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## LABOR AND THE NEW INDUSTRIAL REVOLUTION

= by Chris Martin =

In the past few years we have seen an amazing transformation of technology. Electronic circuits have shrunk to microscopic size while their complexity has increased unbelievably. The new technology has already changed our lives but the greatest changes are still to come. In the factory and office of the future will machines free workers from dangerous and dull tasks? Will workers receive their share of the increased productivity through shorter hours and higher incomes? Will more challenging jobs and higher quality products change work and leisure for the better? In the September issue of Scientific American, specialists describe their views of the future of work, giving cause for both hope and worry.

### New Tools and New Processes

At the heart of the new industrial revolution are memory chips, which can store tens of thousands of bits of information. Microscopic computers place information in the memories, retrieve it from them and transform it so humans and machines can use it. Together they can control mechanical devices which perform complex tasks, some too intricate or heavy for a human worker. They also form the heart of information and communications systems with fantastic capabilities.

How will the new tools be used? Automated assembly lines could take over repetitive work. Servo-mechanisms could copy the actions of a human operator on a larger or smaller scale. Workers could use these devices to do dangerous jobs, like nuclear power plant repairs, at a safe distance. They could also use them to do small and large scale work "By hand." New design and machining systems could put the brain power of the computer at a worker's disposal. Computer Aided Design-Computer Aided Manufacturing (CAD-CAM) systems can allow workers to test parts on the computer even before they have been made. The new tools could offer workers greater scope for their abilities and challenge them with new skill and training requirements.

But this may not occur. If production runs are long, the writers in Scientific American tell us, fully automated assembly lines will be cost effective. Otherwise human workers will be needed to place workpieces in the machines and clear jams. The jobs will still be dull, only the number of workers will decrease. Since remote control devices are expensive, managers might simply continue to use itinerant workers for hazardous jobs. Most of the industries which have adopted CAD-CAM are using their systems to produce standard, mediocre products and cut the employment of skilled design workers. Will this be a new age of cheap labor and bad jobs?

### The Information Economy

The new technology can transform the production and use of services. An office worker can now get a client's entire file from the computer and change it with simple commands. Instead of doing one task, for many clients, like filing, workers could do many tasks for a few clients. Skilled office workers would have more time to spend on customer relations and internal communications. The changes might bring more recognition to undervalued services. New channels of communication could bring factory workers in touch with sales representatives so that companies could cost out bids more effectively and improve products.

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Better information can also be used to restrict workers. Some office workers now find that their time on the job and their output are being recorded for inspection by numerous electronic and human supervisors. With the new systems, managers can speed up clerical workers. They can also develop a new group of home workers with terminals instead of sewing machines. In the factory a better information system may mean more uncertainty about employment. Managers could order parts and products from anywhere in the world and get them quickly. Some companies have begun to use the Japanese "Kanban" where parts are ordered only after the customer orders a product. Instead of keeping parts and products on hand, companies could keep stocks of workers waiting by the phone.

#### Income and Jobs

In the final article of this special issue of Scientific American, economist Wassily Leontief raises the question of employment and income distribution. Europe and the U.S. are experiencing depression levels of unemployment. Leontief warns that unless workers' leisure time increases the new technologies will raise unemployment even further. Some way must be found to redistribute income and employment-- and will be found, according to Leontief.

Unfortunately, the Scientific American articles raise serious doubts about Mr. Leontief's optimism. Workers have never been able to depend on the good will of managers for their incomes. They have had to organize economically and politically and to bargain hard for their gains. As now applied, the new technology is making many skills useless without creating enough demand for new skills. New information sources make it possible for companies to have many plants with only a few workers in each. These changes will undermine the ability of workers to meet, organize and bargain. If organized labor is weak, it will take more than hopeful optimism to save us from another Great Depression.

The Wagner Act of 1935 made it possible for unions to organize the new mass production industries. But a new law is now needed for the "Information Age." Union organizers need better protection against violations of their rights. They need the right to organize even in the extended workplace, where hundreds of home workers will be linked by their terminals and phone lines. Since information is becoming so inexpensive and available, unions need better information from management. They need to change their own organizations so they can use this information more effectively.

In the long run, labor must consider changes in the use of technology. In Sweden the national union is now sponsoring a group of computer scientists, sociologists and workers who are designing systems which use and develop workers' skills to produce better quality products. If technology is to become our servant and not our enemy, new programs of industrial innovation must begin to use and develop workers' skills, rather than trying to do without them.

- Chris Martin

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