

**ECONOMICS, LABOR, & BUSINESS**

suggests that as of last January, 1.6 million American workers were permanently "displaced" from their jobs, due chiefly to an influx of Japanese autos, Brazilian steel, and other foreign goods. But that figure includes *all* workers laid off or fired in declining industries. Once the economy picks up, Ehrbar contends, most of them will return to work.

A better measure of the "displaced" is the number of unemployed who had 10 or more years on the job and have been out of work for at least six months: 60,000, or some .5 percent of the 11.4 million unemployed.

The-sky-is-falling estimates of future "displacement" will prove equally wide of the mark, Ehrbar believes. Pat Choate, a senior analyst at TRW, Inc., predicts that 10–15 million blue-collar jobs will vanish by the year 2000 [see *WQ*, New Year's 1983, p. 40]. He pins part of the blame on industrial robots, whose numbers he expects to grow from a few thousand today to more than 200,000 by 1990. But other studies peg the total robot population in 1990 at a maximum of 150,000—and a low of 70,000.

Ehrbar adds that the long decline of America's "smokestack" industries now appears to have bottomed out. Between 1950 and 1978, their share of all U.S. employment fell from 34 percent to 24 percent. But the U.S. Bureau of Labor Statistics predicted this year that the proportion will drop no further during the 1980s, and that the absolute number of manufacturing jobs will *increase* by five million by 1990.

In Ehrbar's view, the massive national job retraining programs sought by Choate and his allies are not needed. U.S. corporations already spend \$30–50 billion annually on employee education, much of it for retraining; as the Baby Boom generation matures and labor markets tighten, businesses will have even stronger incentives to retrain their few "displaced" employees. Federally funded programs to match people with jobs could help those who fall by the wayside.

It will be a very long time, Ehrbar says, before the only jobs left in America will be sweeping up after the robots.

## *Electrifying U.S. Factories*

"From Shafts to Wires: Historical Perspective on Electrification" by Warren D. Devine, Jr., in *The Journal of Economic History* (June 1983), Eleutherian Mills Historical Library, P.O. Box 3630, Wilmington, Del. 19807.

A century ago, American industry was just beginning to switch from steam to electric power. By 1930, most American factories had plugged in, spurring a complete physical overhaul of the shop floor that revitalized the U.S. economy.

The typical 19th-century factory was powered by a single "prime mover" steam engine, fed by coal, which turned several main line shafts that ran along the ceiling of each floor for the length of the building. These were connected by pulleys and leather belts to subsidiary shafts, which were in turn belted to the production machinery.

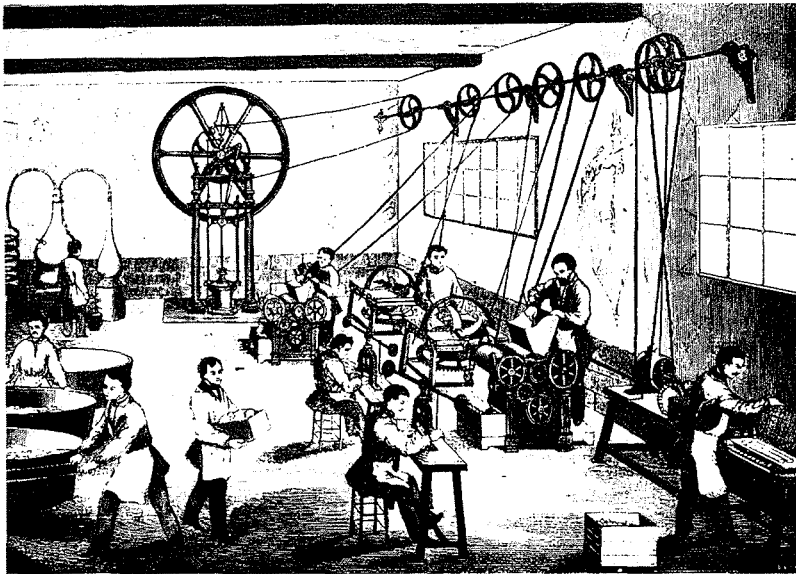
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The "direct drive" system, says Devine, an Institute for Energy Analysis researcher, was enormously inefficient. It needed constant maintenance, required inflexible arrangements of machinery on the shop floor, and squandered energy, because using even one machine meant turning on the whole system. Worst of all, if the prime mover broke down, the whole factory came to a standstill.

The first electric motors were no remedy—factory owners simply used them as new prime movers. But during the early 1890s, H. C. Spaulding of Columbia University pioneered the concept of "group drive," arranging machinery in small groups around short drive shafts, each powered by its own electric motor. Yet in 1900, 80 percent of American factories still ran on steam.

Two developments speeded steam's retreat during the next decade—the advent of individual unit drive and the spread of electric utilities. (Most early users generated their own power.) By 1920, electricity was driving nearly 60 percent of American factories; by 1930, 80 percent.

Energy savings were not the chief lure of the new technology. Unit drive let manufacturers deploy machinery according to the demands of the production process, not those of the drive shaft, saving valuable floor space. It reduced the threat of complete shutdowns or fire (and thus the cost of fire insurance). And, by liberating the factory from the prime mover's inflexible array of drive shafts, it made plant expansion easier.



*This 1850 steam-powered soap factory was organized to accommodate a single line shaft that drove all the machinery on the shop floor.*

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The results were dramatic: Labor productivity nearly doubled during the 1920s, as factory owners installed electric machinery and learned how to use it better. At the same time, electrification reversed an ominous 20-year-long decline in U.S. output per dollar of investment.

### *No Experience Necessary*

“‘Corporate Kidnap’ of the Small-Business Employee” by Bradley R. Schiller, in *The Public Interest* (Summer 1983), 10 East 53rd St., New York, N.Y. 10022.

Newspaper “help wanted” ads always seem to say, “Experience required.” How does the first-time job-seeker get such experience? Mostly in small companies, which in effect subsidize job training for America’s big corporations.

Hiring and breaking in a new worker can cost up to \$10,000, according to Schiller, an American University economist. Since most companies, large and small, lose 15 to 20 percent of their work force annually, five out of every six “new hires” are replacements, not recruits for newly created jobs. Big Business minimizes costly employee turnover and training by hiring more reliable, experienced personnel, many of them “kidnapped” from smaller companies.

To prove his point, Schiller cites his 1982 study of Social Security data on 2.9 million young men (average age: 19) for the U.S. Small Business Administration: Two-thirds of them were first hired by firms with fewer than 100 employees, only 11 percent by Big Business (companies of more than 1,000 workers). After nine years, only 1.2 percent of all the men were still with their original employer. Most had moved to companies of about the same size. But small business suffered a net loss of 301,000 workers to larger firms. Nearly half of those who moved up were hired by Big Business.

In smaller companies, workers do not always acquire sophisticated skills. Gas stations, fast-food restaurants, and local merchants were typical first employers, and they paid an average starting salary of \$5,878 (versus \$11,407 for the largest corporations). But less tangible gains—in punctuality, self-discipline, organizational ability—are no less valuable.

Big Business can easily skim the cream off its little brothers’ labor force: The salary gain for workers “moving up” to larger firms averages 23 percent. The 30,000 newly trained young men whom small business loses to big competitors each year represent an investment of at least \$200 million.

Collectively, small businessmen provide the nation’s number one job-training program. And Schiller believes they could hire even more newcomers if their labor costs were reduced—by tax cuts, a lower minimum wage for youths, or federal training vouchers. Yet Washington has long focused its hopes and its job subsidies on large corporations. With youth unemployment now at 23 percent, federal money would be better spent to help the local storekeeper beef up his work force.