

## NATURAL RESOURCES

**Could Irrigate 200 Million Acres of World's Arid Soil**

► SOME 200 million additional acres of the world's arid soils could be irrigated economically and made to produce food for the increasing population of the globe, Dr. Charles E. Kellogg, chief of the U. S. Department of Agriculture's soil survey division, told the International Symposium on Desert Research in Jerusalem.

Soils to be irrigated would need to be selected and managed with the best skills available, he emphasized, in order to prevent failures and loss of investments in the irrigation works.

About 275 million acres of soil in the world are now irrigated, and a little less than half of this, about 103 million acres, is arid soil. Nearly 30% of the earth's land area, or a bit under 8¼ billion acres is classed as desert or arid soils.

Soil scientists have not had adequate opportunities to study arid soils remote from the present population centers, Dr. Kellogg said. Even when water is scarce, knowledge of the formation and development of arid soils will aid in their use for grazing without irrigation.

Permeability of soil in relation to drainage and salt removal needs to be understood in order to work out methods of modifying structure and water-holding capacity through green-maturing crops, organic soil conditioners and in other ways.

Teams of experts will be needed, in Dr. Kellogg's opinion, to transform successfully wild land into new farms. The task is very different from gradual improvement of farms that are already "going concerns" in humid regions.

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## STATISTICS

**Columbia River Floods Predicted by New Method**

► FLOODS OF the Columbia river can be predicted at least a year in advance, Louis H. Bean of the U. S. Department of Agriculture told the American Geophysical Union meeting in Washington.

For 1952, the amount of water discharged by this great river will be about 700,000 cubic feet per second, Mr. Bean forecast. This is below the usual flood level for the Columbia.

He made this and three other water volume predictions three years ago, on the basis of records available through 1948. His forecasts for the years 1949, 1950 and 1951 were quite close to the actual record taken of the Columbia river's outpouring near The Dalles, Ore.

Mr. Bean's prediction of the discharge for 1952, 700,000 cubic feet per second, is quite close to that estimated by another method described to the meeting by M. W.

Nelson of the Soil Conservation Service, Boise, Idaho, H. G. Wilm of the U. S. Forest Service, and R. A. Work of the Soil Conservation Service in Medford, Ore.

On the basis of up-to-date figures for recent rainfalls plus those for the rainfalls of last fall and for the winter's snows, they estimate that the river's discharge volume will reach 675,000 cubic feet per second.

The three scientists use only records taken since the previous fall in making their estimate. Mr. Bean bases his predictions on an analytical study of the records of the river for as many years as possible. The same technique, he said, could be applied not only to the Missouri river, foretelling the floods there this year, but can also be applied to crops, weather famines and a wide variety of other natural phenomena.

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## METEOROLOGY

**Whirling Dishpan Shows World Weather**

► THE WEATHER of half the world can now be created in a rotating dishpan and studied indoors.

Dr. Dave Fultz, 30-year-old assistant professor of meteorology at the University of Chicago, described his laboratory weather at a meeting of the American Meteorological Society in Washington. He won the society's Meisinger Award for his work with the rotating dishpans.

Water, with tracer chemicals such as dyes or aluminum powder, is put into the dishpan to create a reasonable facsimile of the general circulation patterns over the northern hemisphere of the world. The dishpan is then heated in specific places and set rotating.

The rotation is similar to the revolving of the earth. To observe the movements of water in relation to this going around, Dr. Fultz "stops" his simulated hemisphere with an optical instrument which goes around in the opposite direction.

He can then see how the heat he has applied, like the heat of the sun on the real thing, sets up fast and slow "wind" currents which undulate over the face of the earth. He has even put "mountains" made of small blocks of wood in the bottom of his dishpans and observed the formation of anticyclones and resulting turbulence in the "wind" currents.

Formerly, meteorologists had to set up their theories of how the weather works from the obviously inadequate observations they could make of all weather conditions over an entire half of the real globe. Now, according to Dr. Fultz, the general circulation patterns which bring us today's and tomorrow's weather can be observed in a 15-inch dishpan. He says that some striking disagreements with classical theories about the weather already are evident.

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**IN SCIEN**

## PSYCHIATRY

**Adrenal Removal Improves Condition of Mental Patients**

► AN OPERATION which has been used to help far advanced cancer patients is now being tried as a means of restoring mental patients to sanity.

The operation consists in removal of the adrenal glands. It improved both physical and mental health of two patients with both cancer and mental disease, and brought temporary improvement in the mental condition of two more mental patients who did not have cancer.

The operation, tried because of a relation between adrenal glands, brain metabolism and mental functioning, was reported to the American Psychiatric Association meeting in Atlantic City by Drs. Nathaniel S. Apter, W. C. Halstead, D. M. Bergenstal and C. M. Huggins of the University of Chicago, Drs. H. Hoagland and Gregory Pincus of Worcester Foundation of Massachusetts, and Dr. A. P. Bay of Manteno, Ill., State Hospital.

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## TECHNOLOGY

**Ultrasonics Not Practical To Kill Sewage Bacteria**

► ULTRASONICS DO not seem to offer the sanitation engineer an economical way to kill bacteria in sewage at present, three members of the civil and sanitary engineering department of the Massachusetts Institute of Technology, Cambridge, Mass., have concluded.

In a joint report by John P. Horton, Murray P. Horwood and Donald E. Phinney to the Federation of Sewage and Industrial Wastes Associations, the men said that although ultrasonics can be used to kill bacteria, they have at least three limitations:

1. They are absorbed quickly by waste liquids unless the liquids are exposed to them in shallow depths.
2. The presence of solid particles in waste liquids reduces the lethal effect of ultrasonic vibrations.

3. The bacteria-killing rate of ultrasonics drops off rapidly with a decrease in surface tension caused by the presence of organic compounds in the sewage.

Based on current cost estimates and figuring electric power at two cents per kilowatt-hour, the men concluded that it would cost about \$15,000 to sterilize 1,000,000 gallons of water, even if the liquid already was near 140 degrees Fahrenheit, a temperature that yields a high bacteria-killing rate.

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# CE FIELDS

## MEDICINE

### Blood Cells Wasted Could Yield Protein To Save Lives

► ENOUGH PROTEIN to keep 100,000 persons nourished for 10 days could be salvaged from the red blood cells thrown out each year in the production of blood plasma, Dr. Charles S. Davidson of Harvard Medical School and the National Institute of Arthritis and Metabolic Diseases declared at a symposium on blood and plasma extenders held at the dedication of the new Sharp and Dohme Medical Research Laboratories, West Point, Pa.

The protein would be in the form of modified human globin, prepared from human red blood cells by a method first devised by Dr. Max Strumia of Bryn Mawr Hospital, Bryn Mawr, Pa.

It can be fed or injected into veins or under the skin. It has been given to patients with various kinds of cancer, the kidney disease nephrosis, and simple under-nutrition. About 60 patients suffering from shock and burns have also been given this human blood medicine with satisfactory results.

Doctors using it reported they thought the patients got the same benefit they would have from plasma.

The relatively new blood material seems to have a future as a plasma extender. It compares favorably with other extenders, such as dextran and PVP, and has some advantages over them.

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## BIOCHEMISTRY

### Tick-Made Blood Chemical Seen Giving Cancer Clue

► A CHEMICAL called sanguinin, extracted from human and animal blood and believed to be an antibiotic produced when ticks attack, is giving "a hot new clue to the body's changed chemistry in cancer," in the words of the American Cancer Society.

Sanguinin lowers production by the liver of a vital enzyme, catalase, Dr. J. K. Cline, director of the cancer research department of the Medical College of Alabama in Birmingham, has found.

Catalase production by the liver is also lowered, in people and animals, when there is a rapidly growing cancer anywhere in the body. The function of catalase is to break up hydrogen peroxide into water and oxygen, thus preventing the body from being poisoned by too much of this chemical which it normally produces. Consequently many cancer researchers have

thought the principal poisonous effects of cancer were due to its lowering catalase production and allowing increased amounts of hydrogen peroxide to accumulate in the body.

Ticks and mosquitoes are believed to make sanguinin to prevent infection at the place they bite or suck blood, so that the blood will stay fluid for their nourishment.

Dr. Cline tested sanguinin made by Dr. Ludwik Anigstein of the University of Texas. This sanguinin was made by having trypsin digest red blood cells. From its effect in lowering liver catalase production and from other observations, Dr. Cline believes cancers and insects both make sanguinin.

He is trying now to break up the sanguinin molecule, to see which fraction of it blocks catalase. From this may come a method for measuring the amount of active sanguinin fraction in the blood and thus, perhaps, a blood test for cancer.

Compounds to block sanguinin and so allow catalase production to continue might also be discovered. These might prove useful as chemical treatment for cancer.

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## METEOROLOGY

### Winds Against Himalayas Make North Pole Move

► MONSOONS PUSHING against the high Himalayas and air masses moving over the Asiatic continent keep the North Pole moving in a flat circle of 20 feet in diameter.

So stated Drs. Walter Munk and Gordon Groves of the Scripps Institution of Oceanography, La Jolla, Calif., at the American Meteorological Society meeting in Washington.

Monsoons, the strongest steady winds in the world, push steadily from north to south against the Himalayan barrier in the winter, and from south to north in the summer, Dr. Munk said.

This, together with the gain in air mass over Asia, has sufficient force to tilt the axis of the earth. However, instead of moving directly south in winter and north in summer, it moves in an ellipse, 16 feet wide one way and 20 feet wide the other way. The South Pole does the same thing.

Astronomers have known for about 60 years, when their observational techniques became good enough, about this movement of the earth's pole, but it was attributed to ocean currents and tides. Dr. Munk declared that ocean currents account for only one percent of the pole's "excursion."

Dr. Munk told SCIENCE SERVICE after he read his scientific paper that the broad general west-to-east winds hitting both the Rockies and the Andes are one of the important factors in the extremely small variations, never more than one-thousandth of a second, in the length of a day.

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## METEOROLOGY

### Hurricanes and Typhoons Spotted by Seismographs

► LIVES OF Navy and Air Force pilots now on hurricane and typhoon patrols and thousands of dollars in operational expenses may be saved if a new, inexpensive, shore-based method works out.

All that will have to be done to track the storms over the Atlantic and Pacific is to watch seismographs—the instruments which record earthquakes.

However, according to Dr. Florence W. van Straten, meteorologist with the U. S. Navy, a lot more scientific work must be done. She described a study of eight Pacific typhoons which might be a step forward in proving the method.

Until Dr. van Straten's study, there was disagreement as to whether hurricanes and typhoons directly caused the seismographs to respond or whether the waves from the storms, hitting the beaches, made the wiggles on the instruments. People trying to track hurricanes with seismographs got very poor results. Other people said this was because they actually were tracing the force of the waves on the beaches.

Dr. van Straten told a meeting of the American Meteorological Society in Washington that both things happened. Her eight typhoons were tracked from Guam where there was little chance for beach effects unless the storm came close. When the waves did not increase at Guam, she still got a response from the seismograph. Furthermore, this response pointed to the typhoon with mistakes of only 25 degrees. Where there were high waves in conjunction with a typhoon, her mistakes in direction were as high as 50 degrees.

Now the problem is to try to separate the two responses on the seismograph. This will be relatively easy in the Pacific, quite hard in the Caribbean and Atlantic, she said.

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## GENERAL SCIENCE

### Elect Three Trustees Of Science Service

► ELECTION OF three new trustees of SCIENCE SERVICE, the institution for the popularization of science operating as a press association specializing in science, has been announced:

Dr. Duane Roller, professor of physics at Wabash College, Crawfordsville, Ind., nominated by the National Research Council; Charles E. Scripps, chairman of the Edward W. Scripps Trust, Cincinnati; and Dr. Homer W. Smith, head of the physiological laboratories of the New York University College of Medicine, nominated by the National Academy of Sciences. At the annual meeting of the Board of Trustees, last year's officers were reelected.

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