SCIENCE NEWS

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PAPERS PRESENTED AT THE NEW ORLEANS MEETING

A TROPICAL scourge afflicting descendants of the Maya living in coffee-growing highland regions of Guatemala can now be wiped out through research by Dr. Richard P. Strong, Harvard's eminent investigator of tropical diseases, who described his discovery of the cause and treatment in his lecture at the opening meeting. Dr. Strong believes that a medical expedition could completely conquer this disease before it spreads to other parts of the tropics of the Americas. More than half the Indians in some of the villages have unsightly tumors on their heads, caused by a worm, called scientifically *Filaria onchocerca*. After proving that the worms cause these abnormal growths, Dr. Strong searched for the manner in which the natives are infected. Knowing that most of the worm infections that plague other warm parts of the world are carried in one stage by insects, he considered the common biting insects of the regions as suspects. A single kind of fly, known as the coffee fly and related to the turkey gnat of southern United States, was found guilty. It breeds only in the swiftly flowing streams that are the only water supply of the region. When coffee flies bite a sufferer from the disease they are infected with one stage of the worm, which then develops in the fly and is passed on to a well person bitten by the fly. The way the disease is carried from insect to man and man to insect is much like the history of the parasite causing malaria.

DR. FREDERICK EBERSON, of Mount Zion Hospital and the University of California Medical School, reported that he had succeeded in making visible microbes appear and grow where only a carefully filtered fluid from the brain and spinal cord of infantile paralysis victims had been planted. The cause of infantile paralysis is attributed to a microbe too small to be seen with a microscope and capable of passing through the pores of the finest filter. A special germ food used by Dr. Eberson consisted chiefly of minced sheep-brain tissue contained in a veal broth. Into a test-tube of this material he placed a very small amount of filtered substance from the brain and spinal cord of monkeys ill with the disease. This test-tube culture developed the very small but visible germ after it had been kept at the temperature of the human body for several weeks. By transferring a tiny drop of the growth in one tube to another, he kept the disease strain alive and saw it multiply greatly. The crucial test was when Dr. Eberson infected monkeys with the visible germs, saw them develop poliomyelitis in typical severity and then grew the visible germs from the invisible organisms in the fluids of their diseased nervous system.

DR. CARL CASKEY SPEIDEL, of the University of Virginia, who received the $1,000 prize of the American Association for a suitable paper presented at New Orleans, reported that living, growing nerves of the tadpole sprout from the spinal cord and, like a telephone wire being strung from a central office to a home, to go directly to the muscle or sense organ they were destined to connect with the central nervous system. With his microscopic observations which revealed the growth of nerves in the living body for the first time, Dr. Speidel settled conclusively a controversy in neurology that has raged since 1860 when the German biologist, Wilhelm His, suggested that nerves grow outward just as Dr. Speidel finds they actually do. The opposing theory was that nerves grew by the connecting up of cells already existing in the region between the central nervous system and the part of the body to be controlled by the nerve.

SUCCESSFUL immunization of an animal against a many-celled parasite has now been accomplished, and this may be the first step toward the development of a preventive of tapeworm and other parasitic infections in human beings. Professor Harry M. Miller, Jr., of Washington University, reported that by injecting portions of a tapeworm into rats it is possible to prevent the development of tapeworms from eggs fed later to the rats so protected. The worm thus baffled by this immunizing injection lives in the intestine of the cat and has its larval stage in the liver of the rat. Although it has been possible to immunize and protect animals from disease caused by typhoid and many other one-celled bacteria, more complex invaders have not hitherto been stemmed by any attempts at immunization. Professor Miller's research is therefore hailed as encouraging.

THE extract of the adrenal cortex glands may be a hormone necessary for the proper functioning of all the tissues of the body, according to Professor Frank A. Hartman, of the University of Buffalo. This extract, called cortin by Professor Hartman, has been used in the past to rescue from the brink of the grave sufferers from Addison's disease. Now Professor Hartman has evidence that cortin is resistant to disease toxins and necessary to normal growth, kidney functions and other bodily mechanisms.

EVIDENCE of a new hormone in the body which regulates cell activity and which might be able to check the growth of cancers when given in concentrated form was reported by Drs. Donald C. A. Butts, Thomas E. Huff and Erwin C. Manz, of the Emery Laboratory, Hahnemann Hospital and Medical College, Philadelphia. The possible hormone is secreted by the spleen, blood-forming organ of the body, and is either itself a sodium compound or is capable of governing the body's use of sodium. Normally this secretion or hormone is dissipated about the body by means of the circulating blood from which the tissues of the body absorb and store it

for their particular needs and regulation. The greater the activity of an organ of the body, the greater its demands for this suspected secretion. If there is a tumor, where cell activity is at its greatest, the secretion is sent there at the expense of other tissues of the body. This results in an increasing amount of sodium about the tumor, with less sodium in the spleen itself.

THAT a vitamin has been manufactured in the laboratory by strictly chemical methods for the first time, Drs. Charles E. Bills and Francis G. McDonald, of the Mead, Johnson and Co. Research Laboratories, Evansville, Indiana, reported. They synthesized vitamin D, the so-called sunshine vitamin, by treating ergosterol with nitrogen monoxide gas and obtained the potent vitamin without the use of ultra-violet radiation. At present vitamin D is made by shining ultra-violet light on ergosterol, whereas before the relationship between vitamin D and sunshine was discovered five years ago, children had to take cod-liver oil to obtain vitamin D that prevents rickets. The synthesis of the vitamin is carried out in solution with methyl alcohol, ether and ethyl acetate at low temperature and with rigid exclusion of oxygen. An extremely pure non-crystalline preparation of vitamin D was described by Drs. Bills and McDonald. In company with four European laboratories, they have also produced crystalline vitamin D. The purest of these substances is claimed to be the most potent drug known.

JUST what happens within the brains of persons mentally ill, anesthetized or drugged, promises to be discovered in the near future through experiments on human beings in which blood is extracted safely from the artery leading to the brain and from the vein carrying blood away. The new method of chemical and physical investigations of brain activity was described by Dr. Abraham Myerson, of Boston. Through a careful operational technique, Dr. Myerson and his associaties found it possible to puncture with a syringe both jugular vein and common carotid artery, to withdraw relatively large quantities of blood, and then to analyze this blood to see what materials in it the brain uses. The patient need not be unconscious as the operation is performed under novocain local anesthesia. The cause of many kinds of insanity and the usefulness of various treatments may be decided from experiments on the insane by this new technique. That the brain either uses or withdraws more sugar from the blood than does the arm is one of the first conclusions reached through use of the new method. The brain uses or stores during anesthetization less than half the sugar used normally.

ANOTHER difference between the nervous, energetic person, who usually has a high metabolic rate, and the slow, easy-going character, whose metabolism processes are often sluggish, was reported to the American Association for the Advancement of Science by Dr. Charles Sheard and Charlotte Purdy, of the Mayo Foundation, Rochester, Minnesota. Persons whose internal fires burn at a rapid rate were found to generate small differences in electrical potential between two points on their arms or legs, while persons with low metabolic rates have higher electrical differences between like points on their bodies. Although this electrical characteristic, measured between points about three inches apart on the arms and legs, is the same as that which power companies account for in terms of volts and thousands of volts, on human beings its magnitude is limited to just a few thousandths of one volt. Potential differences as measured on the skin are also increased by an emotional storm or a hearty meal, but emotions and meals do not have as much influence on the electrical measurement as on metabolism.

PROFESSOR J. WILLARD HERSHEY, of McPherson College, Kansas, reported that oxygen and nitrogen, chief constituents of the air, are not alone sufficient to keep life aglow. His experiments showed that animals die after living ten days to three weeks in air from which carbon dioxide and rare gases, helium, argon, krypton, etc., are removed. Professor Hershey predicted that helium atmosphere would be used in fighting diseases just as oxygen atmospheres are now utilized in treating pneumonia. Large factories and office buildings supplied with synthetic atmospheres in which oxygen is mixed with helium instead of nitrogen are also foreseen by Professor Hershey as a result of his tests.

VERTEBRATE animals have been traced back to an obscure race of sea scorpions, now known only as fossils, by Professor William Patten, of Dartmouth College. The connection between the highest vertebrate forms and these humble ancient arachnids of a thousand million years ago links through the extinct group of subfishlike creatures called ostracoderms. For years Professor Patten has held for an ancestry of vertebrates through ostracoderms, but certain fossil evidence has been lacking. Now, from the island of Oesel, in the Baltic Sea, come well-preserved ostracoderm specimens that fill the gap. They show how the face of the vertebrate type of animals was founded by the union of a number of skeletal arches in the mouth region of the ostracoderm. The outstanding feature of the change was the shift from the lengthwise, slitlike mouth of the invertebrate type, opening sidewise, to the typical crosswise mouth of the vertebrate type, with jaws that work up and down.

EVIDENCE that roaches, among whose numbers are some of our worst house pests, evolved from termites, which sometimes literally eat our houses from under our feet, has been found in a species of wild roach living in the Appalachians and in certain localities in the Pacific Coast area. This was reported to zoologists in a communication from Dr. L. R. Cleveland, Elizabeth P. Sanders and S. R. Hall, of the Harvard Medical School. The evidence was literally found in the roaches, for it consists of certain one-celled animals, or protozoa, hitherto known only from the digestive tracts of termites. These protozoa serve their termite hosts by digesting the wood which is their exclusive diet. Without their internal equipment of protozoa the termites would starve, as Dr. Cleveland demonstrated several years ago,

when he shared the association's annual thousand-dollar prize for a paper on his discovery. Like the termites, these woodland roaches are wood-eaters, and their internal protozoa apparently do their digesting for them.

DIETS for children are scrutinized for mineral contents, for the benefit of growing bones and teeth and other young tissues. From experiments reported before the American Society of Plant Physiologists by Dr. R. H. Carr, of Purdue University, it would appear that something of the same sort is in order for plants also. "It has been found," he said, "that the ashes of wheat, oats, alfalfa, tobacco and strawberries vary greatly according to the different soil types, even to such an extent that the 'mold' or 'pattern' of the plant and its degree of usefulness has been modified. Strawberries grown on a certain clay soil were found to be so highly mineralized that they remained firm and marketable four days longer than the same variety grown on a near-by loam soil. Wheat grown on a certain silt soil was found to contain 20 per cent. more ash and to produce a larger loaf of bread than the same variety grown on a productive loam soil in the same locality."

ARTIFICIALLY lengthening and shortening the daylight period for plants, for a number of years a scientific success, has been proved to be economically practicable by experiments carried on at Ohio State University by G. H. Poesch. He found that by shading his chrysanthemum greenhouses with black cloth he could produce an appreciably earlier marketable crop of flowers of correspondingly higher value. Conversely, he found that with plants responding to longer instead of shorter days, it was commercially practicable to give them four hours' extra illumination each day with 75- to 150-watt lamps. The current cost for one of the flower varieties used in his test amounted to only half a cent a stalk of the marketable flowers.

ENGINEERS who two centuries ago first attempted to master the Mississippi River, should have begun at Cairo, Illinois, where the lower Mississippi begins, and not near New Orleans, where the river reaches the Gulf of Mexico, it appears from a report by Professor Floyd Nagler, of the University of Iowa. If engineers had started at Cairo with their dikes and levees and proceeded downstream, the folly of trying to exclude the Mississippi from all the surrounding plain would have been apparent. As it was, he stated, they began at the river's mouth and a full century of argument has been required to demonstrate conclusively that the Father of Waters must have several outlets into the gulf. The problem, he concluded, has been made one of flood protection where it should be one of flood passage.

A MILLION and a quarter square miles, or over forty per cent. of the area of the United States, comprising most of the best farm lands, is unwillingly shipping its tillable surface to Louisiana, which does not want the soil. The shipment is constantly on the way, *via* the Mississippi and its tributaries, to be dumped at the entrance to the Gulf of Mexico, as extensions of the troublesome and constantly growing Mississippi delta. The magnitude of the erosion menace was graphically shown in U. S. Coast and Geodetic Survey maps displayed at the scientific exhibit at New Orleans. Through two great breaches in its banks, called "crevasses," the Mississippi has poured silt to form over 40,000 acres of swamp, useful only for breeding muskrats. And constantly, under the waters of the gulf, this costly mud piles up new shoals which keep the scientists of the Coast and Geodetic Survey always on the alert because of their menace to navigation.

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