SCIENCE NEWS

Science Service, Washington, D. C.

ROCKET EXPERIMENTS

FROM a small depression in a remote corner of Camp Devens, near Worcester, Massachusetts, rockets will sail upwards from a steel tower to heights that can not be predicted with certainty. Perhaps their greatest altitude for some time to come will be measured in only thousands, or even hundreds, of feet, but from them scientists are looking forward to the time when they will be able to explore heights above the earth far greater than any reached by airplanes or balloons.

The Camp Devens experiment is part of the work of Dr. Robert H. Goddard, professor of physics at Clark University. Dr. Goddard is one of the pioneer students of this form of locomotion. It was in 1912, while at Princeton University, that he began his researches. In 1914 he went to Clark, where he has worked ever since. Much of his work has been done with the assistance of the Smithsonian Institution and later of the Carnegie Institution of Washington. In 1919 the Smithsonian Institution published his first report on his work in which he outlined his theories and experiments.

Referring to this report, Dr. C. G. Abbot, secretary of the Smithsonian Institution, said recently: "Professor Goddard's basic inventions of 1914, whereby he applied the correct angle gas orifice; his later successful introduction of continuously burning liquid propellants, and his mathematical theory, published by the institution in 1919, form the foundation on which important events in the exploration of the air will probably depend."

So important have been Dr. Goddard's researches, and so much do they promise, that now a grant has been made to him by Mr. Daniel Guggenheim in order that he may continue them with adequate facilities. An advisory committee has been appointed, consisting of Dr. Abbot; Dr. J. C. Merriam, president of the Carnegie Institution of Washington; Dr. Charles F. Marvin, chief of the U. S. Weather Bureau; Dr. R. A. Millikan, of the California Institute of Technology; Dr. Walter S. Adams, director of the Mount Wilson Observatory; Dr. John A. Fleming, acting director of the Carnegie Institution's Department of Terrestrial Magnetism; Colonel Chas. A. Lindbergh and Henry Breckinridge.

The Goddard rocket is essentially the same as the fourth of July pyrotechnic, in that it is propelled by the recoil from the discharge of gases. This is quite different from the way an airplane is propelled, for example, which depends upon an actual push against the atmosphere. As a result, the rocket will work just as well outside the earth's atmosphere as in it; in fact, since the air causes a certain amount of resistance, it would theoretically work better in a vacuum. Professor Goddard has perfected a liquid propellant for his rocket which has many advantages over gunpowder or similar explosives. As this burns up as it is used, the rocket continually becomes lighter. In scientific exploration of the upper atmosphere, above the present altitude records, instruments would be carried up, and a parachute would bring them safely to earth after the charge had been exhausted.

Dr. Goddard does not promise when he will be able to send rockets up to these great altitudes. The only ones he has fired so far are small affairs, which have only ascended a few hundred feet. Similar rockets will be fired from the Camp Devens station, though increasingly higher and higher altitudes should be attained. He compares his present experiments with the first efforts of the Wright brothers, who flew only a few feet, but whose work laid the foundation for the present high development of the airplane.

After the rocket is perfected, it is expected that it will be possible to study the spectrum of the sun without the screening effect of the ozone layer 50 to 75 miles above the earth, which cuts out a large part of the solar radiation. Knowledge will doubtless be gained of the Kennelly-Heaviside layer, the ionized stratum in the atmosphere that makes possible long-distance radio. Samples of the atmosphere from these high altitudes may be brought down for analysis, and it may prove that at these heights what rarefied atmosphere there is consists mainly of hydrogen and helium instead of oxygen and nitrogen.

THE INTERNATIONAL MEETING OF PHARMACISTS IN STOCKHOLM

THE contents of ships' medicine chests and who should be responsible for them is one of the problems being discussed by pharmacists at the meeting of the International Pharmaceutical Federation which opened at Stockholm on July 16. This organization has for members the principal pharmaceutical societies of thirty-two countries in Europe, North and South America, Australia, New Zealand and Africa.

A special committee reported on present practices of various countries with regard to ships' medicine chests. These vary widely from Spain, which has no regulations and no inspection, to Germany, which has very complete regulations and requires at least an annual inspection by a competent person. The United States has apparently no special regulations governing the supply of medicines to ships beyond those governing the ordinary practice of pharmacy. The officers of the U. S. Public Health Service are the persons responsible for seeing that adequate supplies of medicines are carried on board the vessels.

The commission recommended that the supply of medicines and surgical appliances to ships should be made by pharmacists only, and preferably by those able to visit personally the ships they supply. Every ship should carry a list of the supplies of this sort which it is required to carry by the regulations of its country. No ship except those making short voyages should be permitted to clear from port until the master is in possession of a certificate from a doctor or pharmacist that the stocks of medicines and appliances prescribed on the

list are complete. The commission also recommended that the federation publish an international formulary of ships' medicines.

The commercialization of pharmacy was attacked in a report on the influence of the chemical and pharmaceutical industries on the practice of pharmacy made by Dr. J. H. Hofmann, of Holland, and Dr. A. Schamelhout, of Belgium. These investigators found that with the present system in most countries, physicians are more and more prescribing proprietary medicines instead of writing prescriptions of their own for the pharmacist to fill. This has tended to make the pharmacist a merchant, and to deprive him of his professional status. The report recommended governmental regulations of pharmacists and their shops and greater emphasis in medical schools on study of drugs and prescription writing, as remedies for the present situation.

MALNUTRITION IN PORTO RICO

SERIOUS malnutrition in Porto Rico, particularly among children, is reported by Professor H. C. Sherman, specialist in food chemistry at Columbia University. Professor Sherman spent some time this year at the School of Tropical Medicine in San Juan, where he lectured and studied the food problems of the people of the island.

Development of Porto Rico's sugar and tobacco plantations has put much land into the hands of absentee landlords who bought out the small farmers. Thousands of these farming families have thus entered the casual labor group to compete for jobs and to buy food at increasing prices, Dr. Sherman states in *The Journal of Home Economics*.

"The great majority of the people of Porto Rico must live almost entirely upon whatever food will satisfy hunger at the expenditure of the fewest pennies. Usually this is rice and beans.

"It must be emphasized," he continues, "that the food supply is inadequate as well as ill-balanced, for it would be a tragic error to try to reduce their supply of rice and beans in order to balance their diet. They are not getting too much of rice and beans, but they are getting too little of other foods."

Milk is especially needed and this need can best be met now by shipping canned and dried milk from the United States. Dairy cattle-raising is handicapped in the island because of the shortage of pasture land and because parasites prey heavily on cattle. Supplementary feeding for school children and orphans is being introduced in some places to meet the malnutrition.

The situation is a vicious circle of poverty, undernutrition and impaired efficiency which must be broken.

THE CAUSE OF GINGER PARALYSIS

A SUBSTANCE related to carbolic acid is probably the adulterant which caused thousands of cases of paralysis from drinking Jamaica ginger last February and March.

A phenol compound, probably the phosphoric acid ester of tricresol, is the substance which Dr. M. I. Smith, of the U. S. Hygienic Laboratory, working with the Prohibition Bureau, found in samples of the ginger from shipments that had caused cases of the paralysis. Samples from shipments thought but not definitely known to have caused paralysis also contained this substance. Samples from lots that did not cause paralysis did not contain any of the phenol compound.

Samples from the first two classes of shipments were fed to rabbits, monkeys and dogs. The monkeys and dogs were not affected, but the rabbits became paralyzed in the limbs and died of respiratory failure.

An adulterated fluid extract of ginger was made in the laboratory to resemble the ginger that had caused the outbreaks of paralysis in human beings. This extract contained tricresyl phosphate, the suspected compound. It had the same effect on the animals as the samples of the ginger which were known or thought to have caused the human disease.

The government scientists were at a loss to explain why the monkeys and dogs were not affected by the ginger samples, but they found that paralytic symptoms could be produced when the suspected phenol compound was broken down chemically before being given to the dogs and monkeys. This suggested that the compound passed through the stomachs of these animals unchanged, while in the stomachs of rabbits and of man it was broken down into a poisonous substance.

INSECT BEHAVIOR

DR. FRANK E. LUTZ, of the American Museum of Natural History, has added to the stock of perplexing riddles of insect behavior by a series of experiments performed on the larvae of caddis flies. These infant insects have shown an adaptiveness in their behavior that in some instances looks as though it contained an element of deliberate choice.

Caddis flies are somewhat primitive insects, whose larvae live in the water. They make a cocoon-like case in which they live. The case is spun of silky threads, and in most species is reinforced with various foreign objects which the larva picks up and builds into its walls. Some species use bits of twigs and leaf-stems exclusively; others, living in swifter waters, use small pebbles and grains of sand.

Dr. Lutz deprived a number of larvae of their cases and then put them in vessels of water with building-materials to which they were not accustomed. He gave the stem-users only sand and pebbles and the pebble-users only stems and decayed leaves. Inasmuch as the ancestors of these insects had been using only their preferred materials for millions of years, the larvae were thus suddenly confronted with as severe a problem as though one were to transplant a Hottentot to Greenland and expect him to build a snow igloo.

The larvae met their problems and solved them, some responding readily, others more reluctantly. But they all built themselves new houses out of the unaccustomed materials. The stem-building species showed some signs of ancestral habit when they had to work with sand, for they chose the long, cylindrical particles formed from

broken sea-urchin spines. But the sand-builders with nothing but leaves to use worked out an entirely new technique. They bit the leaves into suitably sized pieces and then worked these into the walls of their dwellings.

WILD ASSES AND OSTRICHES IN PALESTINE

THE wild ass and his sons still scamper and bray in the Syrian desert. And wild ostriches still make their nests about the ruins of the once proud Greco-Roman city of Palmyra.

A recent expedition into the Syrian hinterland, sent out by the Hebrew University of Jerusalem, has determined that these animals still exist, and has brought back to headquarters a number of other species new to science. The scientific personnel of the expedition consisted of I. Aharoni, zoologist; M. Zohary, botanist; Miss F. Eckman, parasitologist, and George Halil Tahan, hunter.

It was found that although the wild ass, mentioned in the Bible, has become extinct over a large part of his former range, he may still be found on a long, narrow strip of territory stretching from Mosul toward Persia.

The Syrian ostrich was seen in the vicinity of Palmyra, and three of its eggs were purchased from an Arab. They were smaller than other ostrich eggs, and Mr. Aharoni is of the opinion that the birds may turn out to be a distinct subspecies.

Another prize brought back by the expedition consists of two fine skeletons of the cheetah, or hunting leopard. This animal is domesticated and used like a hunting dog in some parts of Asia, but these particular specimens were hunting "on their own" too near a flock of sheep. They were shot by a French official of the Syrian mandate, M. Paul Clerc, and presented by him to the Hebrew University.

Many smaller animals were observed and collected. Of one rare species, the Syrian squirrel, three living and thirteen dead specimens were brought in. This little animal seems to be a communist, for colonies of five or six of them will store nuts and other food supplies in a common cache in a hollow tree.

Small birds were also investigated by the expedition. One occurrence vividly illustrated the literal accuracy of the verse in the Book of Proverbs: "The eye that mocketh at his father . . . the ravens of the valley shall pluck it out." A wounded magpie had been captured, and was placed near an owl, also injured. The magpie promptly tried to pluck out the owl's eyes. Mr. Aharoni states that this bird always attacks the eyes first.

ITEMS

SPECIAL orders to quarantine officers in Manila and on the west coast of this country have been issued by the U. S. Public Health Service in order to prevent any spread of cholera from the Philippine Islands to this country. Eight hundred cases have been reported unofficially from the Philippines, although the official figures are considerably lower than this. Passengers for the United States are not allowed to board vessels at Manila unless bacteriological tests have shown them to be free of the germs of this disease. If these tests are not made, the passengers must be kept under observation for five days before sailing. Quarantine officers are ordered to be on the watch for cases of the disease in vessels arriving from the Philippines.

STATISTICIANS of the Metropolitan Life Insurance Company have found in a survey of vital statistics that fewer deaths from pernicious anemia have been reported since the treatment with liver or liver extract has become countrywide. This statistical proof bears out the impression of doctors and pathologists throughout the country. Since the introduction of the treatment by Drs. George R. Minot and William P. Murphy, of the Harvard Medical School, the deaths from the disease, and even cases of it, have become comparatively rare in the hospitals. Since 1926, when the liver treatment was first introduced, the mortality for whites has been reduced by about half between the ages of 55 and 74 years, when formerly the heaviest mortality from this disease occurred.

ABOUT 250,000 deaths resulted from influenza epidemics in this country between January, 1920, and the middle of 1929, according to a report issued by the U. S. Public Health Service. These figures are based on the records of 95 cities for six epidemics occurring one each in 1920, 1922, 1923, 1926, the spring of 1928 and the winter of 1928–29. This total is nearly half that of deaths in the United States during the great pandemic of 1918–19. The last epidemic of 1928–29 accounted for about one fifth of the quarter-million deaths, or 50,000, while another 100,000 occurred during the sharp epidemic of the spring of 1920.

A POISONOUS substance known as lyso-lecithin has been found in ordinary polished rice by a Japanese investigator, Dr. Motoe Iwata, working at the biochemical laboratory of the Institute of Physical and Chemical Research at Tokyo. The poisonous substance was only obtained after repeated extraction with alcohol, so that it could hardly have any effect on human beings through ordinary consumption of the cereal. However, it may have some relation to the factor in polished rice which causes the nervous disease, beri-beri. This will be investigated later. Beri-beri has previously been thought to be due to absence of vitamin B in polished rice, when the latter has been the chief food of affected persons.

THAT there appears to be no real danger that locusts will become a serious pest in Mexico at this time is the belief of Dr. Alfons Dampf, in charge of technical investigations in pest control work of the Mexican Ministry of Agriculture. Locusts are swarming in Yucatan, but they always exist in that state. In the fields they are fought with sprays and oil, while the brush in which they sometimes appear is burned. This type of locust hardly ever goes farther north in Mexico than the states of Jalisco and Nayarit.