PHYSICS

Abbé Lemaitre Extends Uncertainty Theory

ABBÉ Georges Lemaitre, the Belgian priest-professor of the University of Louvain, now visiting this country, has extended the uncertainty theory of physicis to the electrical field of a particle.

Prof. W. Heisenberg, the German physicist, by developing his uncertainty principle, which held that it was impossible to know accurately the place and speed of an object at the same instant, introduced a concept of wide philosophical consequences.

Now in a letter to the *Physical Review,* Abbé Lemaitre develops formulae which allow him to conclude that for instantaneous determinations the electromagnetic field of an electron, proton or atomic nucleus is practically undetermined. To know the instantaneous field of such a fundamental particle of matter to within one part in a hundred, Prof. Lemaitre computes that its charge must be at least 60,000,000 times the fundamental charge on the electron which physicists designate as small letter e. This is a relatively large quantity although it is small when translated into volts.

The atom as originally visualized by Prof. Neils Bohr, the Danish physicist, was considered by Prof. Lemaitre in the light of these new computations of the uncertainty principle.

"Bohr was right," Prof. Lemaitre said, "when he considered the field of the atomic nucleus as determining the orbit of the electron, since this field is static and remains significant when averages are taken over long periods of time. He was also right in neglecting the radiation of the moving electron, because we see now from the uncertainty principle that the only determined field is the average field during a time in which the electron has made more than 10,000,000,000 revolutions."

Science News Letter, February 4, 1933

SEISMOLOGY

Ocean Bottom Shaken Near Madagascar

THE BOTTOM of the Indian Ocean southeast of Madagascar was shaken by a severe earthquake late on the afternoon of Saturday, Jan. 21, reports from a number of seismological stations indicate. Scientists of the U. S. Coast and Geodetic Survey located the epicenter at approximately thirty-three degrees south latitude, fifty-nine degrees east longitude. Time of origin of the quake was 2:20.8 p. m., eastern standard time.

The Pacific ocean floor almost directly north of Samoa was disturbed by an earthquake on the night of Friday, Jan. 27. Scientists of the Jesuit Seismological Association, St. Louis, working on data gathered telegraphically by Science Service, made calculations showing that its epicenter was in latitude nine and one-half degrees south, longitude one hundred seventy-three degrees west. Time of origin was 10:36 p. m., eastern standard time.

Science News Letter, February 4, 1933

PUBLIC HEALTH

Medical Guilds Proposed To Balance Costs Care

HOW WOULD you like to pay $50 or $60 every year to a medical guild which would in return take complete care of your health, whether you were sick or well during the year?

This is the possibility seen by sponsors of a new plan for balancing the costs of medical care. The plan, calling for the establishment of medical guilds, is announced by Evans Clark, director of the Twentieth Century Fund, in a book published recently. The Twentieth Century Fund was one of the backers of the Committee on the Costs of Medical Care which recently disbanded.

By the guild plan, as Mr. Evans outlines it, individual members would pay $50 or $60 every year, sick or well. In return they would have the benefit of annual health examinations, dental care, the attention of physicians and nurses, and the use of hospitals and clinical laboratories whenever needed. Membership in the guild at this figure probably would not include care in cases of tuberculosis or mental disease, which require long periods in hospitals.

Sponsors of the plan point out that each guild member would be able to include a fixed sum in his budget for illness, just as he now does for other items; that at the same time each physician of the guild would have a fixed adequate income and would be relieved of the burden of adjusting fees and making collections.

Preventive medicine is favored under the guild plan, Mr. Evans says, because periodic medical examinations, said to prevent illness to a marked degree, would be included.

Science News Letter, February 4, 1933

IN SCIEN

PHYSICS

Lithium Atoms Smashed By Low-Voltage Missiles

LITHIUM atoms have been disintegrated by bombardment with streams of protons or positive electrical particles at relatively low voltage, by three German physicists at the Institute for Experimental Physics at Kiel.

The three researchers, Dr. H. Rausch von Traubenberg, A. Eckardt and R. Gebauer, sought the threshold, or point of lowest electrical energy, at which the atom-breaking phenomenon would take place. When first performed last year by Drs. J. D. Cockcroft and E. T. S. Walton at Cambridge University, the energy used amounted to 600,000 volts. With a specially constructed apparatus the workers at Kiel obtained definitely detectable atomic breakdowns with an input of only 29,000 volts, less than a twentieth of the energy used in the English experiments.

The work of the three German physicists is summarized in a report to *Die Naturwissenschaften.*

Science News Letter, February 4, 1933

MEDICINE

Mystery of Fatal Peruvian Disease Solved

THE MYSTERY that for 40 years has surrounded the highly fatal Peruvian disease known as Oroya fever is finally being penetrated, it appears from a report in the *Journal of the American Medical Association.*

Dr. Ramón E. Ribeyro, professor at the National University of San Marcos of Lima, Peru, has finally shown that the outlook in this disease is good unless it is complicated by infection with an organism known as paratyphoid B bacillus. It is this complication which is responsible for the deaths that occur in cases of Oroya fever.

The mystery of this disease, comments the *Journal,* has taxed the ingenuity of numerous workers since Daniel A. Carrion in 1885 sacrificed his life to prove the identity of verruca peruana and Oroya fever.

Science News Letter, February 4, 1933

CE FIELDS

ENTOMOLOGY

Mosquito Horde Attacks And Kills Livestock

A FURIOUS attack by a mosquito horde near Miami, Fla., resulted in the death of at least 173 head of livestock and poultry, F. C. Bishopp of the U. S. Department of Agriculture has reported to *Science*.

While blood loss was an important factor, Mr. Bishopp is of the opinion that the death may have been due to the injection of a toxin by the mosquitoes as well as to loss of blood. He points out that few of the current reports of fatal attacks on man and animals by mosquitoes have been verified. The check of the losses in this instance was made by T. E. McNeel of the U. S. Bureau of Entomology.

Science News Letter, February 4, 1933

ENGINEERING

1000 Degree Steam Predicted for Power Plants

CONCENTRATED energy, bottled up at a temperature nearly five times that of boiling water and a pressure of 1,400 pounds or more per square inch, was predicted to the American Institute of Electrical Engineers by Melvin D. Engle and Irving E. Moultrop, engineers with the Edison Electric Illuminating Co., Boston.

The bottle will be the steam boiler of the future, made with stronger alloys than are available today and containing so much steam that it will be able to operate efficiently enough to reduce the cost of generating electricity.

"Most of the problems involved in the use of a steam temperature of 750 degrees Fahrenheit have been solved," the engineers explained. "Some of the new stations now being built will operate at temperatures of from 825 to 850 degrees Fahrenheit, and within a comparatively few years plants undoubtedly will be operating with steam temperatures of 1,000 degrees Fahrenheit.

"Since the limitations imposed by the materials used in the construction of superheaters, reheaters, turbines, valves, and other such equipment slowly are being removed and the 1,000 degree Fahrenheit station no longer is a fantastic dream; it will be a reality within the life time of many of those living today."

A pressure of 1,400 pounds per square inch has already been reached in a few installations and several large plants to operate at nearly this pressure are under construction. It was pointed out that the development of apparatus using these unusually high pressures has been very rapid.

Science News Letter, February 4, 1933

GEOLOGY

Meteor Crater Possibly 40,000 to 75,000 Years Old

METEOR CRATER, the great pit in the northern Arizona plateau believed to have been caused by the smashing impact of a massive projectile from the skies, may be much older than it is commonly credited with being. Past estimates have ranged from 2,000 to 10,000 years, but on the basis of five independent lines of geological evidence Prof. Eliot Blackwelder of Stanford University is "led to suspect," he states, "that the crater was made during the last interglacial epoch, perhaps 40,000 to 75,000 years ago."

Most of Prof. Blackwelder's evidence consists of indications of a much moister climate than now prevails on the arid plateau, and of a relatively long duration of this moist climate. Most striking is his interpretation of a deep deposit of lake-bed strata at the bottom of the crater. This deposit is of such a nature that it indicates a long-standing, permanent body of water, not a mere succession of playas or seasonal ponds such as might be found in the Southwest of today. At present one must bore 200 feet below the bottom of the pit to find permanent water.

The old lake-bed deposits consist of extremely finely pulverized quartz with many remains of snail-shells and diatoms, or one-celled water plants. This is interbedded with fresh-water limestone, beds of coaly material, and a single layer of volcanic ash, indicating a long-past explosive eruption somewhere in the neighborhood.

Prof. Blackwelder's other lines of evidence consist of marked indications of active erosion by the wind and also by running water, such as is furnished by the infrequent "cloudbursts" of a semi-arid region.

Science News Letter, February 4, 1933

BOTANY

Hybrids Not Always Bigger Than Parents

HYBRID plants are not always bigger and stronger than their parents in every respect, but the size-increasing effects of crossing are shown in some hereditary characters and not in others. Indications to this effect, contrary to prevailing assumptions about "hybrid vigor," have been found in a study of oat hybrids by F. A. Coffman of the U. S. Department of Agriculture, and are published in a preliminary note in *Science*.

Mr. Coffman bred two different lines of hybrid oats, which is incidentally a difficult plant to hybridize. In one line he found that the first hybrid generation was taller, had more stalks per plant, weighed half again as much and yielded a third again as much grain, than the larger of its two parent plants. But in other respect it did not excel both its parents, as by the assumptions of "hybrid vigor" it should; it was merely intermediate between them. The second cross likewise excelled its parents in some characters, but was intermediate between them in others.

Other hybrid oats, not described in detail, are mentioned as having shown "hybrid vigor" in certain characters.

Science News Letter, February 4, 1933

PHYSICS

Unlike Neutrons May Save Conservation Law

THAT ALL neutrons do not have the same mass or weight is predicted by Dr. A. v. Grosse of the Kent Chemical Laboratory, University of Chicago, in a communication to the *Physical Review*.

Electrons or beta rays given off from a disintegrating atomic heart do not always have the same energies. This has worried physicists so much that some have suggested that the principle of conservation of energy be abandoned in considering the emission or capture of electrons in the atomic nucleus. Dr. Grosse suggests instead that the masses of all neutrons are not identical but vary according to the energies of the beta rays that are actually observed.

The neutron was the atomic building block, similar to the proton or hydrogen atom heart except for its electrical neutrality, which was discovered by Dr. J. Chadwick at Cambridge, England.

Science News Letter, February 4, 1933