

PHYSICS

Five Globe-Trotting Instruments Leave Again

FIVE of Prof. Robert A. Millikan's globe-trotting electroscopes are going to the far ends of the earth to gather new cosmic ray secrets.

Dr. H. Victor Neher, colleague of Prof. Millikan in the recent cosmic ray studies at California Institute of Technology, is on his way to Rapid City, S. D., to install three of the instruments in the forthcoming National Geographic-Army Air Corps stratosphere flight of Captain A. W. Stevens and Major W. E. Kepner.

Two similar, self-recording instruments have been put aboard the S. S. Monterey, which has departed for the Antipodes. They will be cared for by the captain of the steamer.

The California cosmic ray instruments are encased in heavy shielding material to cut out all extraneous radiation from the highly penetrating cosmic rays. The record of cosmic ray intensity is recorded automatically on motion picture film inside the apparatus.

Already Dr. Millikan and Dr. Neher have obtained several hundred feet of cosmic ray film from balloon, airplane, stratosphere flights, trips through Canada, the United States, Central and South America, the Galapagos Islands, the Orient and a round-the-world-cruise.

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PHYSIOLOGY

Body's Ability to Store Oxygen May Help Fliers

AVIATORS preparing for high altitude flights may in future spend an hour or more in breathing pure oxygen before taking off. Experiments with rats at the University of Southern California show that by such means the animal body can store up oxygen against a time of need, such as mountain climbers and altitude fliers encounter.

Experiments substantiating this fact were reported by Prof. Francis Marsh Baldwin and Harold B. Robertson of the University's physiological laboratories at the meeting of the American Association for the Advancement of Science.

White rats, which have physiological responses very similar to man, were made to breathe pure oxygen for twenty-five, forty, seventy, and one hundred

and thirty minutes and were subjected to atmospheric conditions comparable to those found at altitudes of from six and one-half to eight miles.

Evidently the animals were able to store up some of the oxygen in their bodies, for these animals stand the high altitude atmospheric conditions longer than control animals that had not had pure oxygen to breathe first.

Seventy minutes of oxygen breathing gave the greatest resistance to subsequent oxygen-want in high altitude conditions. Twenty-five minutes was of considerable value. Forty minutes of oxygen breathing was of less value than either twenty-five or seventy, which the scientists explained as being probably due to a shift in body processes similar to the adjustment a runner makes when he gets his "second wind." Exposure to oxygen for longer than seventy minutes decreased the animals' ability to withstand the low barometric pressures.

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SEISMOLOGY

Will Make "Earthquakes" To Get Data on Real Ones

NORTHERN Wyoming is due for a series of earthquakes during the next thirty days, but no alarm need be felt. They are to be artificial earthquakes.

California Institute of Technology scientists, led by Dr. John P. Buwalda, geologist, and Dr. Beno Gutenberg, geophysicist, will create artificial shakes in the Big Horn Basin to study wave phenomena similar to those in real quakes.

The artificial quakes are produced by exploding dynamite in holes four or five inches in diameter and between twenty and fifty feet deep. The charge is exploded at the bottom of the hole, with the rest of the hole filled with water to concentrate the explosion.

Four super-sensitive seismographs, set up at varying distances from the center of the disturbance, are connected with a recording instrument in a special truck where the wave phenomena recorded by each instrument is recorded on the same tape.

Tests are being conducted in various parts of the country to study the wave effects upon rocks in different hardnesses. Three years ago similar experiments were undertaken in Yosemite Valley.

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IN SCIENCE

CHEMISTRY

New Kind of Gas Attack Protects Fruit From Decay

IF ORANGES are subjected to a new kind of protective gas attack, storage damage from decay is reduced to half or quarter of the usual losses.

The gas used by Dr. L. J. Klotz of the University of California's Citrus Experiment Station at Riverside, Calif., is nitrogen trichloride. It promises to combat decay-causing fungi upon citrus fruits in storage rooms or in loaded cars of packed fruits.

Very small concentrations of this gas do the work satisfactorily. Equivalent concentrations of chlorine gas, while more toxic to the fungi, injure the fruit rind and open the door to greater losses later.

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PUBLIC HEALTH

Baby Death Rate Can Be Reduced by Mother's Milk

MOTHER'S milk is the means to further reduction of the death rate among American babies, Drs. Clifford Grulee, Hayworth N. Sanford and Paul H. Herron of Chicago told members of the American Medical Association. They based this opinion on a study of 20,000 Chicago babies.

The mortality for these infants was ten times higher among those artificially fed than among those fed by their mothers in the natural manner, the baby specialists found.

The success of artificial feeding of infants during the past few years has made it seem that the prepared baby's foods can safely replace mother's milk, but there is no scientific proof of this, Dr. Grulee and associates declared.

Natural feeding by the mother gave greater resistance to infection than artificial feeding, the records of the 20,000 babies showed. Even partial breast feeding gave considerable protection against disease which the completely artificially fed babies did not enjoy.

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CE FIELDS

AGRICULTURE

Irrigation Water Carries Plant Food With Drink

FOOD as well as drink for plants now flows in some of the irrigation ditches watering southern California farms. Instead of spreading nitrogen-containing fertilizer on soil, a little ammonia gas is allowed to mix with the irrigation water. Dr. Dean D. Waynick of Anaheim, Calif., has used this method in extensive trials and finds that plants thrive even better on their liquid nitrogen-containing diet than on solid fertilizer.

Dr. Waynick's experiments were reported to the meeting of the American Association for the Advancement of Science.

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ECONOMICS

Stanford Teacher Offers Chemical Theory of Money

THE TANGLE of money and prices that now confronts the world can best be explained by applying the principles of chemistry and psychology to economics, Prof. T. J. Kreps of Stanford University School of Business Administration told the economics section of the American Association for the Advancement of Science.

Offering a psycho-chemical theory of money, Prof. Kreps contended that the peculiar combination of variables in the interplay between money, credit and prices are somewhat like the interchanges of water in the forms of steam, liquid and ice.

Violent movements of prices and money are similar to a bubbling, steaming cauldron, while normal economic conditions are like still pools of clear water of slowly changing level. The chemical economic world is seasoned with the feelings, fears and aspirations of the people in it and this introduces a psychological factor.

Three other kinds of economic universes have been created in the minds of economists, Prof. Kreps said.

First, there is the universe of pure

magic, in which prices are supposed to rise when legislative bodies decree they shall. Second, there is the widely accepted brand of price money theory that Prof. Kreps calls Newtonian. In this all the factors supposedly add up. Inflating money so much is supposed to increase prices so much. Third, there is the coin-tossing kind of economics, an economic cosmos of pure chance where no one thing controls.

Prof. Kreps feels that his psycho-chemical interpretation fits the facts best of all.

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MEDICINE

Surgeon Tells How to Patch a Broken Heart

PATCHING and mending broken hearts is a job for surgeons and one to which they should give more attention, Dr. Claude S. Beck of Cleveland, told members of the American Medical Association.

Dr. Beck was not referring to the heart wounds made by Cupid's darts but to the tears, bruises and breaks which occur as the result of injury to the heart by other sharp instruments and bullets. Many of these can be repaired with the surgeon's needle, and Dr. Beck thinks that in the future new surgical methods will be developed for repairing heart injuries and correcting heart deformities, just as operations have been devised for injuries and deformities of other parts of the body.

The heart can take an enormous amount of injury and still recover, Dr. Beck and associate, Dr. Ernest F. Bright, found in a series of experiments to determine the effect of bruises on the heart.

Collisions, falls or heavy blows may injure the heart as well as bullets and knives, Dr. Beck pointed out. Injuries from the former causes have been rather overlooked, either because they produced no disturbance or because the symptoms they did cause were attributed to disease.

Dr. Beck reported the case of a man whose heart had been flattened by being kicked in the chest by a colt when he was a lad of four. He had been an invalid ever since, but Dr. Beck said that the condition, in his opinion, could have been corrected by surgical treatment shortly after the accident.

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PSYCHOLOGY

Mannose, Odd Sugar, is Both Sweet and Bitter

FOR EXTRA dessert at the biologists' banquet, a feature of the meeting of the American Association for the Advancement of Science, there was a strange sort of sugar, mannose, chemical relative of ordinary sugar.

The queer thing about it was that some of the banqueters could not taste it at all, some called it sweet, others pronounced it bitter, and still others thought it both bitter and sweet.

Dr. Albert F. Blakeslee, geneticist of the Carnegie Institution of Washington, could not resist an opportunity to use the feasting fellow-scientists as guinea pigs for his experiments on taste and smell. So he distributed little pellets containing measured amounts of mannose, whose differing taste effects had been called to his attention by Dr. C. S. Hudson, government authority on sugars.

Even the flowers used as table decorations were part of Dr. Blakeslee's experiment. Snapdragons were sniffed as an example of a weak smell, while golden gleam nasturtiums provided the sample of a strong smell which to most people is unpleasant.

The most striking substance which people taste quite differently is a white chemical, phenylthiocarbamide, violently bitter to some and quite tasteless to others. Dr. Blakeslee finds that ability to taste this chemical is inherited somewhat like eye color.

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BOTANY

Green Leaf Pigment Influences Plant Yield

THE AMOUNT of the green leaf pigment, chlorophyll, in part determines the yield of a plant, according to Drs. J. C. Ireland and Parks A. Yeats, plant physiologists of the Oklahoma Agricultural Experiment Station. Their experiments were performed on sorghum plants.

Although the amount of chlorophyll decreases as the grain hardens, it increases in kafir, a grain sorghum, until the time of seed maturity.

Different varieties of grain sorghum, they say, show characteristic differences, but these differences are constant throughout the life of a given variety.

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