

BIOMEDICINE

Obesity starts in the womb

Some scientists believe that the amount of food people eat the first year of life determines their weight later in life. Others believe that the amount of nutrition people receive in the womb is the critical factor. Which hypothesis is correct? Both, according to a study in the Aug. 12 *NEW ENGLAND JOURNAL OF MEDICINE*.

Gian-Paolo Ravelli of Columbia University School of Public Health and his team studied 300,000 Dutchmen who had been exposed to the Dutch famine of 1944-45 at different periods of prenatal and postnatal life. Those men who had received little nutrition during the last three months of pregnancy and the first months of life tended to be underweight, showing that nutritional intake during these months is critical, and that undernutrition at this time tends to counter obesity. Those men who had received little nutrition during the first half of pregnancy, however, tended to be overweight, showing that this period of life is critical to later weight too, and that undernutrition at this time tends to favor rather than counter obesity. The reason? Apparently undernutrition during the first few months after conception interferes with the development of the hypothalamus, the appetite control center of the brain.

Switching off oxygen to zap cancer

The normal amount of oxygen in healthy cells doubles or triples the effects of gamma rays, X-rays and other ionizing radiation compared with the effects seen after irradiation in poor oxygen conditions. In contrast, cancer cells do not contain as much oxygen, so radiation treatment is more likely to hurt healthy cells than cancerous ones.

K. E. Arfors and his colleagues at the universities of Uppsala and Linköping, Sweden, are trying to get around this problem by switching off oxygen to healthy tissues while nearby cancerous ones are being treated with radiation. They have partially reached their aim, they report in the August 5 *NATURE*, at least in experimental animals. They have managed to switch off the oxygen supply to intestinal tissue by injecting degradable starch microspheres into an intestinal artery. Oxygen deprivation lasts five minutes, then ends as the microspheres are degraded.

The researchers will now move on to the next challenge—switching off oxygen while applying radiation.

Thermography and breast cancer

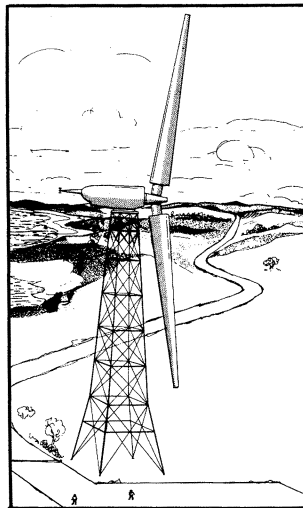
In view of the current controversy over the safety of mammography in screening younger women for breast cancer (*SN*: 8/7/76, p. 90), a number of doctors have hoped that thermography might prove to be an effective and safe substitute. In mammography, potent ionizing radiation—X-rays—are passed through breast tissue in order to detect a cancer. Thermography senses infrared heat differences given off by breast tissue that might reveal the presence of a cancer.

Alas, thermography isn't the answer, at least for now, Myron Moskowitz of the University of Cincinnati College of Medicine and his team report in the July 9 *NEW ENGLAND JOURNAL OF MEDICINE*. Their study revealed that expert thermographers were not able to detect patients with early cancer.

Use of thermography as a single screening tool for breast cancer is not warranted at this time, the researchers conclude. In fact, they even have reservations about its being used in conjunction with physical exams and mammography. However, they have hopes that it may eventually become an effective screening tool. If there are indeed measurable temperature differences between patients with breast cancer and those without, computerized evaluation is not only feasible but mandatory.

TECHNOLOGY

World's largest windmill



The Energy Research and Development Administration and the National Aeronautics and Space Administration have announced plans to build the world's largest windmill to test the feasibility of wind energy in meeting the nation's fuel shortage. When completed in 1978, the 1.5-megawatt electrical generation device will consist of two slender fiberglass blades, spanning 200 feet, mounted on a 150-foot tower.

General Electric will be the chief contractor on the \$7 million project, with the rotor blades and hub being made by Hamilton Standard Division of United Technology Corp. The research for ERDA on wind energy at the Lewis Research Center in Cleveland has been directed by NASA.

The windmill is designed to operate with the blades rotating at 30 to 40 revolutions per minute in winds from 11 to 22 miles per hour. If winds average 18 mph, the generator could supply enough electricity to fill the needs of some 500 homes. This power level is about 15 times greater than that produced by the largest existing U.S. windmill, but it must still be considered an experimental unit.

On-board computers for cars

Electronic control of fuel injection and ignition timing, now available on some cars, promises to be just the first step toward widespread monitoring and control of automobiles by on-board computers. Latest developments are summarized in the August *AUTOMOTIVE ENGINEERING*.

Electronics are expected to average 10 percent of a new car's cost by 1980 and the automotive electronics market is expected to quintuple by 1985. Drivers will receive feedback information, in digital form, about many of the operating functions of the auto and will be protected by antiskid controls and headway monitoring. Such electronic systems will probably be integrated into one central computer, which may even be programmed not to operate if the driver seems to be drunk or impaired.

The United States appears to be leading the trend. General Motors is experimenting with a computer that generates or monitors 34 separate vehicle functions. The Japanese and Europeans are also actively working on computerized cars. Japan, which has some of the worst traffic and strongest government involvement, is considering an Automotive Comprehensive Traffic Surveillance System, with information exchange between on-board computers and a central traffic control unit.

Desalination by membrane

The North Sea island of Helgoland will be the site for West Germany's first large-scale saltwater desalination plant operating on the low-energy principle of osmosis. Krupp Atlas of Bremen will build the experimental plant, which is scheduled to produce 25 tons of drinking water per day. The point of the experiment will be to select a proper membrane for commercial desalination systems, combining the features of rapid flow rate and slow deterioration rate. The Germans hope to tap a growing market for such plants throughout the world.