SCIENCE NEWS

THE GERM OF MULTIPLE SCLEROSIS

MEN and women of science working patiently together in the small, obscure neurological laboratory of the Westminster Hospital in London, England, claim to have discovered the smallest disease germ ever seen by the human eye. In doing so they believe they have paved the way to the conquest of some of the most mysterious and terrible diseases afflicting mankind.

The organism they declare they have isolated, identified and photographed is thought to be that of multiple sclerosis—commonly called "creeping paralysis"—once a rare disease in this country, but now not at all uncommon.

The germ is one of a group known as the filterable viruses, which are so minute they will pass through a porcelain filter, which catches all hitherto discovered organisms. Hitherto, these have remained invisible even under the most powerful microscopes. They include the forms of parasitic life causing infantile paralysis, encephalitis (sleeping sickness), measles, smallpox and some of the most deadly diseases of animals, such as distemper among dogs and pleuro-pneumonia among cattle.

This information is vouched for by Dr. Foster Kennedy, professor of neurology at the Cornell University Medical School and attending physician in charge of nervous diseases at Bellevue Hospital, New York City. He returned from abroad a few days ago after carefully reviewing the work done in the Westminster Hospital laboratory.

Dr. Kennedy reported that under the enormous magnification of 1,800 diameters glistening globules which seem to have life now can be seen and photographed. These are definitely claimed by Sir James Purves Stewart, neurologist of the Westminster Hospital, and Miss Kathleen Chevassut, the highly skilled technician who has actually conducted the experiments, to be the organism responsible for "creeping paralysis."

"While it is seldom wise to make positive predictions," Dr. Kennedy said, "it is quite possible that this work will lead to the discovery of the organisms causing measles, infantile paralysis, sleeping sickness, distemper among dogs and pleuro-pneumonia among cattle."

He recalled that in 1925 Mr. Barnard, who had cooperated with Dr. William E. Gye, of London, announced that his ultra-microscope had revealed the organism of chicken cancer. At that time Dr. Max Cutler, of the Memorial Hospital in New York, associated with the Cornell Medical School, was sent to England to check up the work of Barnard and Gye. His report did not confirm their announcements.

But this time, so important does Dr. Kennedy consider the results attained, an ultra-microscope has been ordered from Mr. Barnard, and Dr. Lewis Stevenson, neuropathologist, has been sent over to work in the Westminster Hospital laboratory until he has mastered the technique of Miss Chevassut and can reproduce her experiments. He will then return and attempt to repeat them in the new neurological laboratory of Bellevue Hospital.

"If this can be done," said Dr. Kennedy, "we shall feel reasonably sure that the organism causing multiple sclerosis has been discovered, and that we may be on the way to developing a serum with which to treat the disease. At present, I can only say that the work thus far is very hopeful. The experiments have been conducted with the utmost care, but until the same results can be obtained under entirely different surroundings—not simply in other London laboratories—we must consider the work as tentative only."

Aside from the development of Barnard's ultra-microscope, the detail of technique which seems chiefly to be responsible for the discovery is the making of cultures in a completely sterile atmosphere. A chamber a little smaller than an egg crate is exposed to short wavelengths—ultra-violet rays—until the air it contains has been sterilized. The technician's hands and arms also are sterilized and introduced into this chamber through a device which prevents contamination. Hitherto, research with the ultra-microscope has been inconclusive because it has seemed impossible to obtain uncontaminated cultures. Miss Chevassut's technique appears to be a great step forward in this direction, and to have made the isolation of "creeping paralysis" germs possible.

A blood serum, known as Hartley's broth, is used for the cultures. Virus from the cerebro-spinal fluid of persons suffering from the disease is introduced into the culture tubes in the sterile chamber and the tubes are closed and incubated.

When the cultures are examined under a magnification of 1,800 times, spherical globules in clusters appear. When separated they have two motions, one a Brownian movement or very rapid vibration associated sometimes with inert matter under very high magnification. The other appears to be a longer oscillation comparable to the movements of some living bacilli. The apparent organisms are too small to take a stain and can be seen only on a dark field with direct illumination. As yet no nuclear material is evident.

But the fact that these forms are discovered only in the virus taken from persons suffering from the disease and that they appear to multiply in cultures suggests very strongly that they are the first organisms of a filterable virus the human eye has seen and identified.

THE CLAUDE OCEAN POWER PLANT

AN act of sabotage at the last minute in the launching of the giant tubing being laid out into the Gulf Stream at Matanzas, Cuba, to bring cold water to the Claude sea power experimental plant, caused the total loss of the 6,000 feet of tubing recently, Georges Claude, French physicist and inventor, has informed *Science Service*.

This is the second time that his attempt to tap the cool depths of the ocean has ended in disaster, yet M. Claude announced in his cable that a third large tube of insulated sheet iron was being made in France and that it would be launched at the end of August. The first conduit was lost in launching last September.

Over a mile long, over six feet in diameter, the corrugated sheet iron tube when successfully placed will reach out from the Cuban coast and suck up water from a depth of over a third of a mile. This water will have a temperature of about 50 degrees Fahrenheit.

This will provide the cooling water for Claude's unique power plant which instead of heating water by burning fuel uses the relatively hot surface water of the tropical ocean which is 35 to 40 degrees warmer than the cooling water to be brought by the conduit from the depths.

Awaiting the laying of the third conduit there may be seen, on the shore at Matanzas, Claude's unique power plant that in trial operated successfully on waste hot water at Ougree on a Belgian river. It makes use of a boiler, turbine and condenser, like ordinary steam stations. But instead of being heated by a flaming fire, his boiler is at the temperature of surface water. Instead of being subject to hundreds of pounds of pressure, its pressure would be much less than that of the atmosphere outside.

Even the low pressure of the boiler would be higher than that of the condenser, and consequently steam from it would flow through the turbine to the condenser. Water from deep in the ocean would maintain the low pressure of the condenser by cooling and condensing steam from the boiler and turbine.

Because this process involves relatively small changes of temperature and pressure, large quantities of cool condensing water and warmer boiler water are required.

Although M. Claude's experiments are costing many thousands of dollars, the present power plant is experimental rather than commercial. He intends that it operate only a few months after the cold water conduit is finally laid. The information that the ocean power plant will give him will be used in the design and construction of a modest industrial power plant of about 12,000 kilowatt capacity.

Engineers accustomed to conventional power plants have not viewed M. Claude's experiments with great enthusiasm, but his record of achieving what others have called impossible has made many confident that his plans will succeed. M. Claude is a scientist and engineer of world-wide reputation. He invented the first successful process for making liquid air and liquefying other gases; he pioneered in the field of making liquid ammonia out of the atmosphere; he is the inventor of glowing red neon lights that shine on our streets at night. His inventions are capitalized at $150,000,000 in America alone.

ROOM TEMPERATURES

THE occupants of a room in which the thermometer registers 70 degrees Fahrenheit are not necessarily warm and comfortable. In spite of the correct temperature they may be miserably cold.

Radiation from cold walls will chill them, Professors A. C. Willard and A. P. Kratz, of the University of Illinois, told the American Heating and Ventilating Society at Minneapolis. Professors Willard and Kratz were reporting the results of extensive studies and experiments of the past twelve years.

"Entirely too little attention," they said, "has been given to the radiation effect of the inside surfaces of exposed wall and glass on the personal comfort of the occupants of heated rooms, especially during the coldest weather. But the occupant in the actual room is keenly conscious of this effect, and the colder the weather and the poorer the wall construction, the more conscious of his cold surroundings he becomes even though all 'breathing line' temperatures are exactly 70 degrees."

This breathing line temperature, which is used universally in heating calculations, was declared to be an unfair measure. It is taken five feet above the floor and does not indicate the true effect of room temperature upon the occupants.

The temperature at the comfort line, two feet six inches above the floor at the average height of the zone occupied by people, should be used. Here the air is always colder than at the breathing line, how much colder depending on the type of heating plant, heating unit and house construction.

ARCTIC CLIMATES

THE old idea that Greenland and other Arctic countries were once palm-filled tropical paradises is all a myth. These regions could not have been tropical, if for no other reason than that they have practically continuous night for several months each year. Even if it had stayed warm enough, the plants standing there in the dark would have starved for lack of sunlight.

This is one of the points raised in a discussion of ancient climates in the Arctic by Professor Edward W. Berry, of the Johns Hopkins University.

Professor Berry has found, upon examining all known kinds of fossil plants from the far North, that the great majority of them belong to temperate rather than tropical genera. In the more recent geological periods they included such trees and shrubs as alder, sweet-gum, beech, oak, elm, maple, hickory, tulip-tree and sassafras, all of which are decidedly temperate-zone plants. Some more or less tropical trees have been found, such as fig and cinnamon; but Professor Berry points out that cultivated figs generally ripen their fruits as far north as Baltimore, and that many of the trees that grow in tropical latitudes have their homes high up on the mountainsides, and are therefore really temperate-climate plants after all.

The plants of older periods, such as the coal age, have all disappeared from the earth, so that we can not judge their habits and climatic requirements with anything like certainty. Such of their relatives as have survived, however, get along very well in temperate regions.

THE BEHAVIOR OF WASPS

WASPS have a strong racial feeling. They will welcome strangers belonging to their own species, even though they come from nests many miles away. But if a strange wasp of a different species alights on the nest it means instant battle.

This in outline gives the results of experiments on wasps in a number of nests which Phil Rau, of Kirkwood, Missouri, hung up in his third-floor laboratory and studied in greater intimacy than most of us would want to bestow on the slim-waisted "hot-tails." Mr. Rau's data will be given in detail in a forthcoming issue of *The Journal of Comparative Psychology*.

Mr. Rau's collection contained three species of the genus *Polistes*. He found that in general if an insect of a given species were transferred to a nest of the same species it would either be welcomed by a committee of the "home folks," or at the very least be let tolerantly alone, to make itself at home if it chose. Sometimes a stranger wasp would become a permanent member of its host colony.

A wounded wasp introduced into a strange colony of its own species would frequently receive apparently solicitous attention from its sister insects. They would lick its injuries and massage its body and wings.

As an extreme case, Mr. Rau pinned to one nest a dead wasp of the "right" species which had been kept for several years in a museum case in an atmosphere saturated with creosote vapor. Most of the wasps paid no attention to the mummy. A few made mildly hostile gestures and then became indifferent. But one determined female apparently had opinions of her own about the strange-smelling intruder, for she attacked it furiously and was not content until she had bitten off both its wings. Then she retired and treated herself to a most elaborate and lengthy toilet.

When a wasp was placed in a colony of a different species, there was no friendly welcome nor even an indifferent toleration. Everybody was up in arms at once, and the stranger usually got very short shrift unless he were lucky enough to escape. The intruder would instantly become the center of a mass of struggling, biting, sting-thrusting insects.

Their hostility was just as great against the dead body of an alien as it was against a living insect. The same mummified, creosote-flavored wasp that roused the antagonism of only a single individual in a nest of its own species produced a general riot when it was pinned on the nest of either of the two other species.

ITEMS

THE earthquake which rocked Calcutta on July 2 was probably centered some distance to the southwest of the city, in the Bay of Bengal, according to the U. S. Coast and Geodetic Survey. After study of reports gathered from seismograph stations by *Science Service*, the survey's earthquake experts announced that the quake was centered at approximately 21 degrees north latitude and 87 degrees east longitude. Seismograph stations reporting the quake were located at Georgetown University, Washington; St. Louis University; the Dominion Observatory, Ottawa, and the stations of the Coast Survey at Tucson, Arizona; Chicago, Illinois, and Honolulu.

A FIELD office to help Central American countries lay out the route of the proposed inter-American highway is being opened in Panama City by the Bureau of Public Roads of the U. S. Department of Agriculture. It will be operated by Thomas A. Forbes and D. Tucker Brown, senior highway engineers, and Marcel J. Bussard, assistant highway engineer. An appropriation of $50,000 by Congress makes this cooperation with Central American countries possible to speed work on the international highway. The entire route through Mexico has been mapped and much of the road completed. In Panama a ferry and a highway near the Pacific entrance of the Panama Canal will be built as the result of a recent act of Congress. An initial appropriation of $1,000,000 has been authorized for this work, which will fulfill a treaty obligation to provide a convenient and effective permanent crossing of the Canal and the Canal Zone.

THE wide distribution of the fish tapeworm in North America was brought to the attention of students and public health workers by Professor Henry B. Ward, of the University of Illinois, at the DeLamar lecture at the Johns Hopkins School of Hygiene and Public Health. The fact that lakes and streams of the Great Lakes region and central Canada are heavily infested with these worms has not been generally recognized until recently. Much of the population in these sections of the country has become infected with the tapeworms as a result of eating raw or insufficiently cooked fish from these waters. The tapeworm passes one stage of its existence in fish and another in man or other warm-blooded animals. The eggs discharged from human or animal intestines reach the water by way of sewage and then infect the fish. Wild animals as well as man and domestic animals are a factor in the spread of these parasites.

X-RAYS have been found helpful in the treatment of many diseases for which they are not generally used. Among these conditions are boils, carbuncles, certain cases of pneumonia, erysipelas, inflammation of the kidneys, inflammation of the parotid gland and many other inflammatory conditions, Dr. Arthur U. Desjardins, of Rochester, Minnesota, told members of the American Medical Association at the recent meeting held in Detroit. Irradiation tends to destroy the white blood cells or leucocytes, which gather to defend the body against infection. It would seem that a destruction of these defender cells would do more harm than good, but Dr. Desjardins explains that the white cells contain a substance that enables them to destroy the invading germs. Irradiation, by destroying the cell, liberates the protective substance and makes it even more readily available for defensive purposes than when it is in the intact cell.