Land-grant universities—leading the evolution of agriculture

When Purdue University was founded in 1869 with the teaching of agriculture as one of its central missions, the United States was still primarily an agrarian nation. The majority of Americans either lived on farms or raised a significant portion of their own food. They did most of their traveling on foot or horseback. Their understanding of things like nutrition, sanitation and food preservation was primitive.

The land-grant university system was created, in part, to make Americans better farmers by teaching them modern agricultural techniques. As so often happens with education, the results were much different than expected. Our nation has gone through a vast economic and cultural change since 1869. Today, the proportion of our people who farm for a living is estimated at 2 percent. That small number of Americans feeds our country and a large part of the rest of the world. This incredible productivity frees the rest of us to use our energy and creativity in other ways. It is the very foundation of our prosperity.

By making food and fiber production more efficient than anyone ever dreamed possible, Purdue’s School of Agriculture and its counterparts at other universities drastically reduced the number of people who call themselves farmers. However, this has not lessened the need for agricultural education. In fact, Purdue Agriculture is growing, and its role has never been more important.

This apparent paradox is explained, of course, by the fact that new knowledge created through research has produced a vast range of products, services, careers and opportunities. People who study agriculture at the dawn of the 21st century prepare for careers in science, business, engineering, education, environmentalism and many other fields, in addition to farming. No academic discipline is more diverse, exciting or important to our future.

Leadership in agriculture remains one of the pillars of Purdue’s excellence. The articles in this issue of Agicultures provide evidence of this leadership. We can never be sure what the outcomes of education will be, but if we commit ourselves to pursuing quality and integrity in teaching and research, we can be sure that good things will happen. Purdue’s agricultural tradition has proven that point for nearly 130 years.

Steven C. Beering
President
Purdue University
Lactose intolerant? Drink more milk
Taking care of caregivers
It’s a good time to be a Purdue Agriculture grad
Unlike adults, infants and toddlers need fat in diets
Cut with the old; in with the new
Food for thought
Comfortable seats, uncomfortable predictions

Urban roots in agriculture
No hog heaven in the Hoosier heartland
Phosphorus: too much of a good nutrient?
Out with the old; in with the new

Science literacy for us all—it’s elementary
Science literacy for us all—it's elementary

Karl G. Brandt, Associate Dean and Director of Academic Programs

“I have no data yet. It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts,” asserts Sherlock Holmes in “A Scandal in Bohemia.”

Regrettably, the facts are in. The data are available. Once again, “The Wake-Up Call We Dare Not Ignore” is the headline of an editorial in a recent issue of Science. The article reports that “U.S. 12th-graders performed below the international average and among the lowest of the 21 countries that participated in the general science knowledge assessment.” But this ought not be news. We have seen similar headlines many times in recent years. How can we have ignored the data?

Perhaps the problem isn’t that we aren’t all aware of the data. Perhaps the problem is that too many people simply haven’t been motivated to do anything about it. Or perhaps, too many don’t think it’s important to do anything about it.

Let’s talk about why it is important.

I drive down the street. When I turn a corner sharply, I feel the pressure of my seat belt and think “physics.” I see a 20-foot-long branch extending horizontally from the trunk of a tree, marvel at the stress its mass—even without a load of wet snow—places on the limb next to the trunk, and think “physics.” Neither my seat belt or the tree trunk had to do anything about it. Why should I?

I know that water dissolves a lot of different chemicals, some of which we like (sugar, for example) and some of which—at least in some ways—we don’t (nitrates). Water doesn’t have to study chemistry to accomplish this feat. Why should we?

There are several important reasons I can offer for why we should study mathematics, biology, chemistry and physics. You cannot read a newspaper or a weekly news magazine today without encountering an argument based upon statistics. How do you read that article critically without some knowledge of statistics? Or do you just trust the journalist? Maybe you just skip the article all together.

You are constantly bombarded by the media, or by advertisements published in the media, with health claims about this or that product. How do you evaluate the claims? We have seen a rash of new diseases emerge, some caused by identifiable pathogens and others by unknown agents. How do you rationally assess their danger to yourself?

Daily, you encounter dire warnings about the effect of various substances on the environment—on plants or wildlife, on water quality, on the ozone layer. How do you critically examine the meaningfulness of those warnings? Dare you simply accept them at face value?

A citizenry educated to participate meaningfully in decisions about its own health, about the safety of its food, and about the effect of humans and our practices on the sustainability of our environment must understand something about science—I assert that more is better—and understanding science inevitably means mastering mathematics.

Frankly, I’m selfish enough to want those voting on my welfare and on funding for science to understand something of what they are voting on. Don’t you?

Can we agree, then, that understanding science and mathematics is important? If so, we have to be very much alarmed by the data replicated in a succession of tests that demonstrate the next generation is poorly prepared in those disciplines. So we do have a problem.

Now, Sherlock will let us theorize about its cause and possible solutions. I would like to suggest, for openers, that all high school students should be required to take at least four years each of mathematics and laboratory science. But the most important thing for each of us—and our society as a whole—to own up to is that we’re all in this together. We need to take the steps necessary to ensure that our children are exposed to science at an early age and in an accessible and stimulating way. We need to find ways to keep that interest alive throughout their lives. We all don’t have to be scientists, but we all should be able to appreciate the myriad ways that science intersects our lives. Every one of us—parents, teachers, students, legislators, taxpayers—has a stake in finding ways to solve the problem identified by the data. We’ve been wringing our hands for far too long.

We must insist that science and mathematics be taught and taught well in our schools. We must agree that it is essential that all of our young people aspire to understand the world around them through the study of science. It will require commitment on our part as parents and educators, and it will require diligence and discipline on their part as students.

Do you have an alternative hypothesis or theory?