

Dr. Libby and his associates at UCLA are working on a portable radiocarbon dater which will allow specialists to work in the field with archaeologists and geologists.

This will make it possible to excavate and utilize sites which now are little more than dark spots in some remote area, even though the dates obtained on the sites would not be as accurate as those which

would be obtained in the laboratory.

The main advantage of the portable dater for archaeologists would be its use as a guide for digging. But its successful development, as Dr. Libby has pointed out, will permit "radiocarbon daters to go out and share, at least vicariously, in the great thrill of an archaeological dig."

• Science News Letter, 80:122 August 19, 1961

PHYSIOLOGY

Body's Master "Timer"

► THE HYPOTHALAMUS, a part of the forebrain containing vital nervous centers, functions as "the master timing signal generator" of the human body.

Dr. John Erskine Malcolm of the Postgraduate Medical School, London, reports nerve cells in the hypothalamus receive a pulse beat that starts in a circuit connecting arteries in the neck and brain, and is independent of the pulse from the heart. The pulse from this arterial circuit, called the circle of Willis, excites the hypothalamus cells and causes them to generate electrical impulses which are used by the brain as timing signals.

The hypothalamus, Dr. Malcolm contends, is therefore the timing device or "co-ordinating mechanism" that prevents interference between the pulse waves produced by the heart and those produced by the Willis circle.

He compares the action of the hypothalamus to that of a master timing signal generator used with radar equipment to enable the transmitter to take synchronized signals from both the generator and the receiver.

Signals or impulses travel from the hypothalamus to the heart by way of the involuntary nervous system. It now appears, Dr. Malcolm says, that the signals from the heart to the hypothalamus are actually heart sounds, conducted by the bones of the chest and spinal column.

The Willis circle is probably "the most important site in the body" at which these self-starting electrical vibrations occur, he states. A dilated portion of the internal neck artery apparently monitors blood pressure to assure "stable operating conditions" for the pulse-producing arterial circuit, Dr. Malcolm reports in *Nature*, 191:606, 1961.

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MATHEMATICS

Unified System Urged

► MATHEMATICS should be taught as a unified whole. Its "dead, useless, outmoded or unimportant parts" should be abandoned and replaced by a system that merges specific subjects to allow a smooth, gradual transition from basic principles to advanced work.

Drastic revisions in present teaching methods are needed to close the gap between secondary schools, which are 50 years behind the times, and universities, which have kept up with modern research and new programs in mathematics.

The conclusions were reached by mathematicians and educators from 18 nations that attended an international seminar. Their report has been issued by the Organization for European Economic Cooperation, Paris, sponsors of the 1959 meeting at Royaumont, France. It was written by Dr. Howard F. Fehr, head of the mathematics teaching department at Columbia University Teachers College in New York.

The new program would blend geometry and algebra as related subjects, taught from a fundamentally algebraic approach. The differences between the two would gradually disappear.

This would mean changing or replacing Euclid's traditional principles of geometry, taught for centuries. The theory is that all the Euclidean essentials can be learned "intuitively," at ages 11 to 13, by drawing,

measuring, making models and investigating all useful facts.

From 13 to 15, the pupil would study deductive geometry — but not with the time-honored Euclidean triangles. Synthetic geometry would be replaced by a basic mathematics system using vectors, or real numbers. From the age of 15 on, geometry's established principles would be merged with algebra to promote a "gradual departure from physical reality to formal geometric abstraction and structure" by the time the student is ready for college.

Algebra itself would have much of its presently taught material weeded out. The solving of unnecessarily complicated problems is one of the factors that tends to clutter up the subject, the report said.

Trigonometry would not be taught as a separate subject, but as a part of the geometry-algebra mixture and later as a part of analysis.

Two new fields would be introduced at the high school level. They are elementary probability and statistical inference, which contribute to the "scientific method" basic to many modern fields.

New textbooks would, of course, be needed. Most of the countries also reported a need for more and better qualified teachers. Some are considering putting retired mathematics teachers back into service, or hiring retired scientists and engineers with

teaching qualifications.

The countries represented were Austria, Belgium, Canada, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Sweden, Switzerland, Turkey, the United Kingdom and Yugoslavia, all organization members, and the United States, which sent four "guest experts."

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PHARMACOLOGY

Anti-Cancer Chemical Gets Clinical Trials

► A NEW CHEMICAL COMPOUND that slows up three types of mouse tumor is undergoing preliminary trials on humans, four scientists of Lederle Laboratories, Pearl River, N. Y., report.

Three kinds of cancer respond to oral doses of the drug, which is also effective by injection. The types are sarcoma 180, a common type of cancer, 6C3HED lymphosarcoma, a lymph gland tumor, and C3H mammary adenocarcinoma, a cancer attacking the breast glands.

The drug significantly prolonged the survival time of mice that had had transplants of mammary adenocarcinoma, but it was ineffective against "spontaneous" mammary adenocarcinomas.

Previously reported anti-tumor chemicals or "alkylating agents" act as bone marrow depressants, and the new Lederle chemical also diminishes the activity of bone marrow.

The chemical name of the experimental drug now being tried out clinically is N-(acrylamidomethyl)-3-bromopropionamide. Detailed results of evaluation studies of this and other anti-tumor chemicals will be published soon.

Drs. A. S. Tomcufcik, S. D. Willson, A. W. Vogel and A. Sloboda of Lederle Laboratories report in *Nature*, 191:611, 1961.

• Science News Letter, 80:123 August 19, 1961

GEOPHYSICS

Scientists Search for Nuclear Test Sites

► UNITED STATES Geological Survey scientists have been scouring the countryside searching for possible test sites for nuclear explosions. These sites would be used for peaceful or military testing purposes if and when nuclear testing is resumed.

Selection of the proper testing area is very important, Geological Survey scientist V. E. McElvey said. Contamination of surface or underground waters from a nuclear explosion is but one of the many possible hazards, he said.

Two of the sites already recommended to the Atomic Energy Commission are near the towns of Hattiesburg, Miss., and Carlsbad, N.M. Both locations contain thick underground salt layers that would be used to confine a nuclear explosion.

The Carlsbad site was chosen to explore the peaceful uses of the atom.

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