

Physical Sciences Notes

CRYOGENICS

Superconducting Logic Element

A new type of superconducting logic element that switches much faster than a cryotron has been developed by Juri Matisoo of International Business Machines Corporation, Yorktown, N.Y.

The device switches, or transfers, current from one path to another, in less than 800 picoseconds, one picosecond being one-trillionth of a second. Switching is probably much faster than this, the limit of Matisoo's measurements.

Interest in superconducting logic circuits decreased when it was found that processes inherent in switching a cryotron between the normal and superconducting states limited its switching speed to 20- or 30-billionths of a second. The new device avoids this limitation since it remains superconducting at all times, Matisoo reports in the current Proceedings of the Institute of Electrical and Electronic Engineers.

The switching device consists of two metal films separated by an oxide layer 10 to 30 Angstroms thick. Above the metal films and insulated from them is a

control film through which a current can be passed to generate a magnetic field that controls the flow of paired electrons through the ultra-thin insulating barrier.

ASTRONOMY

Earth-Based Observations of Mars

Observations of variations in the surface level of Mars can be made from earth when conditions are favorable, Dr. D. H. Harris of the University of Arizona's Steward Observatory has found.

The ground-based observations of Martian relief are possible only when the two planets are relatively close to each other in a specific configuration and when observing conditions are near perfect.

Previous observations made under such conditions give some evidence that relief can be detected, Dr. Harris reports in the March 3 Science. The best times for observing Martian relief during the 1967 opposition were during February and will reoccur between June 1 and Aug. 15.

Medical Sciences Notes

RADIOTHERAPY

Radiation Alone in Breast Cancer

Results with surgery in advanced cases of breast cancer are so poor that surgeons, as well as radiologists, are advising radiation alone—especially the use of cobalt 60. Dr. Eleanor D. Montague of the M. D. Anderson Hospital and Tumor Institute, Houston, Tex., told a Boston meeting she would not go so far as to prescribe radiation alone for all stages of breast cancer, but Dr. Oliver Cope of the Harvard Medical School does. He has abandoned all surgery except biopsy, the examination of tissue.

RADIODIAGNOSIS

Strontium Diagnoses Bone Cancer

A new diagnosis of bone cancer, using strontium 85, is reported by the American Cancer Society, which supported the research.

Dr. David M. Sklaroff of Philadelphia's Albert Einstein Medical Center first tested calcium 47, but because it is difficult to obtain and too energetic, he decided to administer tiny trace doses of strontium 85 intravenously.

Two or three days after injecting the strontium, Dr. Sklaroff went over each patient with a radiosensitive instrument that recorded the radiation emitted from each body area. He found that the strontium isotope concentrated in bone cancers and marked their presence clearly on the scan, thus proving strontium to be a first-rate substitute for radio calcium. The method is even better than X-ray in some instances.

PHARMACOLOGY

New Drug Relieves Muscle Pain

The first drug directed specifically against muscle pain has been put on the market on prescription. It is called a myanalgesic agent by Upjohn Co. officials, who point out that it is derived from the Greek "myos," meaning muscle, and "analgos," meaning absence of pain. The trade name is Maolate. Chemically it is chlorphenesin carbamate.

More than 50 studies, involving 3,000 patients, have been conducted since clinical trials began in 1961. Bursitis, rheumatoid arthritis, osteoarthritis, muscular spasm and back strain are among the conditions relieved by the drug, which is not intended for overall treatment but only to relieve the associated pain.

PREVENTIVE DENTISTRY

Phosphate in Cereals Reduces Decay

Phosphate-treated cereals given to Bloomington, Ind., children are credited with reducing dental decay. Scientists of Indiana University's School of Dentistry divided 500 children into two groups, one receiving cereals with small amounts of sodium dihydrogen phosphate added, the other receiving no phosphate. Both groups ate cereal that had been presweetened.

Twenty to 40 percent fewer tooth cavities appeared in the group eating phosphated breakfast food. The phosphate acts systemically rather than in direct contact with the teeth. Reporting the study in the March issue of the Journal of the American Dental Association were Profs. George K. Stookey and Joseph C. Muhler, with Dr. Roger A. Carroll.