

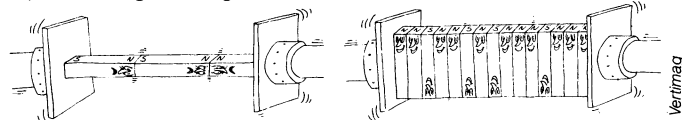
TECHNOLOGY

Recording a magnetic squeeze

A new technology promises to squeeze more information onto magnetic disks, drums and tapes for computer memories. In conventional "longitudinal" recording, the digital 1s and 0s of a computer's binary language are laid down like tiny magnets all in a row, end-to-end, along a recording track. The new technique is "perpendicular" recording, in which the magnetized areas are created at right angles to the surface, extending down into the magnetic medium. While longitudinal recording can pack about 10,000 bits into each inch of track, perpendicular recording can crowd more than 10 times as many into the same space.

In magnetic recording, the magnetic particles on a surface all are initially oriented in one direction. As the surface moves past a recording head (an electromagnet), the head causes the magnetization of particles to reverse if the head's field is strong enough, depending on the incoming, information-carrying signal. In longitudinal recording, increasing the density of bits means shorter magnets, which are more susceptible to self-demagnetization. On the other hand, perpendicular recording creates thinner magnets relative to their length as density increases, and takes advantage of the fact that good magnets should be long and thin.

Conventional recording technology squeezes magnets lengthwise Perpendicular recording squeezes magnets' thickness



IBM attempted perpendicular recording more than 20 years ago, then discontinued its program. In the mid-1970s, Japanese scientists revived the technology, and now all the major Japanese computer companies are working on products. While more than a dozen Japanese universities are researching this area, only the University of Minnesota is pursuing this field in the United States. However, several U.S. companies are now looking at vertical recording for high-density data storage.

One reason perpendicular recording took so long to materialize was the difficulty of finding a suitable magnetic material and refining the sophisticated techniques needed to deposit a film on disk surfaces, for example. The best choice today is a chromium-cobalt alloy, which grows in columnlike crystals. Robert I. Potter of Lanx Corp. says controversy still exists about whether overwriting old information will be a problem, and if conventional recording heads will saturate the magnetic medium. The first U.S. company to come out with a commercial product may be Vertimag Systems Corp. of Minneapolis. It has plans for producing "floppy" disk memories, widely used with personal and small business computers, by late 1983. Later, digital recording of music and video information may take advantage of perpendicular recording's greater capacity.

Computer donations aid NSF program

In response to a National Science Foundation invitation (SN: 4/17/82, p. 263), five computer companies agreed to donate about \$850,000 worth of equipment and materials for use in research projects for improving science and engineering education. The companies were Radio Shack, Atari, Inc., Digital Equipment Corp., IBM and the Apple Education Foundation. William D. Gattis, Radio Shack's education division director, initiated the idea last fall when he offered to donate a number of microcomputers to the NSF.

With the arrival of the closing date for proposals for use of the equipment, the NSF staff is now preparing to sift through the applications in order to select which projects will be funded.

BIOMEDICINE

Coffee and cancer study ignored

Most people paid no attention to recent allegations that drinking coffee might increase the risk of pancreatic cancer. At least that's what researchers at the University of New Mexico reported in the July 8 *NEW ENGLAND JOURNAL OF MEDICINE*. Jonathan M. Samet and associates found that 70 percent of the people they polled were coffee drinkers and that almost 60 percent knew about the study linking coffee to pancreatic cancer. Despite this, only one person polled had reduced coffee consumption because of the study's results.

The pancreatic cancer study was conducted by Brian MacMahon at the Harvard School of Public Health and reported in the *NEW ENGLAND JOURNAL OF MEDICINE* last spring. It showed that coffee drinkers might be doubling or tripling their risk of developing pancreatic cancer — a disease with a particularly bad prognosis (SN: 3/21/81, p. 181).

At the time of the study, the Harvard group said more research needed to be done before any conclusive results could be reached. Critics of the pancreatic cancer study said the results might have been biased because researchers who questioned people about their coffee consumption knew in advance which people had cancer. Despite the criticism, the National Cancer Institute indicated at the time that even *preliminary* results linking the popular beverage with cancer were disturbing.

Pancreatic cancer, the fourth leading cause of cancer death in the United States, is twice as common in males, and treatment results are dismal. The disease progresses rapidly, with death occurring soon after diagnosis.

Samet concluded that despite widespread publicity the results of the pancreatic cancer study were largely ignored and had little impact on America's coffee drinking habits.

Birth control plugs

A novel method of birth control — rubber plugs that block fallopian tubes — may give women a reversible method of birth control if FDA approval is granted early next year.

The method works by blocking fallopian tubes with silicone rubber plugs. Conception can't occur because the egg can't pass through the fallopian tube where it is normally fertilized. According to John B. Schorsch, president of RSP Laboratories Inc., the company submitting data to the FDA, doctors using the method look at the fallopian tube with an optical instrument and inject liquid silicone into the tube's opening. A catalyst in the silicone hardens the liquid quickly to form rubbery plugs that fill two-thirds of the tube.

One major advantage of the procedure is its apparent reversibility. According to Schorsch, doctors can remove the plugs readily. This would be a big improvement over sterilization procedures because women who change their minds about having children can do so with this method. However, because of complicated FDA approval processes, the Stamford, Conn., firm will not submit the method as one that can be reversed, according to Schorsch.

Of the 950 women wearing the plugs there have been no reported pregnancies, but Schorsch said that three women in this group developed cramps and the plugs had to be removed.

Schorsch would not speculate on the possible long-term effects of silicone plugs in the body. He did say that anatomical differences such as small fallopian tubes would prevent an estimated 15 percent of the female population from using the method.

FDA officials said they would not comment on the method's safety until all the data are in. Schorsch said he expects final test results to be submitted to the FDA by January of next year and is optimistic about approval.