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Event: Research!America National Forum, “Research: The Risks, the Rewards and the Returns.”
Speaker: Lt. Governor Bruce Johnson

Thank you for the introduction Mary (Woolley, President, Research!America). I am pleased that what we are doing to boost Ohio’s high-tech economy has captured your attention and I am honored to have the opportunity to share some of our strategy with you today. I am also humbled to be alongside such an educated and distinguished group of individuals.

I’d also like to recognize the honorable Paul Rogers a long-time friend of the health care community and chair of Research!America. As a former member of the Cleveland Clinic board, he knows something of Ohio’s reputation in the medical field. Also, congratulations to the Honorable John Edward Porter for his selection as the next chair of Research!America.

I must also recognize some Ohio sponsors of today’s event; the University of Cincinnati Medical Center; The Ohio State University Medical Center, The Ohio State University Office of Research, Ethicon Endo-Surgery and OMERIS. My remarks should hit home for these folks because they are all partners in our efforts to grow technology in Ohio.

In fact, Ethicon Endo-Surgery was the recipient of our 2004 Thomas Edison Award. Ohio’s highest technology honor, it is awarded annually to one organization that demonstrates global leadership in fostering or implementing innovation.

The theme for this year’s forum is “Research: The Risks, the Rewards and the Returns.” I like it. In addition to being a nice bit of alliteration, this theme sums up a good portion of those issues that surround the field of research. Since Sir Isaac Newton first got knocked in the head with an apple, science has been fraught with risks. Risk is simply unavoidable when you are dealing with the unknown—the very essence of science.

It is this risk that often causes heartburn when the research community and the public sector come together. There is just something disconcerting about having the words “risk” and “taxpayer dollars” in the same sentence. While logically, the mind can rationalize that the risk is necessary to reap the rewards, it is an emotionally—and politically—difficult leap to accept that when it comes to publicly funded efforts, there will be some failures. In fact, you can imagine the looks I get when I tell someone that we in government are too afraid of failure and that we must be more risky in order to succeed.

Yes, you heard correctly—the guy responsible for jump-starting Ohio’s economy just said the key to success is failure. Well, more correctly, not being afraid of failure.

In Ohio—in fact in America—we no longer have the luxury of being cautious. The world’s economy is changing and if we do not adapt, we will find ourselves in a crisis. A recent

report by the Council on Competitiveness, which discusses the changing nature of innovation, sums it up beautifully. “Innovate or abdicate.”

I won't go into the report's details, as the Council's president, Deborah Wince-Smith, is with us today. However, its observations are not that dissimilar to what we are experiencing in Ohio. Innovation itself is changing. There are more innovators, more places in the world innovation is occurring, and innovation is becoming more cross-disciplinary. In the face of this, we have a choice. Innovate or abdicate.

For those of you not familiar with Ohio, the Buckeye state has a long history of innovation. World-class inventors like Thomas Edison, Charles Kettering and the Wright Brothers called Ohio home. Ohio is the birthplace of the airplane, the cash register and the vulcanized rubber industry. Our innovative contributions to society may well be unparalleled.

Unfortunately, as they say, “That was then and this is now.” In Ohio, we are now faced with the task of reclaiming that culture of innovation in the midst of a changing—and challenging—economy. That's where the Third Frontier comes in.

For the first 100 years of our statehood, Ohio's economy was rooted in agriculture. Our fertile lands and access to waterways ensured that agriculture was king. And it was good to be king. Our population grew, our wealth grew, our infrastructure grew and we were the gateway to the west—before St. Louis laid claim to that moniker. Agriculture was Ohio's First Frontier.

Then came the turn of the 20th century. The age of machinery was upon us. The infrastructure that had served the agricultural era now served the explosion of industry. We had access to raw materials. We had innovators to create quality products and processes, the skilled workforce to do the work and the infrastructure to move the product throughout North America. Manufacturing was king, and it was good to be king. We grew to be the nation's third largest manufacturing state and our gross state product grew to more than \$380 million—making us the 7th largest economy in the nation. Manufacturing was our Second Frontier.

There is just one little hitch in all this good news about our manufacturing strength. For all its strengths in manufacturing, Ohio continues to lose manufacturing jobs.

Let me be absolutely clear. Manufacturing is still king in Ohio. It comprises more than 21% of our Gross State Product. We have 17,600 manufacturing firms employing 850,000 people. We lead the nation in the value added production of primary metals, and rubber and plastics products. We are the number two supplier of fabricated metals and motor vehicles. We remain the nation's 3rd largest manufacturing economy.

The question is “Why isn't our employment growing in line with our increased production?” Well, you don't need to be a rocket scientist to figure it out. (My apologies to anyone in the audience who actually is a rocket scientist.) The answer is productivity. This is not a new phenomenon. Every endeavor man has undertaken, he has gotten better at.

Since 1950, manufacturing production in the US has increased six-fold, yet employment in the manufacturing sector has remained relatively unchanged.

The phenomenon isn't even particular to manufacturing. Productivity affected agriculture in Ohio, as well. Between 1967 and 1983, the number of farms went from 135,000 to 78,000, while production increased from 78 bushels per acre to 138 bushels per acre. What technology and science did for agriculture 100 years ago is being repeated today in manufacturing with computers and automation applications.

Employment in primary metals—which I pointed out that Ohio continues to be a production leader in—fell by nearly half during that same time period, going from more than 155,000 to below 76,000.

Here in Ohio, this increase in productivity has meant a decrease in the percentage of overall employment attributed to manufacturing. It has gone from 20% in 1993 to 15.6% in 2003.

This is not unique to Ohio, or even the U.S., which reported a 17% employment in manufacturing in 1990 dropping to 14% in 2001. Twenty-two million factory jobs disappeared worldwide from 1995 to 2002. The United Kingdom had a shift from 23% in 1990 to 16% in 2001.

And China, the supposed destination for US jobs, has seen its percentage of employment in manufacturing drop from 28% in 1990, to 10% in 2001.

The bottom line is that corporate success in this Second Frontier has been dependent upon making quality goods in a more efficient and less costly manner. As the technology to do this increases, the largest cost becomes labor, which must be reduced—or found more cheaply—in order to maintain the bottom line and generate a profit. We often call this the commoditization of a product. So where then does that leave our economy?

The answer goes right back to what I said at the start—Innovate or abdicate.

In Ohio, we are choosing innovation. In doing so, we find ourselves moving from the Second Frontier—the manufacturing economy to the Third Frontier—the knowledge economy. The Third Frontier is based on the premise that the ongoing success of our economy is dependent upon our ability to continually develop high value-added products—those that are not easily commoditized.

Enter the Third Frontier Project. The Third Frontier Project is a ten year, \$1.1 billion dollar effort to promote the research, development and commercialization of new technology in Ohio.

It is made up of a number of programs that promote collaboration among the public, private and higher education sectors and help companies make the jump from a great idea to a marketable product.

This project is the state's largest-ever commitment to expanding Ohio's high-tech research capabilities and promoting innovation and company formation that will create high-paying jobs for generations to come. Our strategy is designed to build world-class research capacity; accelerate the formation and attraction of technology-based business; promote and support new product innovation; and aggressively market Ohio's competitiveness.

The same scientist whose bump on the head proved there are risks associated with science once said "If I have seen further, it is by standing on the shoulders of giants." Likewise, the Third Frontier Project realizes our future success will only be achieved by standing upon our past successes. We do this by identifying where our current industry strengths intersect with research strengths. This tells us where to begin building our future strengths.

In fact, one of the first things we did was to secure a study by the Ohio-based Battelle Memorial Institute—a member of Research!America—to determine Ohio's existing core competencies. With limited resources, we felt it absolutely critical to our success to know how best to direct those resources.

What we discovered were five areas of excellence—Bioscience, power and propulsion, advanced materials, information technology and instrumentation, electronics and controls—around which we should build the Third Frontier Project.

These five core competencies are at the root of each of the ten or so components of the Third Frontier Project. Each component then addresses slightly different needs as you move from research to commercialization.

Wright Centers of Innovation are large-scale, world-class research and technology development platforms designed to accelerate the pace of Ohio commercialization.

Ohio' Fuel Cell Initiative is supporting projects to prove technical feasibility and lower the cost of fuel cells.

The Third Frontier Network is the nation's most advanced fiber-optic network dedicated to education, research and economic development.

The Validation and Seed Fund program has been particularly successful. Since 2000, the State of Ohio has awarded \$18 million into seed funds and validation funds throughout Ohio, leveraging more than \$150 million in nearly 60 Ohio start-up companies and helping to create more than 400 high-skill, high-paying jobs statewide.

Unfortunately, I do not have time—nor would you have the patience—to list all our programs in detail or to recount all our success. You can visit "ohio.gov" or "thirdfrontier.com" for a full overview. I do think there are a couple of examples I can give that show how we are choosing the path of innovation over abdication.

If the core competencies are the cornerstones of the Third Frontier Project, our Wright Centers of Innovation are its foundation. Their focus is on our areas of core competency.

So far, centers have been established in the areas of power and propulsion, advanced data management, fuel cells, computational medicine, stem cell and regenerative medicine, and molecular imaging.

One such center is the Biomedical, Structural, Functional and Molecular Imaging Enterprise at The Ohio State University. With collaborators Philips Medical Systems and Rexion, the enterprise is developing an ultra-high field MRI scanner—the most powerful in the world.

The development of this enterprise is a great example of the multiplier effect the Third Frontier Project is having. The real success of the Third Frontier is not that we have spent \$235 million on growing technology in Ohio over the last three years. The real success is found in the partnerships that have been formed, the additional dollars we have been able to leverage, and the new technologies that are being commercialized.

OSU's Molecular Imaging Enterprise—just over a year old now—displays all three. They've partnered with Philips Medical Systems, one of the best imaging companies in the world. They've been able to leverage millions of additional dollars, including \$6 million in National Institute of Health funding. And, Philips has added employees, expanded its Cleveland facilities and has received orders for three of the \$6 million “7-Tesla MRI” systems it is developing in partnership with the center.

The other benefit of these types of arrangements is that they help us in the creation of economic development clusters. An area that develops a reputation for excellence in a particular field or industry is obviously more likely to attract other companies in that field--Silicon Valley being the most recognized example of this.

In the case of the Molecular Imaging Enterprise, we are further feeding an image Ohio already has--a strong leader in the area of medical devices. But, in another area, we are starting from scratch.

We are taking steps to establish ourselves as the number one place in the world for the development and commercialization of fuel cells. There are certainly risks with in pursuing such a young technology, but we believe it is a risk that will result in big rewards down the line.

We have the Ohio Fuel Cell Coalition, a group of industry, academic, and government leaders working collectively to strengthen Ohio's fuel cell industry and to accelerate the transformation of the industry to global leadership in fuel cell technology and applications.

We have established a Wright Center for fuel cells—The Wright Fuel Cell Group, located at Cleveland's Case Western Reserve University. Nearly two-dozen companies, universities, and research organizations are collaborators on this project, which will support the research, development and commercialization of fuel cells.

We have developed the Ohio Fuel Cell Roadmap, a strategy to position us as the leader in fuel cell technology. And, in addition to funding numerous private fuel cell projects, we have established the nation's first Fuel Cell Prototyping Center at Stark State College of Technology in Northeast Ohio.

You all know that developing something in a lab or on a small scale is much different than mass production. The Prototyping Center is specifically designed to help fuel cell manufacturers build and operate fuel cells under normal factory conditions.

I think our strategy is working.

Last fall, what we believe to be the nation's first utility-scale fuel cell power plant went on-line. Designed to feed power from a substation into a local distribution center, it is providing enough electricity to power more than 180 homes in my hometown, Westerville, Ohio.

We are creating an image of excellence that has companies looking into Ohio. For example, when Alien Technology, a California company that specializes in radio frequency identification, was seeking a location for a \$10 million, 100 job expansion project, they looked to Ohio. Alien Technology liked the collaborative environment and existing base of companies and talent that existed in Dayton. Not only did they choose Ohio, but they immediately became involved as a collaborator on a Third Frontier Project—the Radio Frequency Identification Application and Education Center.

We've seen stories of commercial success like that of Third Frontier award recipient AlphaMicron, which is adapting its military-application liquid crystal technology for use in the consumer market. The resulting high-tech specs protect skiers' eyes from changes in brightness on the ski hill and were selected by *Popular Science* magazine as the "Best of What's New 2004" by *Forbes* in its "Coolest Ski Gear" article this January.

Last fall, The Ohio State University credited a \$2 million Third Frontier grant for its ability to secure a \$12.9 million National Science Foundation award. As a result, scientists there are creating the Nanoscale Science and Engineering Center.

Perhaps most importantly, though, we've seen stories of personal triumph like that of Annette Coker of Toledo, the victim of a terrible car accident that left her quadriplegic. Thanks to the Cleveland Functional Electrical Stimulation Center, a recipient of \$8 million in Third Frontier grants, Ms. Coker is regaining her independence. A surgically-implanted neuro-prosthetic has restored some movement to her left arm, allowing her to handle everyday items like a pen, toothbrush and fork.

While the Third Frontier Project is shaping up to be a powerful economic development tool, I must warn you that it is only that—a tool—one tool. It is not a silver-bullet that will magically transform our economy overnight.

It is a long-term project that must work with other tools and programs. It works because it builds upon other successful programs like our Edison Centers and Technology Incubators,

which help emerging companies overcome specific technical challenges and provide assistance in growing their business. We maintain a whole array of basic business incentives to encourage company location, expansion and investment in new machinery and equipment. We've reformed our civil justice system, our worker's compensation system, and are pursuing tax reform that will further encourage companies to invest in their Ohio facilities.

And, perhaps most importantly of all, we are partnering with our higher education system the entire way. In fact, the Chancellor of our Board of Regents is one of the three people who sit on the Third Frontier Commission and help decide how it is run.

It is absolutely critical that higher education be a part of this. Statistics on the US position in higher education are not encouraging. The Task Force on the Future of American Innovation recently issued a report warning that the US is in danger of losing its leadership position in science and innovation.

Much of its claim is predicated on education in regard to science and engineering. More than half of all workers with science and engineering degrees are over 40. And new blood is not entering the workforce fast enough. From 1994 to 2001 graduate enrollment in science and engineering decreased 10% among US citizens. These are issues that require much more time than we have here today, but they are issues we must be preparing to address.

We think the Third Frontier Project will help us in Ohio. The majority of its elements rely on—and benefit—the university structure. This structure is still home to a good majority of research, and is still where good ideas are born.

The Third Frontier Project recognizes this fact. It accepts the premise that risk is always a possibility. But the Third Frontier Project also understands that, when it comes to ensuring a bright future for our children and theirs', we cannot afford to abdicate. Risky or not, we must choose instead to innovate.

Thank you, and I look forward to discussing this more during the panel.