

Workers Transformed!

Complex Machines Turn Blue Collars White

BY CLARE ANSBERRY

Staff Reporter of *The Wall Street Journal*

Paul Koch comes from a long line of blue-collar workers. His great-grandfather left Germany to settle in the U.S. as a toolmaker, a craft handed down to his sons, grandsons and great-grandson. Along with thousands of others, they collectively created an industry and identity for Erie, Pa., as a major tool-and-die center.

Mr. Koch took a different path to the same field. He earned a Ph.D. and started the plastics engineering technology department at Penn State University's Erie campus to teach a new generation of manufacturing workers. They study plastic design and plastics processing and travel abroad to gain global perspectives of the seemingly mundane world of injection molding. Graduates go on to create plastic parts for surgical devices, computers, cars and toys, with starting salaries of as much as \$50,000 a year.

These are the new blue-collar workers, although the term seems almost a misnomer today. Recorded first in the 1940s, it described the color of the shirts worn by factory workers, blue preferred over white because it better hid the dirt from the soot-filled air. Over time, the term came to describe a way of life and it split the working world neatly into two: White-collar workers used their heads; blue-collar workers used their hands.

Automation and Globalization

These days, blue collar still means manufacturing, but technology and globalization have transformed it dramatically. Gone are traditional assembly jobs that required little skill and less education, those tasks being automated or sent overseas to less-industrialized countries. Remaining in the U.S. are blue-collar jobs involved in making products with proprietary technology, or items that require frequent tweaks and updates. These workers make goods that are perishable or too bulky to ship and thus must be close to the market: Bread and frozen foods; custom furniture, innovation-intensive computer components or refined hospital devices using technology a company wants to protect.

Today's blue-collar workers are more involved in customized manufacturing, coming up with solutions to a particular customer's needs, rather than churning out standardized parts and commodities. Workers need to be able to think globally, too. An engineer at **Timken**, a century-old bearing maker, whose team once would have been limited to his Canton, Ohio, plant, now collaborates with colleagues at a Timken plant in Romania to design and make bearings for a client in China.

The world of blue-collar work has changed as well. What once took two weeks and a dozen workers now takes two people only a few hours. Jobs once considered a lifetime commitment are now more temporary, forcing workers to stay adaptable. Many of them move from one factory or plant to another, from day shift

to nights to keep up with changing demands.

Automation and globalization haven't only reshaped jobs, but eliminated many, too. The manufacturing sector lost about two million jobs in the past two years alone. Overcapacity, global competition and rising labor costs make blue-collar work particularly vulnerable to global boom-and-bust cycles.

Those cycles have whittled away the promise of security that characterized blue-collar life. Twenty years ago, on the factory-lined rivers of southwestern Pennsylvania, unemployment doubled to 18% in one year. Blast furnaces, some 17 stories tall, went out for good. As they did, parents, some of them blue-collar workers themselves who had stood in the unemployment line, urged their children to shun factory work. High-school graduates in working-class neighborhoods began to bypass welding and other trades. The loss of status for this way of life is so profound that recently in a Midwest survey of 18 possible career choices among students, manufacturing came in dead last.

Reinventing Itself

Interestingly, though, today's blue-collar jobs are generally safer, more demanding and better-paying than they were even a generation ago, although the pace of wage increases has slowed and benefits are eroding—as they are in the general workplace. Manufacturing jobs averaged \$54,000 in total compensation in 2000, 20% higher than the average of all American workers. What's more, while the percentage of the U.S. work force in manufacturing has dropped significantly since 1950, the actual number of jobs in the sector is the same as it was then—roughly 16 million—and these workers are doing far more than ever before. Manufacturing output soared 47% during the past decade and productivity grew two to three times as fast as the overall economy from 1973 to 2000.

That demonstrates manufacturing's ability to keep reinventing itself—both for survival and to meet the world's growing appetite for more and better products. A surgical appliance that detects small tumors needs to be made even tinier. Even mature industries like apparel and steel are carving out high-tech niches with developments such as **Gore-Tex** fabric or bacteria-repellant steel, for use in medical devices.

The notion that automation will create, rather than eliminate, manufacturing jobs seems counterintuitive, but it's not entirely untrue. Machines have indeed reduced the number of jobs involved in production, with many of the lost jobs—but not all—involving repetitive and often dangerous functions. But someone has to build those increasingly automated machines and the parts for them, and then improve upon them.

Nationwide, about 42% of manufacturers say they face a serious shortage of highly skilled machinists and craft workers. One study shows that 10 million new skilled workers will be needed by 2020 as many retire and few enter the field.