

# Pregnancy Transfers

## By A.T.&T.

### Miscarriages Feared After Study on Chips

By DAVID E. SANGER

The American Telephone and Telegraph Company said yesterday that it had banned all pregnant women from its semiconductor production lines, in response to a University of Massachusetts study that found a sharply higher incidence of miscarriages among workers who produce "computer chips."

The action by A.T.&T., one of the world's largest semiconductor manufacturers, makes it the first company to remove workers from "clean rooms," as the chip-fabrication areas of the American microelectronics industry are known.

In recent weeks, as the results and unanswered questions arising from the study have circulated throughout the semiconductor industry, numerous manufacturers have offered pregnant women the option of moving out of the production areas where silicon chips are etched with strong solvents and acids and exposed to gases that give the components their unique properties.

Both doctors and industry executives say they are mystified about the precise cause of the high incidence of miscarriages — nearly twice the rate found in the general population — study was initiated by the Digital Equipment Corporation, one of the nation's largest computer makers.

#### Industry Already Under Pressure

The results have raised broad concerns in the semiconductor business, particularly in California's Silicon Valley, where young women make up the vast majority of the clean-room work force. For two years, the industry has been buffeted by the most severe business downturn in its history and has lost hundreds of millions of dollars.

"The question we don't know is how far the implications go," said Dr. Joseph LaDou, a professor of medicine at the University of California at San Francisco, who has studied health questions about semiconductor workers for several years. "There is a concern about women of child-bearing age who are not pregnant. It's not inconceivable that there could be damage to the reproductive cells of men as well."

Dr. LaDou added that there was still "little understanding" of how some of the rare materials used in semiconductor fabrication areas may affect fetuses.

One executive of a major California chip maker, who asked not to be identified, said that in addition to problems of Japanese competition, many companies might now be subjected to lawsuits and workers' compensation claims. Long before the study results were announced several months ago, some workers had complained of suffering a range of health

# Pregnant Women Banned at A.T.&T. Chip Units

expanded to 740 workers, including a bigger control group, some workers who had left Digital or been transferred elsewhere and the wives of male workers in the production area.

Women in the control group who had been pregnant showed a miscarriage rate of 18 percent, slightly below the 20 percent average for the national population.

The third group worked in another area of the clean room, where strong nitric and sulfuric acids are used to dissolve, or etch, the circuit image on the silicon. The waters are also placed in closed furnaces, where gases like arsine give them unique electrical properties.

Digital's study began in 1983, when five semiconductor manufacturing plants around the country and transferred 15 pregnant women at the plants to other jobs.

At the International Business Machines Corporation, the world's largest semiconductor manufacturer, a company spokesman said it had "notified employees of the Digital study" and reminded them that under company policy they could request a transfer if they were concerned about their health.

"Obviously there are different types of clean rooms and different processes," the spokesman, Richard Coyle, said. "We think our facilities are safe, but we continue to examine the findings to determine their applicability to our facilities."

But women who worked in the photolithographic area showed a miscarriage rate of 29 percent, which Mr. Gibson said was "not statistically significant." In the area where etching and the gas treatment takes place, 39 percent of all women who had been pregnant reported miscarriages.

"That was definitely a significant finding," Mr. Gibson said, although it involved only 12 miscarriages.

The study, which has not yet been published in any scholarly journals, were higher rates of self-reported headaches, nausea and sore throats," Mr. Gibson said. Those findings were not surprising for the clean room, which derives its name from the fact that dust particles are painstakingly filtered from the circulating air.

An initial study, involving more than 300 workers, showed few surprises. "The only significant results were higher rates of self-reported headaches, nausea and sore throats," Mr. Gibson said. Those findings were not surprising for the clean room, which derives its name from the fact that dust particles are painstakingly filtered from the circulating air.

Last year, however, the study was

Dr. Pastides was on vacation yesterday and could not be reached for comment, and calls to Dr. Calabrese's office were not returned.

The investigators divided the workers at the Hudson plant into three groups. One was a control group of

Researcher Called In

She said the company had informed the 8,000 workers in the company's five semiconductor manufacturing plants around the country and transferred 15 pregnant women at the plants to other jobs.

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# Business Day

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