

medical sciences notes

CANCER

Malignancy linked to chromosome imbalance

A theory that has been debated since Dr. Theodor Boveri, a German embryologist, advanced it in 1902 has been proved correct by two scientists at the University of California's Lawrence Radiation Laboratory in Livermore. The Boveri theory was that a chromosome imbalance leads to cancer.

The scientists emphatically deny, however, that their discovery of an excess of the chromosome called E-16 in malignancies indicates that cancers can be inherited. Although chromosomes are the mechanism of inheritance, it is possible that cancer itself has produced the excess of the E-16 chromosome.

They say it is too early to predict how this new knowledge can be put to practical use, but it opens the way to some intriguing experiments. One is the attempt to induce malignancy in normal human cells by the addition of excess E-16 chromosomes. Another is to track down the specific enzymes the body produces with the aid of the E-16 chromosomes. With this information there might be a possibility of regulating cancer cell reproduction through biochemistry.

Dr. John W. Gofman, associate director of the laboratory and professor of medical physics at the university, worked with biologist Jason L. Minkler on the chromosome study.

Dr. Gofman and Minkler began the chromosome study 18 months ago as a part of an AEC-sponsored project aimed at finding whether low doses of atomic radiation cause cancer.

A report of their chromosome discovery appears in the May 27 issue of *CHEMICAL AND ENGINEERING NEWS*.

DIAGNOSIS

Internal isotope detector

An improved device for detecting stomach cancer, requiring an operating voltage of only 20 volts, has been placed on the market in Japan by the Toshiba company. Conventional detectors use 500 volts, with danger of shock. The catheter-like device has a silicon detector affixed to a gastro-fiberscope.

The detector is inserted into the stomach 20 hours after a patient has been injected with phosphorus 32. The fiberoscope enables the diagnostician to keep the detector in the area of the tumor in spite of the size and internal movement of the stomach.

Phosphorus 32 tends to accumulate around malignant tumors to a greater degree than around normal tissue; the degree of radioactivity of the lesion shows whether or not it is cancerous.

Experimental work was carried out at Tokyo University with Toshiba's Central Research Laboratory.

LUNG DISEASE

Degrees of disability

Chronic lung disease patients, including those with emphysema, can be treated, and in many cases those who have retired as disabled can return to work, Dr. Harold M. Silver reports in the May issue of the *National Tuberculosis and Respiratory Disease Association BULLETIN*.

Dr. Silver, director of the pulmonary research laboratory at the George Washington University School of Medicine, Washington, D.C., reports a study with a machine that measures "maximum voluntary ventilation," comparing a group of 100 private chest-disease patients with 100 applicants for Social Security disability.

"We classified the patients according to the number of steps they said they could walk without becoming short of breath," Dr. Silver says. "It soon became clear that for each level of exercise tolerance the breathing tests averaged the same for the private patients, of whom 84 percent were working, and for the disability patients, all of whom by definition were unemployed."

Admitting that extreme lung impairment prevents a man from working, the doctor says there is a large gray zone in which energy, motivation and treatment can enable patients to work. He deplores the fact that many physicians tell people with emphysema that nothing can be done except to return in a year for another X-ray to find out how much worse it has become. Treatment includes medication to loosen hard phlegm and giving up smoking.

PARKINSON'S DISEASE

Tremors reduced by drug

Response of 26 patients with shaking palsy, or Parkinson's disease, to oral doses of the drug, L-dopa, has ranged from modest to dramatic, Dr. George C. Cotzias and his co-workers at the Brookhaven National Laboratory Medical Research Center at Upton, N.Y., report.

An account in the May 30 issue of *MEDICAL TRIBUNE* says the therapeutic effect of the drug is presumably related to an increase of the compound dopamine, which is believed deficient in parkinsonian patients.

Dr. Cotzias says there is a possibility that L-dopa would have a beneficial effect in patients with tremors or rigidity from other causes than parkinsonism. The first trials in other diseases are being undertaken in Chile on former miners crippled by chronic manganese poisoning. Thus far the drug has markedly diminished muscular rigidity in two such cases.

RESEARCH CENTER

Nerves of squid to be studied

The plentiful supply of squid in Brisbane, Australia, is a factor in the establishment of a brain and nerve research center at the University of Queensland.

Squid have a main nerve that is 1,000 times thicker than in other creatures, and this makes it convenient for study. Investigating how the nervous system works and how the brain remembers will be Dr. Ludvik Bass, a University of Queensland mathematics professor, and Prof. Walter J. Moore, a physical chemist of Indiana University. Prof. Bass invented a mathematical model to help explain the electrical-chemical processes that make nerves work. When a sensory impulse strikes the wall of a nerve cell, there is a drop in the high electrical field inside and outside the wall, resulting in a drop in activity. This allows an electric current to flow so that a nerve impulse travels along the nerve.