

by Scott P. Richert

Manufacturing Our Future

Last month, I discussed what the future of manufacturing in the United States will have to be, if manufacturing in the United States is to have a future; this month, I can say with some certainty that I have seen the future of manufacturing, and it is here in Rockford.

Before you laugh and turn the page, let me hasten to assure you that the caveats I noted last month apply. The end of manufacturing cannot be production for production's sake, nor for the sake of ever-greater profits. In a global economy, in which the United States is competing with countries with low wages and few or no regulations, those are models for failure. Efforts at increasing efficiency and trimming marginal costs have their limits—some natural, some imposed by government and by the economic expectations of American workers.

Cut marginal costs too much, and your customers may find that, under normal conditions, the heads snap off one out of every ten screws, instead of one out of every hundred. When that happens, all the brand loyalty that you built up over the years can vanish overnight. Not only are customers no longer willing to pay a premium for your screws, they may switch to a different, non-Rockford (even non-American) product altogether. Good luck getting them back: It is a lot harder to introduce a “screw classic,” made with the former tougher (and more expensive) alloy, than it is to return to the original recipe for sugared water.

This is not an entirely hypothetical discussion. Rockford was once known as the Screw Capital of the World, but today that title is most often used sarcastically, if at all. Attempts to gain market share and to compete against lower-cost (and lower-quality) foreign products sealed the fate of this sector of Rockford manufacturing.

But there are different models that manufacturers can pursue, as the his-

tory of Rockford's rise as a manufacturing powerhouse in the late 19th and early 20th centuries proves. What was the secret to Rockford's success? Profits took a backseat to a love of tinkering and innovation. Howard Colman created Rockford's first multinational corporation (the Barber-Colman Company), but that was not what he set out to do. Rather, like the much better-known but hardly more impressive Thomas Edison, he loved working with his hands and creating things that others had never dreamed of.

By the end of 1912, residents of Rockford (founded in 1834, chartered as a city in 1852) had been granted over 600 patents by the U.S. Patent Office, a remarkable figure considering that the citizens of the much older Northeastern industrial states of New York, Connecticut, and Massachusetts had received only about a thousand patents for each entire state. Colman himself racked up an amazing 149 patents and assisted others in obtaining dozens more. The economic success of the city followed innovation, not the other way around.

That is not to say that Rockford manufacturers did not care about making a profit. Of course they did. And having made a profit, they wished to make more. But there is truth in the old adage, “Build a better mousetrap, and the world will beat a path to your door.”

Here's the funny thing, though: If you have a better mousetrap, you do not need the world to beat a path to your door to make a living—and a good one at that. In any age, some people are willing to pay more for quality. Others, of course, will not, even if they can afford it. The market naturally divides into niche markets, with relatively higher marginal profits, and mass markets, where companies make up for lower margins through volume. Now more than ever, manufacturers need to decide which market they wish to serve.



Most large companies today still prefer market share over higher profit margins. That is the Microsoft-Walmart-McDonald's model, and there is no denying that all three companies have made astounding profits over the years. Yet Microsoft is hardly known for innovation; its stock performance over the past several years has been subpar; and within the next year, it may be passed in market capitalization by Apple, a company whose market share, even after almost five straight years of growth, remains dwarfed by Microsoft's.

Apple's award-winning chief designer, Jonathan Ive, has often said that the company does not consider price or profit margins when designing its products. Instead, Ive and his team try to design something that Apple's employees would want, and so they focus on ease of use, durability, and aesthetics. Then, once they have done everything right, they decide if they can price the product at a point that will allow them to make a decent profit and to finance the development of other best-of-class products.

Designing the best-selling smartphone in the United States isn't a matter of pressing pork parts to make a McRib or crippling an operating system to make seven different versions of Windows Vista or determining whether dropping the final digits of a product's price to 88 from 99 will increase sales. Ive's efforts are closer to the spirit of Howard Colman, who wanted to know how things work and how he could make them work better—and, in so doing, made a living for his family and for those who depended on him.



That is the spirit that needs to be revived if manufacturing is to survive and thrive in the United States. And the attempt to instill that spirit in the next generation of Rockfordians is what I witnessed in late July at the 2009 Techworks Manufacturing Camp.

Sponsored by Women of Today's Manufacturing, the PACCAR Foundation, and the Rockford-based Fabricators and Manufacturers Association, the manufacturing camp for eighth, ninth, and tenth graders has been held each summer for the better part of a decade. For the absurd fee of ten dollars each (all materials, lunch, and snacks included), ten students spend 20 hours over the course of a week learning the basics of the industry that made their hometown (and their country) prosper.

This is not a mini vocational-tech program but an attempt to show teenagers that manufacturing is about much more than assembly lines and machining (though the students all use machine tools during the course of the week and take factory tours on the final day). In every session, the instructors stressed the need for the students to work hard at their studies—not only in math and science, but in the liberal arts as well. A spirit of intellectual curiosity goes hand-in-hand with mechanical innovation.

This year's camp was held at the EIGERlab, a research and development center where local educational institutions and private industry collaborate. That gave the students ac-

cess to rapid-prototyping machines, including 3-D printers and plastic fabrication units, which in as little as an hour can turn a computer-aided design into a working sample. Such advances in technology can cut weeks or even months off of the time that it took Howard Colman to transform one of his visions into reality.

What such machines cannot do, however, is dream up those visions. Curiosity, imagination, and ingenuity will always be necessary. But in our mass-manufactured world, those human qualities are in increasingly short supply.

At the Techworks manufacturing camp two years ago, former *Cheers* star John Ratzenberger told the students how, as a child, he loved taking things apart and putting them back together, and creating new objects out of wood and metal. Fed a steady diet of video games and television, children today miss out on this rite of passage, and that dampens or even extinguishes the flame of invention.

For five years, Ratzenberger hosted *Made in America*, a cable show that profiled outstanding American manufacturers, including several in the Rockford area. Inspired in part by what he saw at the Techworks Manufacturing Camp, he helped found the Nuts, Bolts & Thingamajigs Foundation, which, among other activities, funds similar camps around the United States. (Nuts, Bolts & Thingamajigs has now merged with the Fabricators and Manufacturers Association and is

based here in Rockford.)

Each day of the manufacturing camp ends with a lunchtime speaker who explains to the students why he or she chose manufacturing as a career. The speaker on the final day was Brad Harrison of Harrison Harmonicas (*HarrisonHarmonicas.com*). While the United States is the world's largest market for harmonicas, Harrison Harmonicas is the only American manufacturer of the instrument. Harrison achieved this distinction the same way that Howard Colman built the first multinational corporation in Rockford: He began tinkering. Dissatisfied with imported harmonicas, he started customizing them, and, as he told the *Chicago Journal* (April 12, 2009),

When you customize, you learn all of the mistakes that the manufacturers are making. It got very frustrating thinking all I'm doing is fixing these manufacturers' mistakes. Why don't I just start my own factory?

In this first year, Harrison expects to produce about 10,000 harmonicas—a drop in the bucket compared with the seven million or so that are sold every year in the United States. Yet, since his customized harmonicas have been prized by such musicians as John Popper, Bono, and Bruce Willis, Harrison should have no trouble capturing the niche market of high-end (\$160 to \$180) instruments.

The students were impressed when Harrison told them that the machines he had used to prototype his designs were the ones they had used earlier in the week. They were more impressed, however, by the story of how a professional musician who had toured for a dozen years gave it all up to create something that will last. In a world filled with mass-produced plastic junk that you can easily tear apart but can never put back together, a finely crafted instrument, or a piece of furniture, or a tool that can be passed from father to son to grandson may still have the ability to inspire some young people to attempt to make their own dreams into reality. <