experience. I have never been prouder of my union colleagues. Some ingenious plans were outlined to reduce waste, improve quality, and in general to come to grips with competitive problems. Our underlying goal was to increase job security. None involved reducing wages or benefits and thanks to our JOBS program, nobody was laid off.

Today, many of GM's component plants are profitable and competitive. Some work is being insourced and efforts are underway to attract new business.

In contrast to the limited scope of activities in the GM section of the union years ago, today the staff performs a variety of new responsibilities. Today the General Motors department staff still carries out the traditional bargaining responsibilities and arbitration, but the case load is dramatically low due to our changed relationships.

In contrast to the limited scope of activities in the GM section of the union years ago, today the staff performs a variety of new responsibilities.

Four members of my staff are involved full time at Saturn, three in Michigan, one in Tennessee, helping to manage the startup of this great new effort. Eight work full time on the Quality Network, helping to implement this one process all across the corporation.

A large number work out of our Human Resources Center, carrying out a massive, jointly administered training and education effort. This includes training for active and laid off employees, job search assistance for displaced employees, a four-week Paid Education Leave Program, skills enhancement programs, as well as basic literacy education. The joint Health and Safety Program has its own school facility to train the trainer in a hands-on environment and then a process to spread that learning back at the plant. Additionally, training efforts are now underway to teach every foreman and union committeeman in GM how to make the workplace safer and how to recognize drug and alcohol problems. Of course, we then have a joint effort to counsel and assist employees with these problems.

We jointly administer the JOBS program, elaborate benefit programs such as pensions and insurance, and SUB. Working together, our joint staffs have developed many processes to reduce health care costs without reducing benefits or shifting the increased cost to employees through co-pays or deductibles.

When outsourcing issues arise, the staffs assist local leadership in understanding competitive costs and in exploring new ways to make our operations more viable.

The staff assigned to the car and truck groups are co-leading joint strategy committees planning for the future in our stamping, assembly, power train, and tool and die activities. Looking to future skilled trades needs, for example, has led us to establish special apprenticeship programs to help die makers become die designers.

Under staff direction, hourly employees are involved in the process of developing new products and shortening the lead time to bring new products to market. Drawing on our people's talents, production workers are involved with designers and engineers to make new products more buildable.

This new, broad-based role for the union is a logical extension of our traditional role of improving working conditions and improving wages and hours. Fundamental to those items is the protection of jobs themselves.

Thus the union's role in many areas formerly reserved for management is critical to these efforts.

I continue to believe there are only two stakeholders in the corporation—the stockholders and the employees. One invests his money, the other invests his life. Both are represented by others to protect their investments.

I continue to believe there are only two stakeholders in the corporation—the stockholders and the employees. One invests his money, the other invests his life.

Both groups of stakeholders should be considered as decisions are being made. Individual employees functioning as management should not be allowed to destroy corporations and jobs for personal profit at the expense of thousands who have invested years in building that entity. Employees, through their designated union representatives have a need for input and consideration as to plants being closed, products being discontinued, and new products and components being sourced. All employees should be covered by one reward system. We have already tied executive bonuses to profit sharing at one corporation and made some progress toward achieving equality of sacrifice for all employees. Much remains to be done.

The joint activities currently underway have been beneficial to both stakeholders by improving quality, increasing competitiveness, enhancing job security and improving the quality of work life. Saturn is demonstrating the great value of the total involvement of workers and their union in every facet of the business.

America's labor law needs to be brought up to date. Our nation cannot be competitive if our laws hinder progress in this vital industrial sector. Many corporate proposals, like tying wages to price cuts and some of our most successful joint efforts might be considered illegal by the enemies of organized labor.

The new expanded role of the union has paid dividends in many ways at GM. Our joint efforts have protected 5,000 jobs that were slated for outsourcing and have resulted in

2,000 jobs being brought back in house.

The new responsibilities of being a union representative make it a much more difficult job than it used to be. Future generations of union leaders will need broad academic training as well as shop floor experience to handle the complex world of bargaining. Sometimes these very approaches are politically hazardous, but leadership has never been easy. The benefits to be achieved make the risks well worthwhile.

We have made this progress in the auto industry at a time when our industry was under serious competitive attack and the labor management climate in our country was at an all time low. Think of what we could achieve if labor, management, and our government were all working together.

Lessons Learned

Linda Kaboolian

It is with all the privilege and clarity of hindsight that we can look back to 1981 and the decimation of the domestic automobile industry and the UAW's response. It should never be overlooked that the union's reaction to the loss of hundreds of thousands of jobs occurred in the following context: in the absence of a national industrial policy; during a political administration that placed a higher value on consumer access to cheap cars than on working men and women; in the midst of aggressive antiunionism fostered by the government; in an industry that was already pursuing an international manufacturing strategy and therefore had only the barest interest in the long run preservation of domestic manufacturing.

Strategic planning is an unaffordable luxury in crisis situations.

Given the context, the UAW is to be congratulated for having survived as an organized force, representing a diverse work force in a period of uncertainty and crisis. As an organization, it struggled to invent new strategies to deal with industrial restructuring before many industries and unions were faced with similar dilemmas. It is now time to look back on that struggle and glean from it the lessons provided by the UAW's experience and actions.

First, the experiences of the UAW have taught us that all unions need to be engaged in an ongoing process of strategic planning. This process analyzes the union's external economic and political environments. It also attempts to understand and take into account the limitations and resources raised by labor and corporate laws, the traditional ways of doing union business, and the expectations and desires of the membership.

Ten years ago the UAW was in the first year of a contract which was beginning to realize the goal of a four day work week. Two years later it was confronting hundreds of thousands of layoffs and scores of plant closings. This crisis did not catch the union unprepared simply because it lacked good economic forecasting. In fact, the UAW has one of the best research departments in the country.

However, strategic planning requires more than anticipating the future—it also means having an operating plan for future scenarios. Strategic planning is an unaffordable luxury in crisis situations. We've learned that it has to be done before a crisis; or otherwise, it may take many years to undo the consequences of actions taken in the heat of the fray.

The second lesson we've learned from the UAW's experience involves the union's new role. Mr. Ephlin has correctly pointed out that in the United States we have leaned quite heavily on collective bargaining and are now expanding the arena to include participation in corporate operations. However, even in cooperative activities—projects in which companies and unions work together—we have learned never to assume that the company and union share all the same interests. They don't and they never will. Certainly their interests overlap in many places and some cooperative arrangements may benefit workers. However, fundamentally, unions and companies and, in the public sector, unions and public management, are different types of organizations with different roles to play and different interests to promote.

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Why is it necessary to raise these issues at this time? Because a decade of conversation about the benefits of less adversarial labor relations and more cooperative union-management behavior may have blurred some important distinctions between labor and management. It is true that the functions of the union and corporate executive share many similar characteristics. It is also true that both unions and management represent owner-stakeholders. In the United States we tend to overlook the intense feeling of ownership workers have for their jobs, their industrial communities, and the corporations or public agencies in which they work. We ignore them until we are jolted by an example like the union members at Eastern Airlines who truly believe they have more ability and more right to run Eastern than does Frank Lorenzo. There are other examples of this form of ownership. In the public sector, workers demonstrate their ownership every day in their commitment to the clients and programs they serve. In the present case, even before the downturn, U.S. auto workers expressed unheeded concerns about the quality of domestic products.

Despite these similarities, unions and management differ in two important ways that affect cooperative agreements:

1. A union is a political, ideally democratic organization, and management is not.

This fact makes it impossible for a union to change its course or adopt a strategic plan without first going through a political process. Crisis situations and reactive policies tend to have a negative effect on the probabilities that this will happen. The UAW faced some dark moments on this point, as when the Canadians seceded from the union.

Unlike managers, union leaders are elected. Unlike managers, they are obligated to encourage debate and an open marketplace of ideas. The benefits of this far outweigh the costs, but I know from my own experience as an elected union official, it's hard to imagine that this is true when you are the target of the rotten tomatoes.

2. The second difference between unions and management is the way in which workers are viewed by the two organizations.

... In our economic order, workers are seen fundamentally as tools to provide the service or to make the product.

To union leaders, workers are members or potential members. They are dues payers; they may be your competition in the next election, but most importantly, they are a union's reason for being. To companies and managers, however, workers are human resources. To the best managers, workers are to be respected for their knowledge and contributions. However, in our economic order, workers are seen fundamentally as tools to provide the service or to make the product. To managers, that means that low-wage foreign workers are opportunities and that all workers are ultimately expendable.

Since workers are seen in different ways, unions and managers really do not completely share the same interests. This point is illustrated by three facts in the auto industry: 1) while the UAW and the domestic auto industry are engaged in a variety of projects outlined by Mr. Ephlin, the Big 3 manufacturers are taking advantage of low wage foreign workers to make cars for domestic consumption; 2) while quality improvements are of paramount concern to the union, the April automotive edition of *Consumer Reports* shows that of the first forty cars recommended for purchase, only eight have domestic labels and half of these are built overseas; 3) at the same time, the domestic companies have an ownership share in the best foreign manufacturers. What do these facts lead us to conclude about domestic manufacturers' reciprocal commitment to building quality products at home?

For the two reasons stated above—because unions are political organizations and because managers and unions have a different view of workers—we should never lose sight of the fundamentally different interests of companies and unions, most particularly when we act cooperatively with each other.

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The UAW has been a leader in formulating the role unions can play in restructuring an industry. The union has been faced with enormous challenges. It took many risks. Other unions will face similar structural changes; privatization is the restructuring analogy for the public sector. Because the UAW acted rather than remained static, we are all advantaged by the lessons that we can learn from the UAW's experience and the opportunity to discuss them.

The Forces Driving Change

Kim B. Clark

Significant changes in the auto industry are driven by long-term forces in the international economy, and have been underway for some time. We have begun to see a number of their effects, but much is yet to come. Tonight I would like to sketch out the forces driving change, their implications for competition, and the challenges that are likely to confront the union and management over the next decade.

Three forces are driving change in the industry: the growing fragmentation of markets, the growing diversity of technology, and the intensity of international competition.

Three forces are driving change in the industry: the growing fragmentation of markets, the growing diversity of technology, and the intensity of international competition. A little bit of data will give you a flavor of what is happening in market fragmentation. In the early to mid 1960s, the largest selling model produced in the United States was the Chevrolet Impala which, in all of its different versions sold close to 1.5 million units per year. Today the largest selling model produced in the United States sells something like 400,000 units per year. That is a decrease by a factor of four in the economies of scale associated with particular models. Let me give you another piece of data. In the period 1982-87, automobile firms in Japan introduced 90 new models into the market. During the same period, U.S. firms introduced about 30, and European firms about 40. Thus over that short seven year period, the market saw about 160 new models introduced into the market. This proliferation of models is driven increasingly by sophisticated and discriminating customers.

The second driving force is technical diversity. Here again let me give you just one piece of data. In 1970 there were five different engine drive train packages in production in the United States. One package—the longitudinally mounted, carburetted V-8 engine hooked up to a three speed automatic transmission with rear-wheel drive—accounted for about 70% of all production in the United States. By 1980, the number of engine drive train packages had risen to 21. By 1984, the number in production was 34. If we extended our analysis to other parts of the vehicle, particularly electronics, we would find a continuation of the same theme: dramatic increases in diversity of technology in the product.

The third driving force is international competition. In the 1950s there were five or six firms capable of competing on a global scale. Today, that number is about 20 and has continued to increase. In addition, the competitive environment has become much more intense and rigorous, particularly compared to conditions that prevailed in the U.S. in the 1950s and 1960s. This change in international competition has had a number of effects. Firms not only have to be much better at what they do, but with many competitors and the need to operate globally, strategy has become far more complex. In short, the environment has become more turbulent and uncertain.

In short, the key today is dynamic manufacturing.

One of the effects of these forces is that manufacturing's role in competition is far more dynamic today than it was prior to the oil shocks of 1973 and 1978. In contrast to an earlier era of stability where the focus in manufacturing was "metal out the door," the emphasis today is on learning, change, and flexibility. In short, the key today is dynamic manufacturing. That change in environment has dramatic implications for the nature of the work in plants and for the structure of the organization that governs production. The changes in the industry of the last decade are just the beginning. The revolution has only just begun. Let me give you just a couple of examples of the changes that lie ahead.

Computer-based automation will bring the traditional tasks of production management (supervision, coordination) under the control of computer systems. Competitive advantage will derive less from close supervision and coordination, and far more from the ability to implement new technology, products, and systems into plants. A critical issue here is the responsiveness of the organization—its ability to quickly and effectively execute projects that will introduce new products and/or new processes. Thus, the ability to work in teams, the organizational capability, and human skills for effective collaboration will be critical.

If one follows the logic of dynamic manufacturing further, one of the implications will be the need for substantially enhanced skills at all levels in the organization. In fact, dynamic manufacturing is much more like engineering than it is like traditional manufacturing. People operating the system—not staff groups, but the line organization—will need skills in statistical process control, problem solving, maintenance and trouble shooting, and software and product design. These are skills that are far more like those associated with engineering than with the traditional plant-level workforce. This change calls for significant investment to enhance the quality of the human resource in the organization. It also calls for an attitude and organization that relies on and effectively uses those skills.

A third change is the depth of knowledge required to compete successfully in manufacturing in the future. Experience over the last decade has taught us that process control —the ability to operate processes with very high reliability and very high up-time, and produce consistently outstanding products—is based on the depth of knowledge that the organization acquires and applies in its processes. The drive for greater process control will transform the knowledge base of manufacturing from art to science. I believe this will require a science of manufacturing in which we look to the factory itself as the source of new information and insight about the processes actually in place in the manufacturing environment. This means that the critical role of people in the manufacturing environment is to learn—to learn from experience, to run experiments, to interpret data, and to incorporate that learning into new procedures, new equipment, and new systems that capitalize on that knowledge.

The forces of dynamic manufacturing will create significant change in all aspects of the production system. I applaud the work that Don and his labor and management colleagues have done in creating new approaches to the organization of work, skill development, quality, and continuous improvement. These institutional responses are a credit to the collective bargaining system. They point out the way, but much work lies ahead. The challenges are significant, but I think Don Ephlin has helped to lay a good foundation for the future. With the progress made in the last several years I believe there is good reason for cautious optimism about dynamic manufacturing in the U.S. auto industry.

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