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ABSTRACT

The United States is facing two major ongoing structural economic changes. First, the United States has helped create a world of open trade, and it is competing with underdeveloped countries who have an opportunity to industrialize very rapidly. Second, technological development is proceeding at a fast pace. High-wage industries in the United States, the Western industrial nations, and Japan will have to find profitable enterprises other than manufacturing because of the low-wage workers in the developing world. Economic opportunities need to be found in which American companies can do well enough to sustain present wage levels. The United States must cultivate or develop enough industries that are so technically advanced that they create near monopolies. Technical competence must first be enhanced greatly at the highest scientific level in the universities. Then, vocational and technical education must be delivered early, in the grade schools, high schools, and two-year postsecondary institutions. This recommendation requires finding funds to acquire expensive equipment, to change the curriculum, and to hire people who can deliver technical instruction. (Questions and answers about vocational education and economic change are appended.) (YLB)

Structural Changes in the Economy and Future Job Prospects

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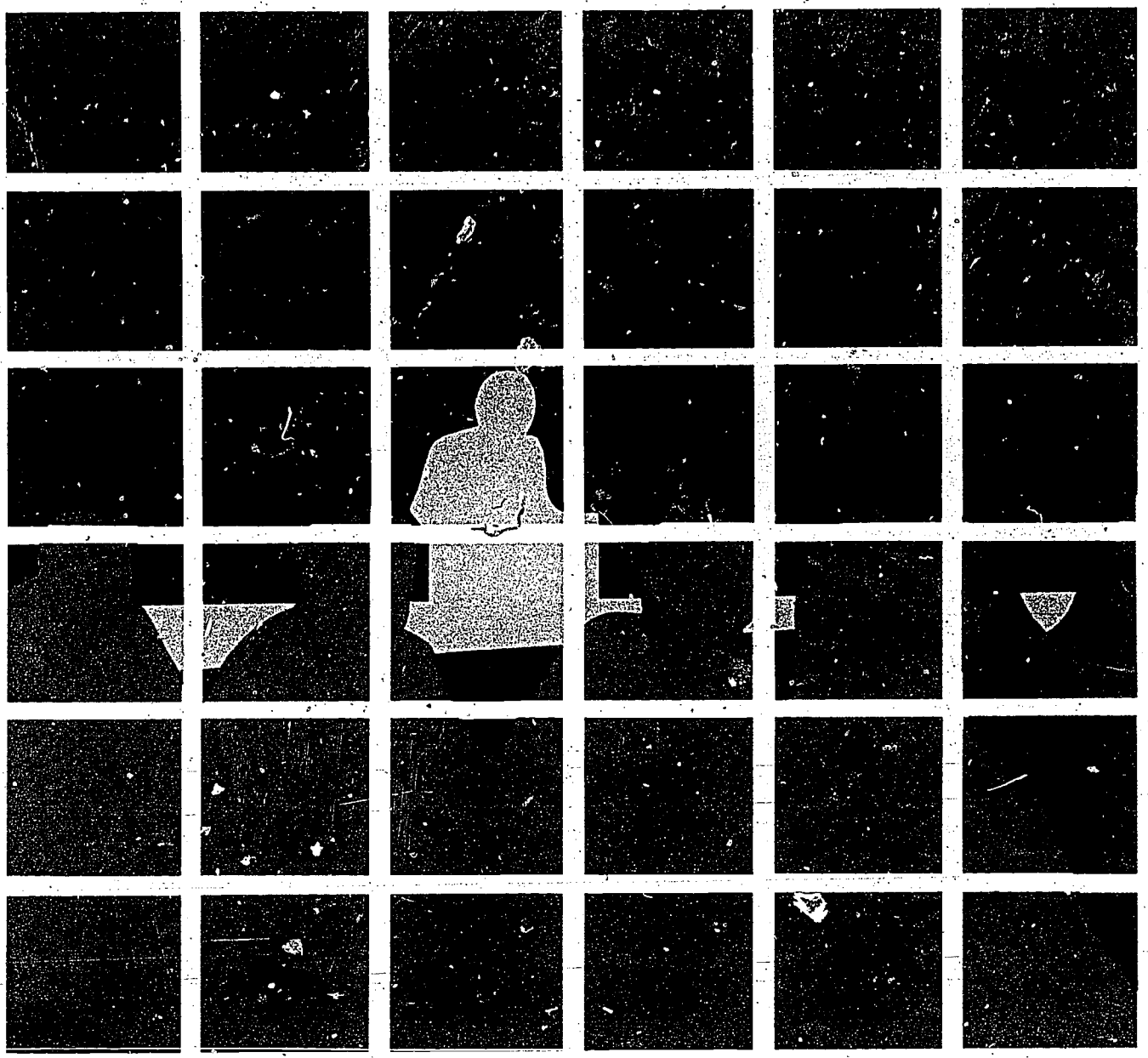

Occasional Paper No. 92

STRUCTURAL CHANGES IN THE ECONOMY AND FUTURE JOB PROSPE

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1983

FOREWORD

Political structures and engrained American traditions underlie many of the economic and related educational problems of our current, recession-swamped economy. This is the premise of Dr. Paul Craig's presentation, "Structural Changes in the Economy and Future Job Prospects," delivered to the National Center staff on January 12, 1983. Dr. Craig discusses how foreign competition, forces within our own economy, and barriers within education have contributed—and may be expected to continue to affect—our economic circumstances. He offers a variety of original insights and approaches whereby vocational-technical education at all levels can become part of the solution, rather than continue as—in his perspective—part of the problem.

Dr. Paul Craig, Professor Emeritus at The Ohio State University, has his Ph.D. in economics from The Ohio State University. During the period of 1962-1967, Dr. Craig served as Chairperson of the Department of Economics, and at that time he had much helpful input in the establishment of the direction and objectives of the Center for Vocational and Technical Education, later to become the National Center. Dr. Craig later became Dean of the College of Behavioral and Social Sciences at Ohio State. Following that he was Vice-President of Academic Affairs at Florida State University in Tallahassee. He later returned to this university and is now Professor Emeritus of Economics and Public Administration.

Dr. Craig serves presently as a member of the board of directors of five corporations, including Worthington Industries, Concrete Construction, W.W. Williams, and others. He is also a consulting economist for Bank One and the Management Horizons Corporation. He has served as trustee for the Academy for Contemporary Problems, Otterbein College, as well as for the Ohio Citizens for Welfare, and for the Chamber of Commerce Economic Development Committee. He is well grounded in economics and has an in-depth understanding of how economic conditions affect corporations and workers.

On behalf of the National Center for Research in Vocational Education and The Ohio State University, the National Center is pleased to share the presentation by Dr. Paul Craig, entitled "Structural Changes in the Economy and Future Job Prospects."

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

STRUCTURAL CHANGES IN THE ECONOMY AND FUTURE JOB PROSPECTS

There is an intense interest today in economic development, communities' attracting industry, provision of vocational and technical training, and jobs promotion that is partly an outgrowth of the current recession. A greater number of people are being affected by this recession than by any other since World War II. The current recession is not really as bad as some people make it out to be, but it is the worst we have had in many people's memories.

The current recession is also worldwide. Germany had negative growth in its gross national product (GNP) in 1981; we did not. Germany also had negative GNP growth in 1982, as bad or worse than we. The Canadians have a deeper recession than we do. The British have higher unemployment than we do. The French have almost as much unemployment as we do. This devastating, worldwide recession has frightened all of us.

We should be very careful not to see the problem as only a recession. The recession is what captured our attention, but it is only a symptom of a more serious problem. Recessions come and go. We do not have to revamp the American economy or the educational system every time we experience a recession. This is the eighth recession since World War II, but we have not revamped the system eight times in the last thirty years. What is fundamentally at work here is not just a business cycle; what we need to understand is what is going on in terms of structural change.

If you stand on the beach at the ocean, the waves will come up and splash around your ankles at low tide. If you wade in closer, they will come up and wet your knees. If you are wearing shorts, once in a while a wave will splash your shorts. If you keep standing there, after twelve hours it will be high tide and you will drown.

When structural change is at high tide, you can be hit by the waves and drown. There are people out there in the work world who are drowning right now, and the Reagan a keeps claiming that even though the waves are hitting people it won't be long unt begins to recede.

Vocational-technical education—including the research and development at the National Center—has an opportunity to be a leader in developing positive responses to the high tide situation. If we were experiencing normal, incremental structural changes, it would be possible to deal with the daily waves; they always come in. We could simply step back and get out of the water if we were standing too close. But at high tide, we cannot step back enough. We have to do something else. We may try to build a seawall, for example. But we must do something . . . or drown.

Of course, it would be naive to deny that business cycles are real. Unemployment is high; people are being laid off in industries because industries are having a hard time. The people who are laid off in the automobile industry are unemployed partly because of the business cycle. But if you dig down to the bottom of things, the core of the problem is that the Japanese make better cars, cheaper.

The recent steel mill layoffs in Lakawana, New York, are partly a response to a business cycle situation. Demand for steel is in a slump. However, the real problem is that the Koreans make better steel, cheaper.

Before Boston was reborn as a high-technology center, New England as a whole (and Massachusetts in particular) was economically depressed. The shoe industry had left the area. People in Kenya make better shoes for less money than Massachusetts did. And it was a horrible shock to many Americans. We have the funny notion that if people do not speak English or have not attended American high schools, they are stupid.

One of the great myths in America is that we live in a high-technology society in which people need sixteen years of formal education to do anything that is rewarding. We probably will perpetuate that and continue to misdirect our vocational learning. The fact is that almost everybody working in a high-technology industry is an unskilled worker. There are a few people who design computer chips, but workers do not need a Ph.D. to assemble them. We need some very skilled engineers to develop computer-aided design and computer-aided manufacturing (CAD-CAM) technology, but workers do not need a degree in engineering to run the system.

I recently spent a day in a company that has just installed CAD-CAM, and the manufacturing is now done with a laser. The computer is a little minicomputer; it is not a big, high-powered mainframe computer. You design the product on the computer, and when you have it the way you want it, you turn the manufacturing over to the computer. It will run the laser machine that makes the product. There used to be seven machines that did the work; now the computer plus one machine does it. Ten workers used to operate the seven different machines, and they were all highly trained tool and die makers who made very high wages.

A few years ago, the National Cash Register Corporation (NCR) had eighteen thousand employees in Dayton, Ohio. They now have about two thousand, all of whom work at corporate headquarters. NCR does most of its manufacturing outside the United States. The company got rid of the union, and it got rid of most highly paid workers. It also got better workers for lower wages.

In effect, the great structural adjustment that is happening in the world is twofold. One is that, after World War II, the United States gradually developed a true world market. America battered down not all but most of the world's trade barriers. Today it is truly a world of open mark s, where trade is critical. Secondly, and just as importantly, underdeveloped or third wo countries now have an opportunity to industrialize fairly rapidly. They have benefitted tremendously by example, the strongest one being the extraordinary economic and technological growth of Japan.

In 1962, Japan produced 200,000 automobiles. The United States produced 9.8 million automobiles that year. At that point, America had a slight technical lead over the Japanese in that field. In 1982, America produced 5.7 million automobiles and Japan produced 11.0 million automobiles. You could say they now have a slight technical lead over us in that field.

It is uniformly acknowledged that the Japanese make better cars. They are also cheaper. Japanese companies make cars using one-half the labor hours per car that American companies use. Japanese also pay their workers one-half the wages per hour that American companies do, which means that the Japanese make cars at one-fourth the labor cost that we do.

Businessweek says that Toyota could cut prices by one-fourth and still make a profit. The reason that Toyota does not cut prices by one-fourth is that it would bankrupt General Motors.

Our government will not let them do that. So the Japanese gladly bask under the umbrella of General Motors and make excessive profits, which they can plow into the next industry they plan to dominate.

We are facing two major, ongoing structural economic changes. We have helped create a world of open trade, where capital is as mobile as merchandise; and we are competing with "underdeveloped" countries, which simply means they are poor. It may take twenty, thirty, or forty years, but they will invent the United Auto Workers in Taiwan. They, too, will invent social security benefits that reward people five or six times what they contribute. They will invent Medicare, and they will become a high-cost producer.

Taiwan will be in trouble by the year 2023 or maybe earlier. They may well lose out to the Philippines, which will be one of the last developers but already has a population of over a hundred million people. The Philippines will be the Singapore of the next century. And there will be other places. The Far East is a bottomless pit of Taiwans, Koreas, and Malaysias, with two billion people and still growing. The world will produce plenty of poor people with high intelligence who can learn in a few months to make cars or television sets. Of course, there will have to be at least a few people in those areas who know how to design the products. Those people will come to America and get degrees at the University of Michigan and will then rush right home—and General Motors will hire them to do it. General Motors will be over there, just like National Cash Register.

The other structural change is the rapid pace of technological development. The name of the game is change. At the time of the Civil War, 72 percent of the American labor force was employed in agriculture. At the turn of the century, 50 percent of the labor force was employed in agriculture. Just before the crash in 1929, 28 percent of the labor force was in agriculture. At the end of World War II, 20 percent of the labor force was still in agriculture. Since then, though, we have gone from 20 percent to 2 percent. Why are people upset about technological displacement? We have proven that we can take almost everybody out of the largest industry in this country and put them somewhere else and succeed at it.

We are going to do it again. This time we are going to move people out of manufacturing. Fortunately, manufacturing currently has only 22 percent of the labor force. If workers move out of manufacturing, the transition will not be as great as the agricultural transition was. It is not an insurmountable task . . . but it is a confusing one.

There are many other aspects of structural change, but the two discussed here have hit us the hardest. High wages are killing America. A steelworker in this country today earns twenty-four to twenty-five dollars per hour. That is not rhetoric; everyone who has an association with the steel industry knows it. At twenty-five dollars per hour, steelworkers make fifty thousand dollars a year as unskilled laborers.

The steelworkers have the mistaken notion that because they are paid such high wages, they are skilled workers. But any random Nigerian can be taught to do most of what American steelworkers do in only a few weeks. Of course, there are skilled metallurgists in the mills, as well as some engineers, but a large steel operation needs only eight or ten of those. A company could send them over from the University of Michigan again, pay them a lot of money to go help those Nigerians make steel. The Nigerians will work in a mill for three dollars a day, not twenty-five dollars an hour.

So all these unskilled American workers get high wages, but what will happen after the Nigerians start selling their cheaper steel? Either the world will quit being a trading world (which

is unlikely), or the protectionist movement will gather enormous momentum. The United Auto Workers and the United Steel Workers will all be lobbying for that in the near future, but I doubt the world will let it happen. Our comfortable affluence resulted from the international trade established in the last generation. It has worked so well that we are almost certain to hang onto it, at least for a while. But many of the high-wage industries in the Western industrial worlds and Japan will have to find other profitable enterprises than manufacturing, because the low-wage workers in the developing world will beat the socks off them.

All of this has a direct message for vocational and technical education. Companies and the government may try to put the heat on the steelworkers and the autoworkers to make wage and benefit concessions, but notice that even in this, the worst recession since World War II, they have not made many. The only significant concessions steelworkers have made were made just before a plant was closed. The autoworkers have not made any significant concessions; in fact, Chrysler workers have gotten back part of what they previously gave up. It is unlikely that we will go back to being a low-wage economy.

Therefore, if we do not wish to go down the tubes and have someone writing a book about the rise and fall of America, we need quickly to find economic opportunities in which American companies can do so well that we can sustain our present level of wages.

What we must do is create a new monopoly for American business and industry; that is, we should become so technologically advanced that those poor countries with their cheap labor cannot compete competently. We almost have a monopoly in the field of computer technology, but we are letting it slip away fast. Other people are learning to do it. So far, though, we are well ahead of whomever is in second place, including the Japanese. In telecommunications, which is broadly interlocked with computer technology, we have a fairly good technical lead, probably even over the Russians in aerospace technology. Now the "aerobus" in Europe (a three-country consortium backed by government subsidies) is about to catch up with us in the manufacture of certain kinds of aircraft. Overall, however, most of the world's aircraft are still manufactured by Boeing, Douglas, and Lockheed, though our lead may not last.

We probably have a technical lead in biotechnology, and we do have a definite technical lead in the sickness industry. I like to call it that rather than the health industry, because it deals with artificial hearts, organ transplants, kidney dialysis, and so on. We do not like to work on preventive medicine; there is not much money in it. The real money is in taking care of sick people. So we have a great lead in the sickness industry, and we may be able someday to export sickness care. For example, if you had the Mayo Clinic in your hometown you would have a very fine export industry. People from all over the world go there to be cured. Other examples are the Leahy Clinic in Boston and the medical center at Brigham Young University in Provo, Utah, which is a world center for certain kinds of health care or sickness care.

We have a technical lead in many fields, but we must very quickly expand our technical competence. We must cultivate or develop enough industries that are so technically advanced that they create near monopolies. Then we can exploit once again the cheap labor in the developing countries to make cheap steel, cars, and televisions. They will have never had it so good, and for one generation they will do that. Some of them will get rich at it, and middle classes will emerge in those countries. They will want exotic merchandise, and we will make them pay dearly for that exotic merchandise so that we can place the retrained, unemployed steelworkers in jobs that they will like (which will mean jobs that overpay them).

If we cannot create technological monopolies, the monopoly game is over. But even if the monopoly game is over, we could still survive. That would require a real restructuring of society,

though to bring back competition to the American labor market, and I assure you that that will lead to civil war—and I am not using the term carelessly. We would have to repeal the Wagner Act, the act that gave unions their current status in this country, and we would have to teach, by harsh public debate and war, millions of workers to recognize that they have exploited monopoly gains and that they cannot do it anymore. It is a route worth considering, but I doubt that Congress of this country will ever do it. Therefore, we had better get going fast on technological growth to create technical monopolies strong enough to let us keep paying those people monopoly wages.

That leads us to the question, "What are we going to do?" The first thing to do would be to enhance our technical competence greatly at the highest scientific level, which will mean developing more universities as good as Berkeley or Stanford or Harvard. We cannot continue to train our workers and conduct our basic research at such average universities as Michigan, Minnesota, Wisconsin, and Ohio State. They are good, but they are not good enough. We must develop the brainpower to generate more high technology. The universities may not even be the place to do it, because they are not well-equipped for it. It is unbelievably difficult to get anything worthwhile done in a university, partly because of the internal politics, and partly because so many sources of university funding (e.g., state legislatures) are drying up or being curtailed. For the first time in a generation, universities are having to redeploy their assets, and you cannot imagine how hard it is to redeploy assets in a political institution such as a university.

Another problem is the mentality in this country that a college education is the only way to get into a well-paying, meaningful career. Education is not preparation for the future in this country; by and large, education is something people do until the world says, "You can quit that now and go to work." The way education is going, the great mass of American youth will stay in school for sixteen years, learning or doing things that are not very relevant to what they will do after they quit school. We have made education into a consumer good instead of an investment.

It is destructive to have 100 percent of the people between fifteen and eighteen attend an American high school. It is not useless, but it is destructive. That is why the students vandalize the buildings—they are driven to near-insanity. The slow ones do not know what is going on, and the bright ones do not care.

We replicate the situation by having open admission in our universities. It does not make any difference if youth do not learn anything in high school because they do not need to know anything to get into the university. Then they find out, after they graduate with a baccalaureate degree, that if they want to get into a career with much substance, where they can achieve something, they have to go to professional school. We start training in America at the master's degree level.

Only a rich society can afford such nonsense. Now that we are threatened by the productivity of the poor nations of the world, we may have to get our act together and switch gears. Vocational and technical education face the biggest challenge in our society today, and we must start delivering vocational and technical training early, in the grade schools, in the high schools, and in the two-year postsecondary institutions. This will require not only redesigning curricula, but finding the funds to acquire expensive equipment.

One of the reasons people like the general education we offer in this country is that it does not cost much. It does not cost much to teach English or sociology or American history or civics. We put forty students in a room, get an ill-prepared person to stand at the front of the room and talk for an hour, and then we ring the bell. And we do it again and again. The students generally

remember little of what was discussed, nor does it make much difference. Give them an essay exam, and any answer counts; there is no test of skill competency at the end. One student says socialism is great, and another thinks that if Goldwater were president we would save the world, and both answers get an A because they said it well. And that is called education. We have them sit and read Shakespeare—the ones who can read—and they leave thinking that Macbeth is a murder mystery. There is no point in reading Macbeth if that is all they learn.

If we try to redesign a high school curriculum by assigning the teachers from that curriculum to a committee to decide what we ought to do next time, you can bet that they will not design courses in computer programming. One reason is that they know we would have to fire a few of them to find the place to put it in the curriculum; when we change the curriculum, we change the staff. The other reason is that we will not be able to hire a computer programmer for fifteen thousand dollars a year. So curriculum designers will have us keep teaching Shakespeare, poorly, economics, poorly, or sociology, poorly.

You can find all sorts of C students out of poor high schools who will get a baccalaureate degree in education and take teaching jobs for thirteen thousand dollars a year. Teaching positions have a "white collar" attached, and many of these C students came out of the poor rural communities and out of the farms, where the only exposure they have had to the professions is having seen a school teacher. Everybody else they knew wore blue clothes and were dirty. These youth think that if they can be teachers, they will have moved into the professions.

Droves of these young people keep becoming teachers and we can hire them, cheap. But if you want someone who can do computer programming, that person is probably already working at a bank or other business for thirty thousand dollars a year. People like that are not about to come over to a high school or a junior college and start teaching computer programming for fifteen thousand dollars.

The teacher committees we assign to change the curricula at our high schools are going to vote against the computer programming component because, instead of firing two of them to hire two programming instructors, we have to fire five of them to get enough money to hire two computer people. Clearly, teachers are going to reinforce the notion of how essential intellectual preparation for college is, and they will shove the computer literacy problem off to the postsecondary level.

At the postsecondary levels, our community colleges are very likely to fall into an interesting trap. Most administrators and instructors at two-year institutions are trained in universities, and their concept of status and prestige is to make the two-year institutions akin to a university. So as quickly as possible, they want to convert their program areas into two-year associate degrees whose credits qualify for transfer to a university. If they fall deeply into this trap, they soon start teaching more English and Shakespeare and Macbeth, and soon we lose the two-year colleges, too.

We have a tough problem on our hands if we seriously want to revamp the American education system. We have to find the money to buy the equipment and to hire the people who can deliver the technical instruction. That may prove difficult to do in a society that has drifted culturally to a point where few people really believe in achievement except in terms of academics or sports. Or getting rich. All of us want our children to go to a university and get a four-year liberal arts degree so they can go to graduate school—under the mistaken notion that that is the way to get rich. We hope that notion because the rich have always had the money and the leisure to educate themselves. We have come to associate being rich with being educated. But

whereas wealth can lead to being educated, being educated does not automatically lead to being rich. Somehow, we have acquired the mistaken notion that it does.

I am in favor of changing the educational system and getting on with a high-technology economy. What I mean by that is pursuing anything that we Americans are so good at that nobody else can do it. That does not mean training all of the labor force to be engineers. Most of the people who work in high-tech industries are unskilled workers. The people who assemble computers that are so inexpensive because of the new microchip technology are just unskilled assembly workers. They are not the engineers whose brainpower developed that new technology.

We have a dual educational problem and a dual high-tech thrust. We need research and science and we need a few highly skilled technical engineers and mechanical machine maintenance people—maybe as many as 10 or 15 percent of the labor force. But the mass of people who will work in those industries will not have advanced technical skills. For example, the B-1 bomber is a fairly sophisticated aircraft. Rockwell International, which is making parts of the bomber, will need some good engineers, but the company is going to hire mainly high school dropouts to assemble the parts. These people can be trained to do everything they will need to do in six weeks. There will also be a very few skilled people needed to maintain the machinery at Rockwell, and there will be a few people needed to redesign a fusilage, if the company gets a late order change. But the great mass of the people working on the B-1 bombers will be unskilled factory workers.

Vocational-technical education does not have to do anything about the B-1 bomber workers. Of course, some mechanism will be needed to give those people that six weeks of training, but it is not clear whether that should be done in schools or at the factory. It probably does not make a lot of difference. The more skilled workers may need longer periods of training, especially in the science and engineering aspects, and this instruction will probably need to be done in schools. The real challenge, though, is seeing if we can develop these high-tech industries fast enough and market their products fast enough in the world market to provide enough jobs to put our people to work.

We have a society that we need to transform. It is not the responsibility of vocational-technical education to do all of it. But if our society has any sense, it will lean on vocational educators more and more. We have a very difficult war on our hands to change the high schools, to change the two-year colleges, to change their curricula, to change their salary structures, and to find the money to do it all from consumers in other countries. Our taxes are sufficiently high today, and the populace at large probably will not pay another [illegible] billion dollars to do it.

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QUESTIONS AND ANSWERS

Paul Craig

Question: What is your specific recommendation for us, as a research center in vocational education, in terms of all the types of problems you identified?

I am familiar with your assigned mission and somewhat familiar with your political constituencies, and obviously any recommendations I would make that are to be both pertinent and polite have to stay within those bounds. I think your research mission probably should be enhanced along the lines of taking a little more responsibility for defining the mixed job skill needs of the future. I mean as much as a decade into the future, because it probably takes at least five years to implement any worthwhile curriculum recommendations.

Let's say you've designed a really fine training program. By the time you work it into the curriculum end of the teacher training mills and really get something going, it will probably be almost 1990. So the important question is, what kind of jobs will most likely be in demand in 1990? You can't help 1983 very much. Some people may be able to, but that is not your mission as I understand it. You should stand ready to counsel, advise, and help people who ask you questions. From a research point of view, I think that you should find ways to extend your efforts, in terms of what you get away with politically and in terms of funding; or you should find new clients who are willing to fund more research to identify the skill needs in the more distant future.

I do think you can serve society well. For one thing, no one is doing education and employment research very well, so you don't have to worry about looking like amateurs. Everybody in this field is an amateur. You probably have an information base on job-related skills that makes you as competent as anyone else to research the area if you get on with it.

Another thing that you should do, which falls well within your mission, is to give really thoughtful leadership to the retraining of adults. I have two reasons for saying that. The large number of unemployed, middle-aged people is soon going to be a desperate social problem, and a frightening political one, as well. For that reason, it may be easier to get funded for pilot projects for retraining adults than for conventional training programs. Of course, redesigning high school programs and two-year college programs needs to be done to some degree, but that will take a lot of money and work, and it isn't the most acute, immediate part of the problem.

Research and development that targets the very politically potent problem of how to retrain the unemployed, middle-aged adults will also find more funding support and have more success because displaced workers don't want to screw around. A forty-eight-year-old unemployed person who has a family to support and whose unemployment insurance is about to run out is someone whose attention you can grasp immediately. And, because it's a new program, schools don't have to fire the English teacher to get this program started. You don't have to argue with existing college faculty committees for twenty years, because it is always easy to add on a new program. I have discovered, over my thirty years in the university as a dean and department

chairman and vice-president, that you can get everybody to support you to start something new if you are growing. You can't get anybody to help you start anything new if it is to replace something old.

Regarding adult retraining, I don't like to use the word retraining. Most displaced workers aren't retrained; they never were trained. But now you've got a chance to take unemployed steelworkers who don't have any skills and teach them some. That's going to be hard work, but if you can succeed at that, if your model is well developed and your pilot training program works in at least some cases, then you've got a big lever that will help you go back later and pry open the high schools and the two-year colleges.

Now my first recommendation is related to pure research, in a sense; that is, you should find out where we will find the jobs in the future. If you can't forecast those, then you won't know what jobs to retrain people for, anyway. But if you can develop at least some reliable forecasts, then let's try to focus most intensively for a while on retraining unemployed adults for those jobs. If you're successful along those lines, you can then do it for young people.

I happen to think, by the way, that the youth unemployment problem is going to clear up on its own. We've already solved it by getting rid of the youths. The baby boom quit. In the next decade, the number of people fifteen to eighteen years of age is going to decline by over 20 percent. The number of eighteen- to twenty-four-year-olds is going to decline by 15 percent by 1990. So the young adult problem will certainly be less pressing. I think we need to concentrate on unemployed adults.

If I had other specific recommendations, they would probably deal with how we would revamp the existing programs in high schools and two-year colleges, and I am fearful that the constructive things that need to be done there are things that society at large will have to do by changing the status image of those areas of endeavor.

We have got a public image problem. We still have the general notion that vocational-technical education at the high school level is for the dummies. Parents are reluctant to urge their kids into that kind of work, and that is a social tragedy. It carries on over into the two-year colleges and so on.

We have to convince people that you aren't second class if you are in a manual kind of activity or if you are in a blue-collar activity. Now, so-called high-technology, blue-collar work is mostly clean work, so maybe we could just change everybody's collars to white. Maybe Honda is right, workers all ought to wear white coats, so they will all look just like doctors.

Question: You've talked about international competition. As you know, there are different approaches in other countries to relating business and government, and there's also been talk at times about a new convenant between business and government in this country. Are there any changes you would suggest for federal policy that might facilitate the structural changes that you discussed?

It is generally alleged that in Japan (although Taiwan, Korea, and other countries also offer illustrations), the country's economic health was achieved by their government and business working together. Japanese companies got the government to subsidize them or the government to protect them or the government to provide training for them.

This can happen in our country, too. Recently, I was a party to the opening of a new factory in South Carolina. We financed the building with a industrial revenue bond, which means it was very cheap and the state raised the money for us. We have to pay it off, but it was a good deal. Then the state put in a new interstate highway connection that goes right to the factory. The county also rearranged its sewer connections because the factory is out in the boonies and didn't have sewers.

Then, we gave the local community college a list of the kinds of workers we would need. A lot of the work is fairly skilled, as the company builds diesel engines from the ground up. It's not all assembly work. They selected hundreds of applicants and let our personnel department screen them. After we picked the ones that we liked, the two-year college trained them and paid their wages for the first two months on our job until we were sure they were well trained and we agreed to keep them. If we had fired them within that two-month period we would never even have had to pay them to work in our factory.

This approach is fairly common and goes on all over the world. In this country as well as in Japan, different people skin cats different ways. I don't think that we have our problems largely because our government is not sympathetic enough to business. For example, the federal government recently gave the steel industry both tariff protection (with the so-called target prices) and massive tax concessions. That's where U.S. Steel accumulated the money to buy the Marathon Oil Company. So I don't think the world is beating us because other governments are kinder to their businesses. That's my personal judgment about that.

Question: This question is related to the one you just answered. I want to go back to your comments about high-tech advantages and development. It's true that we do have many technological advantages, but in a lot of the cases we have developed them. An example is ceramic engines. If we are going to have to follow up on our technical advantages, do you think there is going to be enough capital to do it?

I think that this country can still generate a great deal of capital. It may take some redeployment of our capital, but if the problem does exist—and it may—there are a number of things that we are in the process of beginning to do that will help generate new capital, though they are very unpopular.

Let me give you an illustration. Take the steel industry. Let's say that we aren't going to help the steel companies again, since they've done to us what they did to us. Those companies gradually are going to go bankrupt. Their capital will erode, their mills become more outdated, and so on. It won't be just because they're filthy capitalists who are stealing money; they aren't making enough because they have lost their competitive edge on the world market.

Now, those companies obviously don't have the money to get into something else, so a new industry has to be financed out of the section of the society that does have profits or does have money. The great mass of that is going to come from the people. The greatest source of capital in America is American households. Each of us does not have much, but the middle class as a whole saves a lot of money. The very rich save a big amount, individually, but there aren't very many of them; the very rich don't really have much capital, collectively. When we need an extra hundred billion dollars, we have to go to people in the middle class and get ten cents from each of them.

One way to accumulate capital is to let the people who have above-average incomes keep it. I mean people who make twenty-five to fifty thousand dollars. There is a myth abroad that these

people are rich. They aren't rich, but they do have options about what to do with some of their income. They can save it or take a big vacation, save it or drive a more expensive car, save it or live in a bigger house. Since saving pays well, right now, I think they'll save more. If, on the other hand, you tax most of that away from those people, they aren't going to save it because they won't have it.

If the government would slow the rate of increase in Social Security payments or curb food stamps or curb subsidies to someone else, that is another way to create more capital. We are trying that a little bit now. Even Democrats were in favor of it a year or so ago, but all of a sudden that doesn't look as politically attractive as it used to.

Another thing the government could do would be to encourage companies to use the capital they do have—whether they get more of it or not—to go into different uses. We put half as much capital each year into residential construction as goes into all private business capital of all forms. What does that mean? It means that even an average working American wants an eighteen-hundred-square-foot, four-bedroom house with two bathrooms, an attractive garage, and central air conditioning. We have come to consider that an American birthright, because politically we have conned people into believing that that's the way everybody will live. So, politically, we have to help them achieve that by subsidizing housing.

If I go out and buy a suit I have to pay for it. If I go out and eat a meal I have to pay for it. If I go out and do almost anything, I have to pay for it. If I go out and buy a house it is a tax deduction. When people borrow all the money for a house it means all their mortage payments are for the interest. Interest is a tax-deductible item, so if you have a government that spawns inflation, the house appreciates, and if the house appreciates in a society that has capital gains tax exclusions, the house becomes a tax shelter. A house is about the only tax shelter that the average person can get ahold of, and so we have seduced most Americans into wasting their capital on big wasteful houses. What we should do is to take away the tax deduction for mortgage interest and not let people deduct their real estate taxes and a couple of other little things. Then people would move back into small houses and we would have the capital to build industry.

It is generally agreed that Norway, Sweden, the Netherlands, Belgium, and West Germany have per capita gross national products equal to ours. We are no longer the wealthiest country. In fact, OECD and UN reports rank the United States about fifth, now, among the countries in terms of per capita income and wealth. But this country has double the per capita housing footage of West Germany and Scandinavia. The Germans don't waste their capital building big houses. We have young couples with no children living in four-bedroom houses as a tax shelter.

There are a few other ways to increase capital for new investments, but they are all equally unpopular. In other words I don't have any great hope that a democracy such as ours has much chance of winning this game. That's why I think the industrial leaders of the twenty-first century will be in Africa and around the perimeter of the Pacific Ocean and Western Europe.

Question: I understand that in Michigan some corporations are lending engineers and scientists to the school districts in an effort to beef up the quality of education of future scientists. Do you feel that this is a viable approach?

It certainly helps. How good it is depends on how many instructors they lend and for how long they lend them. I doubt that the current loans are enough to affect the total system. But it is certainly positive and helpful, and we may wish for that as a stop-gap effort.

I think the problem is much bigger than that, though. Science and math education, which are crucial subjects in a high-tech society, are almost dying in the high schools: Science and math courses are very, very poorly done, so we need stop-gap measures like the one you mentioned, because it will take ten or fifteen years to increase the supply of high school math and science teachers. First of all, we have to get enough students through high school math and science so they can get into it in college. We have got to get them through college and then get them back into the schools. But that means we are going to have to raise teaching salaries tremendously. We don't have the money to raise salaries across the board that much, so we will have to break the teachers' unions so that we can pay differential salaries according to skill.

In an egalitarian society, we don't like that idea. The whole society has been on an egalitarian jag for so long that it doesn't have the stomach to say that Johnny is worth more than Billy. Now that doesn't mean that Johnny is worth more in the eyes of God; it doesn't mean that Johnny will necessarily get to heaven sooner than Billy. It just means that if we weigh worth in terms of whether people can produce what we want, Johnny as a science teacher is worth more than Billy is as a civics teacher. We cannot implement that if we have a rule that says everybody will be paid the same. But we do pay all the teachers the same; they all get seniority raises, and they all get the same seniority raises at the same time. So a civics teacher with only the expertise developed in three beginning-level courses in college is going to get the same pay as someone who can really teach physics. It's dumb. We're going to be in for a long, hard fight.

Question: Do you believe that the developing countries probably can see all the horrendous mistakes that we have made, and what a mess we are in, and so avoid it?

No. Those people don't see us as having made mistakes or being in a mess. They see us as Utopia born again, and they are going to rush to be just like us. Furthermore, every generation in every part of the world will always make its own mistakes; they won't make our mistakes. Our mistakes will be obsolete. They will make new ones.

We all should read Gibbons' book on the rise and fall of the Roman Empire. The classics are wonderful to study because all the classic literature really deals with the political economy of that time. A good classics professor really knows Roman political science, as well as Roman technology, engineering, economics, and Roman society. Classic literature shows us that the ways people have organized themselves and governed themselves and argued over the spoils of labor have never changed, only the technology has changed. The classics can help us understand today, because when we look at what the Romans did, we know they've been dead for two thousand years, and we can see the stupidity of their behavior. Then, just at the end of class when we hear the bell ring, we can say, isn't that interesting—that is just what we are doing.

The developing countries won't learn from us anymore than we have learned from the Romans or from the British. The British welfare state was clearly going down the tubes before we gave LBJ free rein to start the Great Society. It didn't keep us from starting the Great Society.

Question: I would like to clarify the three other things that I think I heard you say would help settle our problems. The first one would be to do away with labor unions; the second one would be to lower wage expectations and the standard of living and health expectations; and the third one would be to train for lower skills development. Is this essentially correct?

Yes. I know those ideas may be unAmerican, very unpopular, and if they were misinterpreted they would place me somewhere to the right of Milton Freedman. But that is not the point. This isn't a matter of left or right or liberal or conservative; if you want to stay competitive in the worldwide game of manufacturing, you have to be able to compete with the other people playing the game. The other people playing the game don't have labor unions, they do have lower wages, and they also have plenty of low-skilled but well-trained workers. In other words, we are competing with Taiwan, we are competing with Malaysia, and we are competing with Japan.

Now, I don't have conservative political views that make me hate labor unions, but labor unions are in the business of raising the wages of their workers. They are political organizations whose leaders are elected to office by promising their supporting workers more. In the long run, they are destroying their workers' interests, because they are pricing those workers out of a job. Has the United Auto Workers helped the unemployed autoworkers? No, the UAW is lying to them, leading them to believe that the big corporations and the government have somehow done them in. Therefore, the unemployed workers not only don't understand their situation, they have been led to misunderstand their situation. The thing that has done them in is that they didn't work very much and got very high wages for not doing much. Therefore, they invited competition. Foreign autoworkers just have to work a little bit more for a little less money and they can beat the socks off of us.

We can stop that by not having international trade. But if we stop international trade, the American farmers, who are among the most productive workers in the world, won't be able to sell their goods abroad, and we will have to shut down most of that industry. Then Ohio, which is one of the most heavily exporting states in the union, will have to shut down a bunch of its industries so that the steelworkers who were laid off could get their jobs back, because we don't let foreign steel in here. Well, if I were an Ohio worker—who, on the average, makes half of what a steelworker makes—I would be sort of peeved if I had to become unemployed to protect someone else's monopoly gain.

That's why I say that something should be done about the major labor unions and their overpricing of their labor. Steel-workers get approximately 75 percent more pay per hour than other manufacturing workers. Are they better than other manufacturing workers? Do they work harder than other manufacturing workers? I don't believe so, I just believe that they were lucky enough to establish a monopoly position at the end of the 1930s with the aid of the government. The same is true of the autoworkers, and the same is true of the railway workers. The railway workers have just about finished off the railroads. We have squandered inestimable wealth replacing the railroads with trucks, which are less efficient. Why did we do it? Because it was the only way around the railroad unions. Now we have to deal with the organized truckers' union.

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