PHYSICS

Ping Pong Balls Aid in Recording Cosmic Rays

SENDING instruments eighteen miles up into the stratosphere, scientists of the California Institute of Technology, headed by Dr. Victor Neher, have just launched the newest study of cosmic rays direction and intensity at Oklahoma City.

Strings of small hydrogen-filled balloons bore aloft the delicate apparatus which will automatically register cosmic ray intensity. The equipment rises until one or two of the small balloons burst and then the rest bring it slowly and safely to the ground, to be returned by farmers for a small reward.

Tiny ping-pong balls play an important role in the equipment, said Dr. Neher, being used to reflect light into a small camera which takes robot pictures of the instrument readings while the flight is in progress.

Science News Letter, July 23, 1938

LANGUAGE

Hebrew Speeches at Last Recorded in Shorthand

SPEECHES in Hebrew language can now be taken down in shorthand.

At recent Zionist congresses in Jerusalem, a system of Hebrew stenography devised by J. Maimon proved fast and flexible enough to capture the proceedings. A daily newspaper in Hebrew reported happenings of the congress with all the speed of convention news in America.

Mr. Maimon himself, commenting on usefulness of this recording aid for Zionist life in Palestine, says:

"Hebrew stenography has apparently passed its infant stage. There is no doubt that if it will progress in the future at the same rate as during the past two years, the time will soon come when a knowledge of Hebrew stenography will be required of every typist seeking employment."

It may seem odd that Hebrew has not had speedy recording before. Shorthand is so old.

Cicero's secretary Tiro took down speeches by merely abbreviating well known words and leaving out what his good memory could supply. Orators repeated so shamelessly, Tiro often made one bored sign stand for a sentence.

The idea, of course, has gone through many stages to reach the glib efficiency of the modern stenographer's pen. Today, an international system has been adapted to 24 languages—Hebrew being the latest.

Hebrew presents peculiar difficulties. Mr. Maimon explains that when he came to Jerusalem in 1922 he found existing Hebrew shorthand systems impractical. Familiar with German shorthand, he tried fitting its outlines to Hebrew sounds and in 1924 took down a speech lasting an hour and a half. He continued to take down hundreds of lectures. Adapting the international system gave better results, and when students demanded lessons, in 1929, he produced a textbook. By 1931, the first stenographer, besides himself, was able to do fast recording.

Science News Letter, July 23, 1938

PHYSICS

Tunnels Are Scene of Latest Cosmic Ray Study

CHICAGO'S unique freight tunnel system underneath the Loop and the downtown district is the newest scene of cosmic ray research.

Prof. Arthur H. Compton, Nobel prize winning physicist of the University of Chicago, has just announced experiments conducted in a tunnel 50 feet beneath Chicago streets which showed cosmic rays penetrating to that level are heavy electrons known as barytons.

The apparatus was set up in a tunnel within a few blocks of the downtown Loop. Experiments were conducted by Volney C. Wilson under Prof. Compton's direction. These experiments are to show that electrically neutral rays known as neutrinos play no important part in cosmic ray effects in regions from sea level down through fifty feet or more of rock, Prof. Compton said.

"The rays prominent at these levels are probably barytons or heavy electrons. There is little evidence, if any, to make us doubt this. It is of especial interest to note that the rays which are thus identified as the most important part of the cosmic rays which we found about us consist of a kind of matter which was unknown on the earth previous to the cosmic ray study," he declared.

Prof. Compton explained that recent investigations indicated the presence in cosmic rays at sea level of a type of particle having the charge of an electron but a hundred or two hundred times as much mass. These particles are called barytons. Last summer in a copper mine in northern Michigan Mr. Wilson ascertained that cosmic rays could penetrate 1,600 feet of rock.

Science News Letter, July 23, 1938

IN SCIENC

PUBLIC HEALTH

Malnutrition Plague Called Major World Wide Problem

"WHEN do we eat enough and properly?"

That is one of the world's major questions today. There is no major famine plaguing mankind today, but the specter of hidden hunger is abroad in the world.

Millions of people in all countries are suffering from malnutrition. That means, not getting enough of the right kind of food to eat. It means little children who are unnecessarily sick, boys and girls with bad teeth, people who lack energy to do more than merely exist.

The magnitude of the problem is emphasized by a report of a committee of the League of Nations that has had the aid of experts from many countries during the past two years.

The surprising thing about this condition is that, as the League committee notes, it can exist in a world in which agricultural resources are so abundant and agriculture is so perfected that supply frequently outstrips effective demand. Quite evidently it is a problem for the statesman and international cooperation rather than merely a concern of the farmer, the food merchant and the housewife.

Improved nutrition means more use of what the dietitians call "protective" foodstuffs, such things as milk and vegetables. Because these are perishable they must be produced near where they are eaten. That means diversified local farming.

But there are larger potential markets for the corn and wheat growers, too, because not every one has enough of these energy-producing foods.

How to fight the hidden hunger plague:

Tell the people about the right kinds of food to eat. Lower the cost of food. Let governments see to it that their populations are fed adequately, even though this means direct grants. The League committee is confident that in the long run such a program with a low relative cost would save incalculable suffering and economic loss.

Science News Letter, July 23, 1938

E FIELDS

PHYSICS

Novel Windmill Sailboat Is Propelled by Rotor

See Front Cover

THE NOVEL "windmill sailboat," designed by Burk Wilford of Philadelphia, which is shown on the front cover of this week's SCIENCE NEWS LETTER, uses a rotor to move it through the water instead of the conventional sail. The rotor is set at an angle to the wind and the blades begin to revolve, pulling the craft through the water. A hand lever controls the angle at which the rotor is set, while a brake enables the "windmill' sailors to stop the boat by stopping the rotor. The boat can go backwards as easily as forward.

Science News Letter, July 23, 1938

BOTANY

Devil's Shoestring May Start New Insecticide Industry

DEVIL'S shoestrings trail along the whole southeastern seaboard of the United States, from New England to Texas. They aren't of any use now, but in time to come a new American industry may start from them. Promise has been counted good enough, at any rate, to justify the spending of considerable research time on the project, by a team of six scientists. The U. S. Department of Agriculture tells what they found in a new technical bulletin.

Devil's shoestring is a plant. It belongs to the pea family, and it is known by such other names as rabbit bean, turkey pea, and goat's rue. Botanists call it *Tephrosia*. It looks rather like a vetch, only bigger.

In the tough, woody roots of devil's shoestring chemists have found the same compound now obtained from the roots of derris and cubé, imported in quantities from the East Indies and tropical America, for use in making sprays to kill flies, mosquitoes, and other insects. This compound is called rotenone. It is harmless to man and other warm-blooded animals, but deadly to insects; hence its popularity as a spray ingredient.

This discovery of rotenone in the roots of devil's shoestring does not mean that an all-American insecticide industry can be built up overnight. A great deal of pioneering research must still be carried out, paid for either by the government or by private enterprise. Probably the government may do it.

Participants in the research reported in the new bulletin where A. F. Sievers, G. A. Russell, M. S. Lowman, E. D. Fowler, and C. O. Erlanson, all of the U. S. Department of Agriculture, and V. A. Little, professor of entomology at the Texas Agricultural and Mechanical College.

Science News Letter, July 23, 1938

AERONAUTICS

Single Indicator For Blind Landing Systems

A SINGLE indicator instrument for blind landing systems has been patented by Francis W. Dunmore, National Bureau of Standards scientist who has played a prominent part in research aimed at the development of a safe blind landing system for airplanes.

Two movable needles, at right angles to each other when the plane is on course and in varying positions when the plane is off course, feature the device which serves as a single indicator in place of the several previously required. It is covered by patent No. 2,119,530, assigned to the United States government and in that way made available to the aviation industry without royalty requirements.

The needles are controlled by radio signals sent out in such a manner that they define a proper path for the plane in approaching the airport. One beam, for example, indicates the proper direction. If the plane is on course, the vertical needle is in the center; if the plane is to the right of its proper path, the vertical needle swings to the right.

Mr. Dunmore's indicator is used in one blind landing system, the so-called Air Track system, which is due to receive extensive trials within the next year, and has already been installed at the Pittsburgh airport.

The horizontal needle, controlled by radio signals setting the proper altitude or glide path, moves above the proper position when the plane is above the path and returns to a proper position when the plane gets on course again.

The advantage of the device is fact that it substitutes reading one simple instrument for following a number of more complicated devices.

Science News Letter, July 23, 1938

VOLCANOLOGY

Volcanoes' Fiery Breath Sampled by Scientists

OFFICERS of the law upon the highway "sniff" the breaths of traffic troublemakers, to judge if anything inside them may be responsible for their dangerous propensities. Menaces though these citizens may be, such sampling of respiratory products must seem "sissy" to volcanologists. These scientific sons of St. George are satisfied with nothing short of bottlefuls of dragons' breath.

Prof. Stanley S. Ballard of the University of Hawaii, who is also research associate in geophysics in Hawaii National Park, tells in a new publication of methods for getting information about what goes on inside a volcano by capturing and studying the gases that come out of it.

The hottest parts of the volcano's breath, the gases that are actually flaming as they emerge, are of course uncapturable. Nevertheless, that does not mean that they cannot be examined. By turning the slitted telescope of a spectrograph on them as they glow, it is possible to split their light up into its component wavelengths and to get a record of these as lines on a photographic film for later measurement and interpretation.

Preliminary work of this kind has been done, but with instruments too small to give really valuable results. Prof. Ballard hopes to get a piece of scientific artillery of sufficient caliber to make a really telling assault upon the volcano's fiery citadel.

But actual samples of the gases themselves, that issue from fissures on the volcano's flanks and cracks in its crater floor, can be taken in suitable glass vessels, carried off to the laboratory, and put through the ordinary course of chemical analysis.

It is proverbial that "He who sups with the Devil must bring a long spoon." Volcanologists keep their distance by providing their sampling flasks with very long necks, and sometimes mounting them on poles as well. They poke the end of such a long-necked flask into the fuming volcanic vent. The flask has previously had its air pumped out; so when the seal is broken the gases rush into the vacuum. Then a stopcock is turned and they are trapped.

Science News Letter, July 23, 1938

Canada produces 22 metals important in world markets.