

SURGERY

Cut Bleeding Deaths

Eight-point guide to discovery of prevention methods takes into account conditions associated with intestinal bleeding and relation to ulcer production.

► AN EIGHT-POINT guide to discovery of ways to cut deaths due to bleeding from stomach and intestinal tract was reported by Dr. Karl A. Meyer of Northwestern University Medical School, Chicago, at the meeting in New York of the U. S. and Canadian Chapters of the International College of Surgeons.

The eight-point guide consists of eight kinds of disease or damage found more often in patients with bleeding from the stomach and intestinal tract than would be expected. These are: coronary sclerosis in which the heart's arteries are hardened; heart disease with high blood pressure; damage to the big artery called the aorta resulting from syphilis; rheumatic heart disease; hardening of the kidneys and their arteries; liver damage; pancreas damage; and goiter.

Dr. Meyer and his associates feel that the possible relationship of these conditions with the known mechanisms of ulcer production point the way to studies which should help cut the present over-all ulcer hemorrhage mortality of 10% to "a safer level."

A study of about 1,200 ulcer patients

treated at the Cook County Hospital over a three-year period showed that hemorrhages were experienced by about one-third, he reported. Hemorrhages accounted for 36 of the 66 deaths in this series. Of 205 definitive stomach operations performed, massive bleeding was the chief reason in 105 cases.

Dr. Meyer reported that autopsies of patients dying of massive gastrointestinal hemorrhage showed that gastric and duodenal ulcers accounted for about one-half of the cases. Esophageal varices (enlarged veins in the esophagus), resulting from cirrhosis of the liver, were responsible for about 30% of fatal cases of bleeding. Various lesions accounted for the others.

"It was further learned that a fatal outcome of gastrointestinal hemorrhage was not limited to any decade of life, though there appears to be a trend wherein the vast majority of cases occurred between the fourth and the eighth decades," Dr. Meyer said. "A four-to-one preponderance of bleeding in the male sex and the white race suggested a possible endocrine aspect to this problem.

"Because of the striking frequency with

which bleeding occurred between the fourth and eighth decades, almost irrespective of the etiological factor, the investigation of the associated pathology in these patients was undertaken in the hope that some clue might be unearthed that might answer the problem of what causes the fatal outcome."

Science News Letter, September 26, 1953

MEDICINE

Scale Rates Jobs By Energy Cost

► A SCALE for rating jobs for patients who have had heart attacks has been devised by Drs. Joseph G. Benton and Howard A. Rusk of New York University College of Medicine.

The scale rates jobs in terms of energy cost. This is determined by measuring how much oxygen per unit of body weight is consumed in the course of each job or activity in comparison to the amount consumed while at rest.

The energy cost of making a bench out of pine board, which entailed such tasks as sawing, filing, sanding, boring holes with a hand drill and using a screw driver ranged from 1.2 to 2.5 times the resting rate. This energy cost was the same for heart patients and for normal, healthy persons.

Very few working situations, apart from heavy labor, take a sustained energy output of more than two to four times the resting rate. Work only becomes strenuous when its energy cost increases to eight, the doctors reports.

Moderate work has an energy cost of three.

In most jobs, persons in normal health rarely call on their full energy potential. Thus there remains a substantial margin which acts as a safe reserve for most heart patients in most jobs.

Except for extremely heavy labor, almost all the physical activities required in performing a job appear to be within the capacity of most people with heart disease, the tests with heart patients at the New York University-Bellevue Medical Center in New York showed. The results of these tests are reported in *Circulation* (Sept.), the monthly scientific journal of the American Heart Association.

Science News Letter, September 26, 1953

PHYSICS

"Cosmic Stopwatch" Splits Seconds Fine

► A "COSMIC STOPWATCH" splits time into billionths of seconds.

Under the direction of Dr. Harold Ticho, a group of physicists at the University of California at Los Angeles designed the instrument for cosmic ray studies under an Army Ordnance grant.

The device will be used to measure the



LARGEST HELICOPTER—This giant, believed to be the world's largest helicopter, will carry 40 passengers and a normal crew of three in the service of the U. S. Air Force. It is powered by two rotors mounted one behind the other, the blades of which are 82 feet in diameter.

lifetimes of heavy mesons, particles from atomic nuclei. Such particles are thought to exist for only billionths of a second. (One-billionth of a second is to a second as one second is to a hundred years).

The works of the outsized watch include Geiger tubes, scintillation counters, vacuum tubes and certain germanium elements. It works like this:

Fast moving cosmic rays from outer space, which bombard the earth constantly, create these mesons when they collide with atoms of matter in the device. These mesons pass through a fluorescent fluid in the instrument, then cease to exist. Their

passage through the fluid causes a brief and feeble flash of light which is picked up by a photomultiplier tube causing it to flash briefly. The time interval between the two flashes is recorded and represents the mesons' brief life span.

Geiger tubes, which detect arrival of cosmic rays, alert the timing mechanism when to start ticking off its billionths of a second. The face of the stopwatch is actually the face of an oscilloscope and is characterized by a series of waves. Wave crests correspond to the numbers on a clock and are two-billionths of a second apart.

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radio is housed in a transparent plastic case two inches long, one and one-eighth inches wide and three-fourths of an inch thick. It is shown on the front cover of this week's SCIENCE NEWS LETTER. The complex wiring of standard radios is replaced by printed circuits etched in its chassis.

Signal Corps officials credit the transistor with making the tiny radio possible. Transistors are pea-sized chunks of a rare metal, germanium. They can do some of the radio amplifying jobs done by much larger vacuum tubes such as are in television and radio sets. They require little power.

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METEOROLOGY

Weather Now Computed

Much more accurate forecasts in future promise of new techniques of making models of world's weather in "dishpan" or figuring it out on electronic "brain."

► MODELS OF the world's weather, made either in whirling bowls or computed mathematically by giant electronic "brains," promise much more accurate weather forecasts within the next few years.

Better understanding of the causes and effects of our weather using these two types of models were foreseen by top weather experts from the United States, England, Canada and other countries attending the international Toronto Meteorological Conference.

The big question still baffling weathermen is whether our weather starts at the top of the atmosphere and works down, or begins near the earth's surface, with effects observed later at high altitudes.

By swirling colored water in dishpans and bowls, the large-scale patterns of atmospheric flow are easily seen. These patterns can be changed by varying the rate of heating, by introducing obstacles to represent mountains and other geographic features, and by using both cold and heat sources. Thus meteorologists such as Dr. Dave Fultz of the University of Chicago and Dr. Robert R. Long of Johns Hopkins University are duplicating on a small scale some of the vast changes known to be occurring in the world's weather as the seasons change, or as air masses flow past mountain ranges.

Dr. Sverre Pettersen of the University of Chicago pointed out, for instance, that about 1,000 gigantic storm centers are generated every year, and about one-half of these occur in "well-defined patterns near mountain ranges."

Yet at least two severe storms have been forecast with an electronic computer using information from weather maps drawn 12 hours before the storm began. This was done by Dr. Jule Charney of the Institute for Advanced Study. Weather changes have also been followed using mathematically

simplified models of the atmosphere by Drs. R. C. Sutcliffe and J. S. Sawyer of the Meteorological Office, Dunstable, Beds., England, and Dr. E. T. Eady of the Imperial College of Science and Technology, London.

In such models, the effect of heat or geography is not directly taken into account, yet many top experts, such as Dr. J. Bjerknes of the University of California, believe that the heating effects can not be ignored.

Within a few years, however, experiments now being conducted with dishpan and mathematical models of atmospheric circulation are expected by meteorologists to give answers to these problems, and thus better weather forecasts.

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RADIO

Signal Corps Wrist Radio Picks Up N. Y. Stations

See Front Cover

► A WRIST radio has been developed at the Signal Corps Engineering Laboratories at Fort Monmouth, N. J., that uses three transistors instead of ordinary vacuum tubes and picks up New York City radio broadcasts 40 miles away.

Powered by a mercury battery a little larger than the tip of a pencil, the radio has a short antenna worn up the user's sleeve comic-strip style. Sound is carried to the soldier's ear through wires that connect to a hearing-aid earpiece.

Although the tiny radio does not transmit, it can receive programs on a tuning range of 1,000 to 1,500 kilocycles. This is about half of the standard broadcast band.

Built to explore the possibilities of shrinking bulky Signal Corps equipment, the

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