SCIENCE NEWS

Science Service, Washington, D. C.

THE LEONID METEOR SWARM

FEARS of astronomers that the expected display of Leonid meteors might again fail to appear, as in 1899, have been justified. Observing from the Flower Observatory of the University of Pennsylvania, of which he is director, Dr. Charles P. Olivier, president of the Meteor Commission of the International Astronomical Union, observed these shooting stars at the rate of thirteen per hour, during the early morning hours of Wednesday, November 16. Correcting for the proximity of the bright moon, this would mean that about thirty might have been seen every hour after midnight had the sky been dark. This is far inferior to the display of last year, which it was hoped might be the forerunner of a brilliant shower this month, possibly rivaling that of 1866.

Though Dr. Olivier is awaiting reports from observers in other parts of the world in the hope that the shower might have reached the earth during daylight hours here, he thinks it unlikely.

It seems probable that the damage done to the meteor swarm by Jupiter before 1899, in pulling aside the center part so much that it missed the earth, though the beginning and end reached us in 1898 and 1901, has not yet been repaired. It had been thought that Jupiter might since have pulled the swarm into line again. Thus it seems likely that 1933 may also be deficient in meteors of the Leonid swarm, but that in 1934 we may have one like last year's. Or we may have a shower like that of 1901, when the meteors fell at the rate of more than a hundred an hour.

But Dr. Olivier again emphasized the uncertainty of predicting the behavior of meteors, since we only see them in their dying moments, and unlike other astronomical bodies can not observe them over a large part of their orbits.

During the Leonid meteor shower on the night of November 15–16 radio pulse measurements were made at the Bell Telephone Laboratories at Deal, New Jersey. In the opinion of J. P. Schafer and W. M. Goodall, who carried out these tests, the results confirm the theory that meteors cause sufficient ionization in the layers of the upper atmosphere to reflect short-wave radio signals. It is a well-known fact that there are two ionized regions which reflect short-wave radio signals. Coincident with the occurrence of visible meteors overhead, the ionic density of the lower layer was often observed to increase. This ionization was usually found to last from twenty seconds to two minutes; at times, much longer. The same investigators had previously made observations during all the more important meteor showers of 1931 and 1932, but unfavorable weather conditions had prevented a direct correlation between the measured increases in ionization and the passage of meteors overhead. This correlation has now been obtained, although at times during the night clouds obscured portions of the sky.

CHEMICAL ATTACK ON CANCER

WITH test-tubes and gases, a government chemist is attacking the cancer problem. At the science forum of the New York Electrical Society on November 16, Professor Carl Voegtlin, of the U. S. National Institute of Health, reported progress along three lines of chemical investigation looking toward a cure of the disease.

He has recently made a fundamental observation which may have a far-reaching influence in the study not only of cancer, but of other diseased conditions. This observation is that in both normal and cancerous tissues in the test-tube, it is an easy matter to break down the cell albumen in an atmosphere of nitrogen. It may be built up again in the presence of enough oxygen, and then broken down again in nitrogen.

Albumen is perhaps the most essential component of cells. It is present in all living matter. It determines to a considerable degree the specific behavior of different cells. Without a building up of the albumen molecules, cells can not multiply indefinitely.

Cancer is considered by most of its students as a disease of certain cells which leads to their unrestricted multiplication and their destructive action on surrounding normal cells, Professor Voegtlin explained. Consequently, his discovery of the rôle of oxygen in the building up of albumen in tissues, and of the fact that cancer tissue uses oxygen faster than normal tissue, is of considerable significance.

The cancer-fighter is constantly seeking a chemical which will check the cancerous growth. Copper compounds added in infinitesimal amounts to tissue cells growing in the test-tube were found to check cell division. These copper compounds were regular cell components. On the other hand, glutathione, a sulfur-containing substance, under certain conditions favored the division of cells.

Of interest in connection with the claims for lead treatment of cancer is the observation made by Professor Voegtlin that of all the metals tried, only lead salts had an injurious effect on the cells. While lead may have some value in treatment, it is too dangerous to the patient to be of general usefulness, he said. Iron, manganese, cobalt and zinc in similar concentrations to that of the copper had no appreciable effect. The action of other chemicals is being studied at present.

"Another important chemical factor which may operate in the growth of cancerous tissue is the relative acidity of the tissues," Professor Voegtlin said. He and his associates studied this problem in living animals affected by cancer. They devised a new method for this research.

"The acidity of cancerous and normal tissue is measured by a fine glass capillary electrode which is carefully inserted into the tissue and connected with a suitable physical measuring equipment. It was found that malignant tissues show an acid reaction even in the early

stages of growth. Normal tissues were found to be slightly alkaline, as is also normal blood.''

While these various lines of attack are still in the laboratory stage, Professor Voegtlin is hopeful that they will lead to a chemical treatment of cancer.

RESEARCH ON TYPHUS

ARISING from his sick-bed, where he has been recuperating from an attack of typhus fever acquired during his investigations of it, Dr. R. E. Dyer, of the U. S. Public Health Service, addressed the New York Electrical Society on November 16.

Dr. Dyer reported the investigations by which he and his colleagues found that the American form of mild typhus fever is carried from wild rats to man by rat fleas. Dr. Dyer pointed out that ''epidemic typhus fever has been a scourge in Europe for many centuries and has been introduced into the eastern part of the United States from time to time in connection with immigration. In 1910 Dr. Nathan E. Brill, of New York, described a disease which was subsequently identified as typhus by the U. S. Public Health Service. This disease is known as endemic typhus or Brill's disease.''

Dr. Dyer also pointed out the differences between epidemic typhus of European countries, which has a death rate of 20 or 22 per cent., and the mild American form, which has a death rate of about one per cent. ''European epidemic typhus has its greatest prevalence in winter; it is associated with crowding; it is most prevalent in the lower strata of society; multiple cases in households, jails and hospitals are common; it is spread from man to man by the body louse. Endemic typhus has its greatest prevalence in summer and fall; it is not associated with crowding; there is no predilection for the lower strata of society; there is no evidence of spread from man to man. Dr. K. F. Maxcy, of the U. S. Public Health Service, made a study of this disease and obtained no evidence suggesting louse transmission.''

Dr. Maxcy's discovery that persons employed in food-handling establishments were exposed to an increased risk of infection to this disease led to the theory that a rodent reservoir existed. Dr. Dyer himself isolated the virus which causes the disease from wild rats and rat fleas obtained at premises where human cases of the disease occurred. Subsequent studies gave proof that the disease attacks persons working in contact with wild rats and that it is transmitted by the rat flea. ''Through this work the U. S. Public Health Service has pinned one more disease on the lowly rat,'' Dr. Dyer concluded.

AN ELECTRICAL MOSQUITO TRAP

A NEW electrical mosquito trap for use in malaria prevention is being investigated by the U. S. Public Health Service, Surgeon-General Hugh S. Cumming told members of the New York Electrical Society at their science forum on November 16. The surgeon-general devoted most of his address to a description of the U. S. National Institute of Health.

Surgeon-General Cumming stated that ''at this institute, which is a branch of the Public Health Service, the federal government maintains a staff of experts whose job it is to delve into the unknown and develop such facts as they can on matters pertaining to the public health.''

Not all phases of these researches are carried out purely as laboratory experiments. In the control of malaria, for example, the institute cooperates with field workers, blood examinations being made at the institute, while the men in the field test the value of new drugs in treating the disease and of new larvicides for controlling the production of the disease-carrying mosquitoes.

''As an adjunct to the latter, a new type of mosquito trap is under investigation which employs scientific discoveries in the electrical field all the way from light to sound,'' said Surgeon-General Cumming. ''A trap is under study where the attractiveness of different colored lights in conjunction with the inflowing draft from a suction fan is being combined with the possible attraction for the flying mosquito to differing musical notes. An apparatus has been constructed, the hum of which closely resembles the hum of a mosquito. We propose to determine which note is the most attractive.

''The instrument consists of a decade system of condensers which vary by 1/10,000 of a micro-farad and one variable condenser capable of varying from 1/1,000 of a micro-farad by imperceptible gradations to practically zero. These will produce notes with a vibration frequency from approximately 128 per second to 7,500. These notes, through the delicacy of the condenser system, can be varied by intervals of 1/40 of a major tone by changing the frequency as little as one cycle per second at the lower end of the scale and 20 cycles per second at the upper.''

ARROWHEADS FOUND WITH NEW MEXICAN FOSSILS

THE discovery of man-made objects associated with fossil animal remains, made by road-builders working near Clovis, New Mexico, has led the Philadelphia Academy of Natural Sciences and the University of Pennsylvania Museum immediately to send to the site Edgar Howard, research associate of the two institutions, to see that full scientific information is obtained before the evidence is destroyed in the course of further road construction.

The importance of this locality was recognized by Mr. Howard in the course of his explorations last summer, when a local investigator, A. W. Anderson, brought to his attention several specimens of an unusual type of arrowpoint, and from fossils found near by of several types of animals long extinct on this continent, among them a tooth of a mammoth, which led to the possible conclusion that man had lived in this area at a very remote period.

The University of Pennsylvania Museum and the Philadelphia Academy of Natural Sciences had been developing plans to study the archeological and paleontological problems of this site near Clovis next spring, but the news of the finds in the course of the construction of the road indicated the need for immediate action.

The site was apparently the bed of an ancient lake, long since dried up. Here the animals came for water, and here, it is supposed, the primitive hunters waited to kill them. A considerable number of the distinctive arrowpoints have been picked up in this area. They show a surprisingly high technical quality. Other points of this same type have been found in the Southwest in recent years, the most striking discovery being at Folsom, New Mexico, where the points were found in close association with an extinct species of bison.

In the summer of 1931, Mr. Howard discovered another characteristic specimen in a cave near Carlsbad, New Mexico. It was found several feet below a stratum of the remains of the Basket Makers, recognized as one of the earliest peoples to inhabit these regions.

Much evidence, therefore, seems to support the supposition that these new arrowpoints were the products of a race of man long antedating the Indians known to have existed on this continent. If it can be determined with what animals these were associated, an approximate date may be established for the coming of man to the Western Hemisphere.

ITEMS

HALF a century ago, and years before even the crudest wireless sets were made, Thomas A. Edison devised a vacuum tube that can be used to-day to pick up broadcasting. But Edison failed to become the father of modern radio. Business in his laboratory was so pressing that he left to others the work of developing radio as it is known to-day from his tube discovery. Proof of the ability of Edison's early tube to detect radio signals was given on November 21, in an anniversary program arranged by the New York Electrical Society and Electrical Testing Laboratories. An exact replica of the old tube detected the sending, from a small transmitter in the studio, of music of the 1880's and in turn delivered this sound to the microphone of the network for rebroadcasting throughout the country.

PLATEOSAURUS, the ancestor of all dinosaurs, is "at home" in the Harvard Museum of Comparative Zoology. An eighteen-foot skeleton, the first mounted specimen of this particular dinosaur to be exhibited in any museum in this country, has been received from Germany, where its scattered bones were found in a deposit in Württemberg. Plateosaurus was apparently a flesh-eater, for the skull is armed with sharp-pointed teeth; yet he was ancestor to the great lumbering herbivorous dinosaurs like Diplodocus as well as to the smaller but more active Tyrannosaur tribe. Like the latter group, Plateosaurus walked on his hindlegs and apparently used his shortened, claw-armed forelegs for holding his prey. His forefeet have five toes, instead of the three of later dinosaurs, but two of the toes already show signs of evolutionary degeneration. The geologic age of Plateosaurus is Upper Ariassic. This dates back some 160 million years.

DR. JOHN B. YOUMANS, of Nashville, reported to the American Society of Tropical Medicine, on November 17, that epidemics of dropsy, or edema, have been occurring regularly at certain seasons in Tennessee. The condition seems to be the result of a diet low in calories and in proteins. This diet is more the result of habit and custom than it is of poverty, Dr. Youmans said. "In itself the edema probably causes little harm," he said, "but the chronic starvation, particularly of protein, that it apparently represents, may cause serious disorders. The principal remedy is to be found in public-health education, in which more attention should be paid to diet."

AMOEBAE, tiny parasites that cause one type of dysentery, have more disease-producing ability when they are taken from active cases of the disease than when they are taken from symptomless carriers. Likewise, these parasites are more potent for producing disease during an epidemic than when the infection is less active. These conclusions, based on studies of the parasite in kittens, were reported to the American Society of Tropical Medicine by Drs. Henry E. Meleney and William W. Frye, of Nashville, Tennessee.

LIGNIN, one of the chief constituents of wood, and as yet one of the most puzzling to chemists and industrialists, has been made artificially in the U. S. Forest Products Laboratory at Madison, Wisconsin, by Drs. L. F. Hawley and E. E. Harris. This research followed pioneer work done previously by Dr. Hawley with Dr. Jan Wiertelak. The results have been reported to the American Chemical Society through its official journal. Lignin was made in sealed tubes, by heating cellulose, the most useful constituent of wood, at a temperature of 135 degrees Centigrade (307 degrees Fahrenheit) for periods up to eight days in length. The artificial lignin thus obtained gave the same reactions as the natural lignin to various chemical tests. It is not expected that this artificial lignin will be of immediate direct commercial importance. But the discovery of Drs. Hawley and Harris will eventually be of economic value, because it leads to a better knowledge of what lignin is and will do, and this knowledge in turn is of use either in getting rid of it or even in finding a profitable occupation for it.

GOLDEN snow often may be seen in the mountains of Glacier National Park late in the winter. The effect is caused by great numbers of brilliant canary-yellow insects, about one sixteenth of an inch long, covering the snow. Others float on standing pools of water, giving it a golden glow. These colorful little insects exist for a few days only, and are carried off with the run-off from the melting snow. Collectively they are known as "collembola," a name which, derived from the Greek, means "glue-pegs," and comes from their habit of exuding a sticky fluid which enables them to adhere to smooth surfaces. In lieu of wings, some species carry a caudal furcula which serves as a springing organ to catapult its possessor through the air. When not in use, this spring is folded forward under the body and kept in place by a convenient abdominal catch. Their common name, "spring-tails," is derived from this springlike arrangement, as probably is also the local name of "snow flea."