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The Importance of Innovation to the U.S. in the World Competitive Context

*Paul F. Oreffice**

It is appropriate that I am in Cleveland, Ohio to speak about innovation, because without Cleveland the Dow Chemical Company would not exist. Dow was started because Dr. Herbert Dow, while at Case Institute of Technology, discovered a new process to extract bromine from salt brine. He went to Michigan because there are oceans of salt brine trapped underground in Michigan, and he tapped those like you tap oil with wells. After several business failures, the Dow Chemical Company was created in 1897, with money and technology from Cleveland.

The world's technological advances in the last fifty years are truly mind-boggling. They are certainly beyond my imagination. I remember when I first landed in the United States in 1940. One of the first things I did was to go to the World's Fair with my family. At the World's Fair in 1940 we saw a little flickering round screen called "tele-vision." We all agreed it would never make it. It was the consensus of the day that this thing, technologically, was too difficult to perfect to a point where it would become a commercial reality. When we first started talking about sending a man to the moon, the great problem of the day was not how to get him up there, but rather how to get him back. How would we ever get enough fuel up there to start the booster rockets from the moon? So the advances we have seen were beyond the imagination of most people, and it took the inventive spirit of a few individuals to really make them succeed.

Innovation is a way of life. You never think about the advances in medicine like organ transplants, laser surgery, heart bypass operations and microsurgery. Some new drugs improve our lifestyle, others are life-saving. In this century, life expectancy has gone from thirty-eight to seventy-six years. The advances are tremendous. The United States has always been strong technologically and we are still the world leader. A great number of innovations have come from the United States. Our research expenditures are very high and will continue, but there are some problems.

I think innovation is being threatened in a very pernicious way by a good set of principles gone haywire — our legal system. Imagine the mad chemist who starts with a small experiment in a glass tube and winds up with foam and smoke all over the lab. That as much as any-

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thing reminds me of what has happened. Our founding fathers presented us with probably the best set of laws in the world, all nicely contained in that test tube. But successive additions to the test tube by judges and others with their own agendas have made the system into a monster that is overrunning the laboratory, and the direct result is a scary reduction in innovation in many fields.

Everything in life entails some risk, but the safest road is usually to repeat what has been done before. Innovation, on the other hand, always entails a risk. The more forward-looking the innovation, the greater the risk.

Legislators would like us to have a risk-free society. Legislators do not want a fault-based system, but simply believe that when someone is injured, someone else should pay, regardless of fault. If all these people had set out to purposely slow down innovation in this country, they could not have done a better job of it. I don't believe the purpose was to damage innovation, but damage it they did. They certainly haven't given us a safer world. As a matter of fact, they have given us quite the contrary. More litigation is keeping safer and better products from the market.

I do not want to give you a litany of examples, but I do want to give you a few examples, because I think they make some important points. In the last five years, over one-third of all U.S. corporations have discontinued product lines because of liability concerns. What is worse, more than one-third admit to deciding against the introduction of new products for the same reason.

The implications are staggering, especially when one looks at the pharmaceutical field. The story of vaccines has been well documented. Only two major companies, Merck and Lederle, are still investing in vaccine research. That's down from sixteen companies twenty years ago. For most vaccines we are down to one producer. The price, in this decade alone, has gone up as much as one hundredfold, all because of potential liability. For the diphtheria vaccine that sells for twelve dollars, the cost of liability is between seven and eleven dollars per dose.

Vaccines are by no means the only example. Our own pharmaceutical company, Merrill-Dow, has discontinued any product that is used by pregnant women, and so have many others. We have discontinued the existing products and all research. In doing this we have denied doctors some very useful products, but the legal and insurance costs were just too high to continue.

We all know of the examples companies and institutions have been willing to talk about. What we don't know is how many simply pulled their resources from this or that field or just stopped researching and didn't say anything, like the company that discovered a substitute for asbestos, better and safer, but decided not to market it because they were too afraid of the liability.

If that isn't worrisome enough, consider this. Lab work is disappearing from U.S. schools because of the liability crisis. Many school systems have given up physics and chemistry experiments that require heat such as the Bunsen burner because they cannot get insurance coverage. Where are our scientists and innovators of the future going to learn? None of these are good trends. All of them hurt innovation.

Before you think that I am just a prophet of gloom, let me quickly add that The Dow Chemical Company will spend more than \$850 million on research and development this year. We are innovators. We believe in taking risks. We believe in discovering and manufacturing new products. We believe in technology. Some of The Dow Chemical Company's better known discoveries include *Styrofoam*, *Saran*, extracting magnesium from sea water, *Seldane* — an allergy product that doesn't cause drowsiness or other side-effects, *Dursban* — a tremendously effective insecticide that is relatively safe to the environment, and several new plastics. There is a broad spectrum of products with a myriad of applications.

Most of our major technical breakthroughs have been made in the United States, but U.S. competitiveness is constantly being put to the test. We sell the same products inside the United States as outside, yet Dow has 55% of its sales outside of the United States. In 1987, the last year for which I have the statistics, Dow was sued 1663 times, seven abroad and all of the rest in the United States. The extra cost in our U.S. business over our foreign business in that same year was between \$120 million and \$150 million. This is the extra cost of insurance, the legal cost of settlements, and so forth. But despite all the problems, U.S. inventiveness has done very well.

When we look at the state of innovation in the United States, we must conclude that we are still the most inventive country in the world. However, it is also fair to say that our lead has shrunk. Of the top forty corporations receiving U.S. patents in 1988, twenty-six were U.S.-based companies, eleven were Japanese, and three were European. Significantly, for someone in my business, fifteen of the twenty-six were chemical companies.

Inventing is not enough. It is just as important to carry the invention to market in a practical fashion and to improve the manufacturing technology. It is in these phases that the United States has sometimes fallen behind other countries in the world. For instance, how many remember that videotape recorders, currently made only in Japan and Korea, are a U.S. invention? There are many other examples where something invented in the United States was developed by others. The Japanese have been particularly adept at taking someone else's basic idea and making it a commercial success through improvements, quality control and great attention to detail.

When it comes to manufacturing technology, U.S. companies in the chemical industry have probably done the best job in retaining techno-

logical leadership through constant innovation. The primary reason why the U.S. chemical industry has had a positive trade balance is that we are technologically the best in the world. Others are good, but we are right up there. I am pleased to say that Dow is in the lead. I think we are the best at designing, building and operating basic chemical and plastic plants.

The creation of our "rust belt" came about in great part because our industry became complacent and forgot that the worst axiom in business is, "If it ain't broke, don't fix it." In practical terms, it is essential to innovate because someone else is probably gaining on you. The example most often cited in our country is the steel industry, which continued to use old methods when new technologies were being developed abroad.

Taking invention, development and manufacturing technology together one must conclude that the United States has been a world leader in innovation. But the real question is whether we will continue to be. If my overall conclusion is that the state of U.S. innovation is quite good, why am I so worried?

I have already mentioned the problems brought about by our liability explosion, but they are not the sole reason for a decline in U.S. innovation. This country is the only country in the world that continues to reduce incentives to research at almost every tax modification. In fact, the 1986 Tax Act actually encourages U.S. firms to do research abroad. The whole regulatory system is set up so that the safe thing for the bureaucracy to do is slow down the process of innovation. The ability to protect our intellectual property in many parts of the world is constantly being put to the test. Without this protection we cannot afford the massive research and development investments that are needed.

So, the bottom line is that while the state of U.S. innovation is still good, we are in for some rude surprises unless some important changes are made. First among these are some major reforms in our tort liability system. Some of these changes are desperately needed. What progress has been made has occurred very slowly, and mostly at the state level. Almost nothing has happened at the federal level.

What are some of the steps needed to help restore innovation to its former level? First, we need to do away with strict liability and return to the negligence standard. In just the last six to ten years we have changed from a standard based on whether or not companies and their employees used reasonable care to a strict liability system which is generally hostile to innovation and change. Second, we need to do away with joint and several liability. The deep-pocket theory has created a tremendous problem for innovation. Third, we need to do away with "junk science." We need to accept what the body of scientists says and not listen to extremes at either end of the spectrum. Fourth, we need to restore the authority of the regulatory agencies, for instance, the Food and Drug Administration ("FDA"). If a drug has gone through the FDA process, has been approved by the authorities and reasonable care has been shown, that

should be an acceptable defense to a product liability claim. Finally, we need to make it more expensive to sue. It is just too easy to bring suit when the plaintiff does not have to pay a defendant company's legal costs. This has resulted in "settlement blackmail," the knowledge on the part of the plaintiff's lawyers that it is just too expensive and time consuming for companies to defend these lawsuits. Companies are willing to pay something just to get out of the lawsuit.

Now, how are we doing on tort reform? As I mentioned before, at the state level we have seen some progress. Not as much progress as is needed, but progress always spawns more progress. Five years ago tort reform on the federal level died within days of being proposed. Last year a bill advanced almost to completion in the House of Representatives. This year we are already seeing people like Senator Biden introducing a new bill, and the House is hard at work on another version. Nothing has resulted yet, but a lot is happening. I have no real hope that we will see a federal bill this year or next, but I think the efforts to resolve the problem are becoming more focused.

In conclusion, over the last century U.S. entrepreneurship and inventiveness have been unique in the world. The distortion in our legal system and the litigious society which that has created are like a cancer eating away at the U.S. ability to innovate. We all need to work toward making major changes in the system if we are to once again be the leaders in the world of innovation.

