SCIENCE NEWS

Science Service, Washington, D. C.

SCIENTIFIC PROGRESS DURING 1925

(Continued)

Medicine

The causal organism of one type of cancer was isolated and photographed by means of the ultramicroscope, according to the claim of English workers.

The germ which causes distemper in dogs was discovered by Professor Robert C. Green, of the University of Minnesota.

Certain soil bacteria were found to have the same effect on plant growth as vitamins have on animal growth, by Dr. Florence A. Mockeridge, of Swansea, England.

A vaccine made from infected cattle ticks was found an effective protection against Rocky Mountain spotted fever.

Chicago bacteriologist found bacteria living in oil wells more than 1,000 feet deep. This is a record depth for living organisms on land.

Hoof and mouth disease of cattle was fought in Denmark with serum treatment instead of by slaughtering the herds.

Dr. A. Besredka, a Russian scientist working at the Pasteur Institute in Paris, discovered that deadly germs may be entirely harmless if planted in tissue on which they are not accustomed to prey.

An extract obtained from the liver of animals was found to be effective in lowering high blood pressure of human subjects and may prove to be as effective in its field as insulin is in treating diabetes.

Extract from the parathyroid glands was found to be useful in speeding up the healing of broken bones.

The causative organism of sleeping sickness, encephalitis lethargica, was, according to claims, identified as a minute filter passing organism.

A new synthetic substitute for cocaine which can be used as a local anesthetic, has been discovered in Germany. It was named "totokain" and is prepared from some of the intermediate products in the manufacture of artificial rubber.

The thymus gland, an obscure ductless gland in the neck, was found to have influence on egg production in the case of pigeons.

Rats from which the thyroid gland has been removed, and which were suffering from cretinism as a result, were made to grow normally again by extra doses of pituitary extract.

Propylene, a gas closely related to ethylene, was found to possess important anesthetic powers.

Vitamin E, the presence of which in foods is necessary for reproduction of offspring, was shown to be present in a large variety of vegetable and animal substances.

A process of quantitatively measuring the flow of the blood, sought for during the past two centuries, was discovered at Yale University.

The League of Nations established the broadcasting of health reports from a radio station in French Indo-China, so that countries of the world might be kept informed of disease conditions, and warned of alarming changes in the plague areas of the Far East.

Complications from scarlet fever, such as inflammation of the joints, infections of the ear, nose and throat, can be avoided by early use of the antitoxin perfected by Dr. G. F. Dick and Dr. Abraham Zingher, according to reports made by them.

Milk, olive oil and some other foods which had been exposed to ultra-violet light were found to have the same curative effects on children suffering from rickets as doses of cod-liver oil or exposure of the patients themselves to ultra-violet rays.

Researches at the Carnegie Institution's Department of Genetics showed that determination of sex must be considered from a physiological, chemical and biological standpiont, and that changes in the rate of living of the organism may be even more fundamental in determining sex than the make up of the cell itself.

A new and powerful antiseptic, derived from the coal-tar product resorcinol and called "hexyl-resorcinol," was made by Dr. Veader Leonard, of Johns Hopkins.

A new X-ray machine, in which the photographic plate is exposed only when the heart is quiet between beats, made it possible to take clearer X-ray pictures of conditions in the lungs, was developed at the University of Pennsylvania.

A new cure for hookworm, as effective as carbon tetrachloride, was discovered by Drs. Maurice C. Hall and J. F. Shillinger, of the U. S. Department of Agriculture.

Physics

Penetrating radiation of cosmic origin was discovered by Dr. R. A. Millikan to be made up of "ultra X-rays" a thousand times shorter than the shorter and hitherto most powerful rays known. It is believed they are evidences of the formation of matter throughout all space.

Cathode rays, shot through a metallic window in a vacuum tube, were found to kill bacteria and insects and produce other striking physiological and physical effects.

Professor Gilbert N. Lewis announced a new theory of radiation based on the Einstein view of time, which makes a distant star and the eye-ball of an observer come into virtual contact.

A method for making sheets of steel so thin that they could be seen through like glass was invented by Dr. Karl Mueller, of Berlin.

Hafnium, one of the latest discovered chemical elements, has been found to be of practical value in the making of filaments in electric lights.

An ether drift experiment, by Professors A. A. Michelson and H. G. Gale, of the University of Chicago, in which the speed of two beams of light, one traveling east and the other west, when compared, indicated that the ether is not appreciably dragged along with the earth in its rotation, confirming Einstein's theory.

Evidence of ether drift, contrary to the famous Michelson-Morley experiment basic to the Einstein theory, was obtained by Professor Dayton C. Miller, who set up an interferometer on Mt. Wilson, 5,000 feet above sea level, and found positive displacement of fringes when beams of light conflicted. This is said by some authorities to overthrow the theory of relativity.

Measurements of the displacements of the dark lines in the faint companion star Sirius, the "dog star," made at the Mt. Wilson Observatory in California, show close agreement with the predictions of Einstein and of Professor Eddington, of Cambridge University in England, and indicate that the star is so dense that if a pint of it could be brought to the earth it would weight twenty-five tons.

EXPERIMENTS ON CANCER

A CABLEGRAM from Dr. W. E. Gye, of London, whose cancer experiments are attracting great interest among doctors and the public, was read at a special meeting of the Baltimore City Medical Society. The message indicated that the delicate tests, which led to startling reports of a cancer microorganism being seen and cultivated, are being repeated in efforts to confirm or disprove the results.

The cable, which was read by Dr. George A. Soper, managing director of the American Society for the Control of Cancer, was a reply to his letter asking Drs. Gye and Barnard whether their experiments are being confirmed.

Dr. Soper, who spent three months in Europe recently, investigating cancer research work, stressed the point that such difficult experiments as the work of Gye and Barnard, and the use of lead injections in the treatment of cancer, as reported on by Dr. Blair Bell, of Liverpool, must be confirmed by men of at least equal skill.

"The technique of Gye and Barnard is so refined and so delicate that not many scientists in the world are trained sufficiently to repeat their experiments," and Dr. Soper. "The best of cancer investigators are sailing on uncharted seas, and errors are difficult to avoid."

Progress in various angles of cancer research in the United States was described by Dr. William H. Woglom, of the Institute of Cancer Research, at Columbia University. "Although the laboratories have not yet succeeded in establishing a cure for cancer, the situation is not hopeless," Dr. Woglom pointed out. "It is not as though we were seeking a cure for hardening of the arteries or some condition where the damage appears to be irreparable. Malignant tumors do sometimes recede. This occurs in scarcely one per cent. of spontaneous tumors in mice, and in an infinitely smaller percentage of cases in man; yet the fact remains that the body does sometimes succeeed in overcoming the malignant cell."

How nature overcomes the wild cells of a cancer that grows spontaneously in a human being has not been studied because of the rarity of the phenomenon and the difficulty of such investigation. But Dr. Woglom described studies that are being made on rats with transplanted tumors in which the type of tumor that can be overcome by the body is compared with the tumor that flourishes. Study of 7,000 rat cases shows that on about the tenth day the tumor takes a turn that decides whether it is to continue to grow vigorously or to succumb to immunization by the normal body cells.

"There is not a single aspect of the cancer problem that is not under investigation somewhere in the world," concluded Dr. Woglom. "But such work can not be hurried. False trails must be investigated before they can be recognized as false. Experiments are wiped out by animal epidemics and have to be repeated. The ideal cure for cancer would be some agent, which, after intravenous or subcutaneous administration, could seek out and destroy the cells of a tumor without injuring the normal tissues of its bearer. Needless to say, the laboratory has no such remedy to offer as yet."

THE CAUSE OF BREAST CANCER

MOTHER mice which had bred a number of litters of young which were prevented from suckling their babies developed cancer far more frequently than normal mice. This is the latest contribution to the subject of cancer, presented before the American Society of Zoologists, in session at New Haven, Conn., by Dr. Halsey J. Bagg, of the Cornell Medical College. Mice that were allowed to suckle one set of babies and were kept away from the next, alternately, developed cancer after a shorter period than those kept from their babies entirely.

As a result of the experiments, Dr. Bagg is convinced that breast cancer in mice may be caused by stagnation and decomposition of the secretion in the breast during the period when the mother mice would normally give milk to their young.

Further evidence along this line was obtained by tying some of the breasts in some mice so that normal drainage of the secretion was prevented. In such cases he found that cancer tended to develop on the side that had been tied.

Dr. Adair, of Cornell, has shown that out of several hundred human cases of breast cancer a high percentage had abnormal activity of the breast glands, due to various causes. Only a small number of these cases had normal gland activity.

Whether cancer is caused by an organism or by abnormal cell growth, or whether a combination of the two is necessary, was discusssed at length. Dr. James Murphy, of the Rockefeller Institute, expressed the opinion that Gye and Barnard, of London, have not presented sufficient evidence that a cancer germ exists. Their success in transmitting cancer of chickens by means of a filtrate, free from cells may be due to the presence of some enzyme causing abnormal growth, rather than to ultramicroscopic organism which Gye and Barnard regard as responsible for the disease. He considered the fact that cancer can be produced in mice by application of coal tar to the skin as evidence against the theory that cancer is caused by an infectant.

When the definite cause of cancer is known, it will not only be valuable information for the cancer specialist, but it will help physiologists to understand normal cell growth.

Heredity may or may not be an important factor in cancer cases among human beings, but an experiment with laboratory mice, described by Dr. L. Strong, of Harvard University, indicates that heredity may play a part in unusual circumstances. He followed the development of cancer in a long family tree of mice, all descended from one original parent stock. After a long period of inbreeding there were two strains of mice, one of which was one hundred per cent. susceptible to cancer, whereas the other was much more resistant. This has no direct bearing on cancer in man, because such inbreeding of cancerous persons, as it is done artificially in the laboratory, is not likely to happen among human beings.

A NEW COMET

THE eleventh comet of the year has just been picked up by G. E. Ensor, an amateur astronomer at the Cape of Good Hope, where a southern branch of the British Royal Observatory is maintained. It is now in the constellation of Reticulum, the net, and is moving northeast into the neighboring constellation of Horologium, the clock, according to Dr. Harlow Shapley, director of the Harvard College Observatory. Both of these constellations are far south of the equator and can only be seen easily from southern latitudes. Its motion, however, may bring it into view in the southern United States, and, as it is now of the eighth magnitude, it could be seen with small telescopes.

With eleven comets discovered since January 1, some of which were new while others were old friends returning for one of their periodic visits, 1925 will go down in the history as one of the most prolific years for comets on record. The nearest approach in recent years to this record was in 1921, during which seven were found, but two of these were doubtful objects whose cometary nature was not fully established. All found so far this year, with the exception of the new one, have been observed by many astronomers and their orbits have been accurately computed. Doubtless other southern observatories will make observations of the new visitor, and as soon as its position at three different times is found, its path can be calculated.

This is the second comet this year to be discovered in South Africa, for on March 24, William Reid, an amateur astronomer living near Cape Town, discovered a comet which now bears his name. Another South African discovery of the year was that of a new star in the constellation of Pictor by R. Watson, another amateur astronomer, and a telegraph operator by profession, who noticed a strange star in the heavens when he was returning home from his work in the early morning. Two other of the year's comets were found by Americans, Professor George Van Biesbroeck, of the Yerkes Observatory, and Leslie C. Peltier, an amateur astronomer; while two others were found in Russia.

It is only coincidence that has brought this large number of comets near the earth this year, and no dire results may be expected from them. In earlier times, however, comets were supposed to portend great catastrophes, so it is a matter for thankfulness that most people no longer believe in these old superstitions.

ITEMS

THE record for minuteness in its class is held by a tiny fish shown at the meeting of the American Society of Zoologists at New Haven by Dr. E. W. Gudger, of the American Museum of Natural History. The midget is exactly 30 millimeters, or less than 1¼ inches, in length, and belongs to the semi-parasitic genus Remora. The fish in this group are parasitic only to the extent that they "hop a ride" on larger fishes, attaching themselves by a sort of vacuum disk that grows on the tops of their heads. This saves them the labor of swimming for themselves, and they pick up a living by swallowing bits of food scattered by their unwilling carriers at mealtimes. The next smallest specimen, which Dr. Gudger also showed, is a trifle over 1¾ inches in length.

ORCHIDS, which we carry in the habit of thinking of as very beautiful— and very expensive— exotic flowers, may sometimes become a serious economic pest, according to a paper presented before the Botanical Society of America by Dr. Melville T. Cook, of the Porto Rico Experiment Station. "Within the past year cases have come to my attention," he states, "where orchids of two species have proved very destructive in citrus groves. The orchids produce enormous growth of roots which cover the branches and causes a strangulation which frequently results in the death of large branches. The seeds are produced in great numbers and when the pests are once established in groves where the humidity is high, they spread very rapidly."

THE color of chickens seems to be controlled by a balance of glandular activity between their sex glands and the thyroids, situated in the throat, according to a paper presented by Professor Harry Beal Torrey and Benjamin Horning, of the University of Oregon, to the New Haven meeting of the American Society of Zoologists, giving the results of experiments on brown leghorn fowls. When thyroid substance was included in the diet of cockerels and capons, their feathers became darker as they matured, and the same was observed to a certain extent in the case of an unsexed female fowl. Normal hens, however, did not respond to the treatment; their feathers remained the same color throughout. The investigators therefore conclude that the darkening of the feathers was due to the action of the thyroid material, but that the female sex glands secrete an antagonistic substance that nullifies its action in normal hens.

THE night-blooming cereus, one of the most beautiful flowers of the desert, is not wholly a flower of the night, as has commonly been thought. The annual exhibit of scientific work at the Carnegie Institution of Washington includes two photographs of these rare plants being visited by bees that fly only in the daytime. Dr. D. T. MacDougal, of the institution, explains that the flower does not close with the coming of the first signs of dawn, but remains open for a time, usually giving the bees an hour or two of early daylight to work by, and thus freeing itself of total dependence upon night-flying moths for the important process of pollination.