

see Lincoln

When Senator Bob Dole and I introduced the what would become the Bayh-Dole Act in 1978, we did so at a press conference where several universities spoke movingly about potentially promising therapies that would never benefit the American public which sponsored the research. The reason? Our universities and non-profit organizations lacked clear ownership rights for their early stage discoveries needed to move the concept to the marketplace.

Prior to passage of the Act, tens of thousands of promising discoveries withered away because previous policies emphasized that results of federally funded R&D should be freely disseminated to further the growth of human knowledge. Many felt that it was somehow unethical for universities and other non-profit research institutions to partner with industry, that such a relationship would of necessity corrupt science. They insisted that Government-funded inventions should be freely available to all under non-exclusive licenses. These policies resulted in 28,000 Government funded patents quietly gathering dust on the shelves of federal agencies in Washington, D.C.

The steady erosion in the 1970's was another unintended consequence of this policy as the United States saw itself falling further and further behind its high technology competitors. Pressure increased to show a greater return than academic papers for the billions invested by our hardworking men and women in public sector research.

Thus, Congress overwhelmingly felt that we needed a new policy providing practical incentives to our universities and small businesses deriving practical solutions to problems such as the tragedy of illness, as well as finding new technologies and methodologies to make the U.S. economy competitive again.

The result was the passage of the Bayh-Dole Act of 1980. The past 25 years of Bayh-Dole illustrate that balancing the traditional research roles of our unparalleled universities and non-profit institutions was a significant factor in the rebirth of the U.S. economy. It is ironic with this success before us that the same criticisms that resulted in the failed policies of the past are again regaining some currency.

President Lincoln aptly stated that the patent system was intended to add "the fuel of interest to the fire of genius." Recently I saw the full quote of our greatest President. Here's what Abraham Lincoln said in his Second Lecture on Discoveries and Inventions:

...In anciently inhabited countries, the dust of ages—a real downright old-foggism—seems to settle upon, and smother the intellects and energies of man. It is in this view that I have mentioned the discovery of America as an event greatly favoring and facilitating useful discoveries and inventions.

Next came the Patent laws. These began in England in 1624; and, in this



Country, with the adoption of our constitution. Before then, any man might instantly use what another had invented; so that the inventor had no special advantage from his own invention. The patent system changed this; secured to the inventor, for a limited time, the exclusive use of his invention; and thereby added the fuel of interest to the fire of genius, in the discovery and production of new and useful things.

It is exactly this fire of interest that was missing in the previous patent policy system. Based upon a misguided, and arrogant, belief that extinguishing the fire of interest would better serve the public, federal agencies took inventions from their creators and gave them away freely through non-exclusive licenses. Predictably, this system failed miserably to produce results; although it probably helped our economic competitors easily search through our best science looking for good ideas.

Ironically, this is where our critics want to return us. From their perspective, innovation looks simple. They seem to believe that companies easily find hidden treasures in our non-profit sector, negotiate exclusive licenses and bottle up science while they make killings in the market.

The reality is quite different. First, university research is a long, long way from a commercial product. Because the vast majority of non-profit R&D is basic, early stage research, any resulting patent is much more like an unproven idea than a product. The companies most likely to aggressively develop such inventions are small businesses which must have strong intellectual property protection to protect their investments. It's a rule of thumb in industry that for every \$1 dollar spent in discovery, at least \$10 dollars will be spent in development. These larger costs are borne by the private sector. And even then, the likelihood of success is small. This is not an exercise for the timid. Yet, once we cut the fetters of bureaucratic red-tape, Lincoln's faith in the American innovative spirit rapidly emerged.

Without companies willing to take significant risks to turn university inventions into a product, the invention will lie fallow, never benefitting our health and wealth.

And what drives our public sector scientists? I firmly believe that the great motivating factor in their lives is conducting state of the art research (which is why they are in the public sector in the first place) coupled with a passion that their research find a practical application.

I well remember the testimony of Dr. Leland Clark, a professor of research pediatrics at the Children's Hospital Research Foundation in Cincinnati, Ohio. Dr Clark's professional life was finding practical solutions to improve the lives of the children and adults facing cancer and serious burns. Here's what he told the Senate Judiciary in strongly endorsing the Bayh-Dole bill:

The point is, as part of the mental process which leads to an invention, the inventor often envisions possibilities for application which are not immediately

evident to others. The inventor's personal persistence and confidence is often the deciding factor which carries the idea forward and prevents the invention from being set aside or ignored.

Our university inventors like Dr. Clark are exactly what President Lincoln had in mind. However, while the Bayh-Dole Act provided the legal framework to turn ideas into useful products, the real work was done on campus.

There is ample evidence that AUTM and others have gathered showing how universities are now integral parts of every state's economic development plans and are significant drivers of new technological development.

Another less mentioned benefit is that the Bayh-Dole Act has strengthened science as well as the economy. A few years ago, the National Science Foundation in its annual **Science and Engineering Indicators** publication lauded the significant growth in jointly authored university/industry scientific papers as a positive step forward for American science. Before Bayh-Dole companies were rightly leery of having their best and brightest perform research with their public sector counterparts for fear of losing patent rights to the federal government. Bayh-Dole lifted this unhealthy barrier to science.

In the 2004 edition, **Science and Engineering Indicators** showed that U.S. patents frequently cite academic articles particularly in the life sciences, but also showing a strong presence in physics, engineering and technology. "This growth in citations of S&E (note: science and engineering) literature, referenced by scientific field, technology class of the patent, and nationality of the inventor and cited literature, provide an indicator of the link between research and practical application." In other words, academic research is strongly linked to technologies growing our economy.

It is no accident that the rest of the world is copying the Bayh-Dole model to energize their economies and make their universities more relevant. It is only wealthy countries that can afford the luxury of having world class centers of learning. We are blessed that many of the brightest minds in the world come to the United States for their education, and stay to work in our research institutions.

Those supporting our public sector institutions through their tax dollars support the advancement of science, but even more, they want a better life for themselves and their children.

Bayh-Dole is making this dream possible. We should be rightly proud of our achievements of the past 25 years. We should also be willing to honestly examine our behavior to insure that we are true to the mission set before us—to increase knowledge while bringing practical solutions to the world community.

I am honored to have been able to play a role in this effort. The illustrations that the Association of University Technology Managers included in this booklet aptly show that we have come a long way. Yet, I must close with a warning that the critics must be

answered. When I opened the hearings on the Bayh-Dole bill, I concluded with the following statement:

The United States has built its prosperity on innovation. That tradition of unsurpassed innovation remains our heritage, but without continued effort it is not necessarily our destiny. There is no engraving in stone from on high that we shall remain No. 1 in international economic competition. In a number of industries we are no longer even No. 2. New incentives and policies are needed to reverse this trend.

The Bayh-Dole Act more than fulfilled our hopes and dreams. Many, many lives are the better for the success our universities and non-profit organizations have had under it. We should never forget this lesson.

Otherwise, as the great philosopher Yogi Berra once said, it will be deja view all over again.