

calculations with electronic "brains" were conceived by Arthur Holt of the Bureau. Most of the work in electronic computers was originally supported by the armed services. They are particularly interested in higher speed machines, since computers are used for control of and defense against guided missiles.

Although present computers calculate with apparent lightning speed, there are many important problems for which they are still too slow. These include not only scientific problems such as found in nuclear physics but also those arising in business, in industry and even in handling the nation's growing traffic problems.

They are too slow despite the fact that SEAC (Standards Eastern Automatic Computer), for instance, can remember more than 1,000 numbers and has ready access to many thousands more by means of magnetic tape or wire, and can add more than 4,000 numbers per second and multiply or divide 400 per second.

Visitors at the Bureau's recent Open House also learned that scientists there have been developing brightness standards for color television. Color TV tubes contain red, green and blue fluorescent materials that, in combination, produce all the required colors in the image. For good pictures, the colors must measure up to certain standards.

The Bureau's radiation facilities include the betatron, synchrotron and gamma-ray laboratories, all of which make it possible for the Bureau to provide the standards, measurements and instruments required in the nation's expanding atomic energy program and in the field of multi-million volt X-rays.

Millions of everyday transactions depend upon the wide variety of standards provided by the Bureau. These range all the way from the wavelength of light measured in millionths of an inch to massive railroad track scale weights. Included are standard screw threads, standard isotopes, gage blocks used for mass production in industry, standard fuels for anti-knock ratings and chemical standards for process control in the steel industry.

In 1901, when the Bureau was established by Act of Congress, it had custody of two primary standards, the meter bar for length and the kilogram cylinder for mass, or weight.

With the phenomenal growth of science and technology over the past century, the Bureau has become a major research institution concerned not only with everyday weights and measures but also with hundreds of other scientific and engineering standards necessary to the industrial progress of the United States.

Science News Letter, June 11, 1955

MEDICINE

Frozen Sleep Surgery

► PATIENTS HAVING operations for removal of cancers may do better under frozen sleep than with other types of anesthesia. Some cancers that cannot be removed under ordinary anesthetics might be removed if the patient were in the frozen sleep stage.

Studies to explore the possibilities are under way at the University of Colorado School of Medicine in Denver. A report from the American Cancer Society which supports the studies states that preliminary observations already show many cancer patients will do better with the frozen sleep than with other types of anesthesia.

Hypothermia is the technical name for the frozen sleep state. The patient is cooled down to a temperature of about 75 degrees Fahrenheit, a little higher than the usual comfortable room temperature, and much below the 98.6 degrees which is normal temperature for the human body.

In the studies by Drs. Henry Swan, Robert W. Virtue and J. Cuthbert Owens the patient is prepared by first giving him enough anesthetic to keep him from feeling the cold. Then he is put into a tub of ice water and ice cubes to reduce his temperature.

At the low temperatures circulation is stopped and the heart can be isolated for operation for as long as nine minutes. The method has been used in many places for operations on the heart, because it lets the

surgeon work on a temporarily bloodless heart. The studies are planned to show whether the method would permit operations to remove tumors that have grown into arteries and other vital organs. It would at least give surgeons a bloodless field to work in.

Science News Letter, June 11, 1955

MEDICINE

Tent Built in Lung To Cover Healthy Part

► A NEW kind of tent is giving help to patients who have to have a part of a lung removed because of tuberculosis or other lung disease. The tent is made from the lining of the chest wall and covers the healthy lung part left after the operation.

Good results with the tent in 89 patients ranging in age from 16 to 74 years were announced by Drs. Laurence Miscall and Robert W. Duffy of Triboro Hospital, New York, at the meeting of the National Tuberculosis Association in Milwaukee.

Empty space above the tent in the chest is filled with air to prevent its filling with fluid and to hold the tent in place. Complications and deformity which may accompany an operation for removal of part of the ribs and permanent collapse of the lung are not risked with the tent technique.

Science News Letter, June 11, 1955

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