SCIENCE NEWS

Science Service, Washington, D. C.

THE DISCOVERY OF A RADIOACTIVE ISOTOPE OF SODIUM

DISCOVERY of a long-lived radioactive isotope of sodium, whose atoms are similar to the ordinary variety of the metal, but have a slightly different weight and are radioactive, is reported by Professor L. Jackson Laslett, of the University of California, in the current issue of the *Physical Review*.

This new discovery is not to be confused with artificially radioactive sodium itself, discovered three years ago by Professor E. O. Lawrence, of the same university. Professor Lawrence's discovery is believed to be of medical value because it is a cheaper source of gamma rays, useful in treating cancer, than radium and because sodium is a constituent of salt, which can readily be injected into the body.

Positrons, like the more familiar electrons in mass, but with the opposite kind of electric charge, are emitted by the metal whose atomic weight is 22. It has an unusually long life for an artificially radioactive material, it is reported, the period during which half of it will be decomposed being about three years. Heavy hydrogen atoms, speeded up by means of the cyclotron, were hurled at a magnesium target to produce the sodium isotope. Seven months of observation and testing determined the "half-life" period of the element. Positrons are one of the newly discovered "building blocks" of the atom and have not been frequently observed as a part of radioactive radiation.

At the same time, Dr. Harold Walke, of the University of California, reported the discovery of an additional radioactive isotope of potassium. The new member of the potassium family has an atomic weight of 42. Other radioactive potassium isotopes have enabled scientists to calculate the age of the earth.

VACCINATION AGAINST INFANTILE PARALYSIS

NEW hope of an effective vaccination against infantile paralysis is contained in research upon monkeys by Dr. Sidney D. Kramer, of Long Island Medical College. It is a simple and safe procedure as it would be applied to children, if and when its development reaches that stage. At present the experimentation is limited to monkeys; the only animals that can be used for infantile paralysis research because, aside from human beings, they alone have been found to contract the disease. The new preventive process is a sort of intranasal vaccination. It would consist of spraying into the nose a harmless solution of a hormone extract, called pituitrin S and a mixture of adrenalin and ephedrine, called adrephine.

One problem was: Why do monkeys, 100 out of 100 of them, contract infantile paralysis when exposed, whereas incidence of the disease in the human population is only about 1 out of 1,000 in adults and 1 out of 500 in children? Dr. Kramer's latest researches "make a man out of a monkey," as he put it, so far as polio immunity is concerned. He has a method of making half to three quarters of the monkeys immune. It consists of nose spraying with the solution of pituitrin and adrephine twice a day, followed some four hours after the first spraying by a dose of infantile paralysis virus that would be invariably fatal to untreated monkeys. Most of the monkeys so treated not only resist the attempted infection, but are found to be immune to the disease.

Dr. Kramer does not suggest that human beings be subjected to the danger of having the virus placed in their noses, but with the virus widely distributed as it is thought to be, it is possible that an intranasal vaccination can be achieved by spraying with the pituitrin-adrephine mixture and allowing the virus to find its way naturally into the nose and thus join in producing the immunity. This is the basis for the hope for eventually achieving a practical method of vaccination. The treatments would be started in the early summer before the time for the peak of the epidemic arrives.

The spray is found by Dr. Kramer to cause a notable mobilization of certain white blood cells in the nose just under the mucous membrane, and around the endings of the nerves of smell, which are located in the upper part of the nose. These nerves have been demonstrated to be the avenue of entry of the virus into the brain and spinal cord of the victim.

The drug, ephedrine, contained in Dr. Kramer's spray is already widely used medically in treatment of colds and other respiratory infections, and adrenalin is used to relieve asthma. The pituitrin is not placed in the mixture because of its hormone nature, but because it prolongs the action of the adrephine.

Dr. Kramer is working on other aspects of the polio problem. He is one of about a score of investigators in all parts of the country who have been able to concentrate on the problem of infantile paralysis through support from the Georgia Warm Springs Foundation, which consisted of 30 per cent. of the proceeds received from the 1935 Birthday Ball which honored President Roosevelt. Further support of such researches is one of the objectives of the new National Foundation for Infantile Paralysis just announced by President Roosevelt.—WATSON DAVIS.

DANGER IN THE USE OF SULFANILAMIDE

MEDICINE'S spectacular new weapon against a host of infections, the drug sulfanilamide—also known as prontosil and prontylin—is gradually revealing itself as having occasional toxic by-effects. In the forthcoming issue of its *Journal*, the American Medical Association gives space to eight articles that cite untoward reactions in certain patients following the use of the drug.

Sulfanilamide sprang into front page eminence last winter when, according to reports, it was used to treat the septic sore throat of Franklin D. Roosevelt, Jr. Miraculous benefits have since been reported through the use of this drug in other streptococci infections and also in meningococci, pneumococci and gonococci infections.

From Milwaukee comes the report of a case of acute hemolytic anemia during treatment with sulfanilamide. Chicago produces a case of severe loss of vision resulting from toxic optic neuritis after treatment with the new drug. New Orleans reports four cases of skin eruptions among patients receiving the drug. Baltimore adds two similar cases. Cleveland reports severe allergic manifestations in two patients. Four cases of a peculiar skin eruption have occurred in New York City when patients taking the new agent sat in the direct sunlight. Los Angeles reports one patient with an untoward skin reaction. Sioux City, Iowa, has a similar story to tell. Atlanta, Ga., has nothing negative to report. On the contrary it tells of the successful use of artificial fever in combination with sulfanilamide in treating gonococci infection.

The reports are not presented to detract from the value of the new drug but to warn physicians that care must be taken in its use. Most of the physicians reporting think it possible that the skin eruptions represent an allergic cutaneous reaction to the drug.

NICOTINIC ACID IN THE PREVENTION OF PELLAGRA

PATIENTS in certain southern hospitals suffering from pellagra, serious skin and nervous disorder resulting from a dietary lack, are now being given doses of nicotinic acid to test its pellagra-curing power. The tests are a sequel to the discovery by C. A. Elvehjem and R. J. Madden, agricultural chemists at the University of Wisconsin, that nicotinic acid will prevent and cure black tongue in dogs. This disease is generally considered the canine counterpart of human pellagra.

Similar diet tests made on inmates of orphanages and other institutions in the South enabled the late Dr. Joseph Goldberger, of the U. S. Public Health Service, to prove that pellagra is due to lack of a vitamin found in fresh meat, milk, fresh vegetables and yeast. The vitamin has been variously called B, G, P–P, and now is generally referred to as the anti-pellagra vitamin, to avoid confusion with other vitamins. The disease is characterized by a skin rash and nervous symptoms. Many pellagra patients have become demented as a result of the disease. In the past it has been especially prevalent during hard times in the South, and is sometimes called the "hard times disease," because of the vitamin-lacking diet of salt pork, mush and molasses which the poor people lived on at such times.

Nicotinic acid, which may turn out to be the anti-pellagra vitamin, is present in small amounts in various plant and animal tissues and is also found in tobacco. In explanation of the effect of nicotinic acid, Drs. Elvehjem and Madden suggested the theory that the acid is present, and therefore probably essential, in one of the enzymes that transfers oxygen from the blood to the cells of the body. Apparently animals can not build the vitamin from food compounds but must get it ready made.

The investigators, aided by F. M. Strong and D. W. Wooley, have also succeeded in distilling a crystalline form of the vitamin from liver. They call this nicotinic acid amide and find it about as effective as commercial nicotinic acid in curing black tongue.

DISEASE IN CHINA

DR. J. L. MAXWELL, of the Henry Lester Institute of Medical Research in Shanghai, reports that the institute has now completed its third full year of work. Neurosyphilis has increased in China as a result of the official and unofficial warfare that has disturbed that country for the past quarter century.

According to a résumé of the report in the *Lancet*, "During the last 25 years a licentious soldiery has overrun the countryside and has raised the incidence of neurosyphilis both by spreading infection and, according to Dr. Maxwell, by inducing a state of nervous strain in the rural population."

Typhoid fever, a rarity among the Chinese population thirty years ago, has now become one of the commonest causes of admission to hospitals and at the top of the list of deaths from infections. Medical and health authorities can not explain why this disease should have increased so during the period in which cleanliness and water supplies have "vastly improved" along the coast and inland towns. Appendicitis has also increased greatly, particularly among the wealthy city population. This, it is thought, may be due to changes in diet. The medical institute has carried out studies of dietetic defects and nutritional diseases in the rural districts and among the factory workers in towns. More than half of the younger factory workers show signs of malnutrition, mainly "from lack of animal fats and first-class protein in their diet." Commenting on the work of the institute, the editor of the *Lancet* states: "It seems tragic that such valuable work should receive a check. We are glad of an assurance that the institute has so far escaped damage and we may hope that Dr. H. G. Earle and his 30 assistants will soon be free to continue their work unmolested."

RADIO CONTROL OF MODEL AIRPLANES

THE much-pushed-around radio amateurs who have continually "worked" the unexploited portions of the radio spectrum of wave-lengths, and then found themselves pushed out as soon as commercial possibilities came into being, now have a new field of activity. It is radio, remote control of small engine-powered model airplanes.

Model airplanes, with tiny but powerful gasoline engines, have become increasingly popular throughout the nation because of their performance in distance, speed and altitude. And with some of them now 13 feet in wingspan, they are not so tiny either. The increasing presence of such powered models around airports has now led to a ban on their uncontrolled use by legislation despite cries from the model plane enthusiasts. And in answer to those cries has come an answer from the radio "hams." The answer is radio, robot control of model airplanes so that they come outside the "uncontrolled" phrase in the laws.

Two Hartford radio amateurs, Ross A. Hull and R. B.

Bourne, describe, in the current issue of the technical radio magazine *QST*, a control method of using a light-weight radio receiver aboard powered model airplanes. Mr. Hull is associate editor of *QST*, while Mr. Bourne is employed by the Maxim Silencer Company at Hartford. Such controlled model planes would be useful for anti-aircraft target practice without risk to pilots. So far control has only been achieved on the rudder of a 13-foot wingspan craft, but progress is being made on radio control of the elevators and ailerons of the craft.

The problems the amateurs have tackled are those which England has solved with her radio robot airplane which gave demonstrations last year. The details of operation of the large-sized British plane have never been announced because of military secrecy and wartime usefulness. But the methods of Messrs. Hull and Bourne are no secret. Any enthusiastic radio amateur can build a similar controlling mechanism. And because all radio transmission must be in charge of a licensed radio operator, it looks as though the radio and the airplane amateurs would form a permanent alliance.

ITEMS

EXHAUSTED Soviet oil fields are being successfully rejuvenated by the use of heated compressed air. A field of the Mayneft Oil Trust which was abandoned in 1930 as unproductive has been put into steady production again by the use of the new process. So successful has the method been that one of the fourteen wells in the field is producing 550 tons of oil a month as compared with 350 in 1926 when the well was rated a producer. Compressed air at 600 degrees Centigrade is pumped into the wells, and oil contained in the porous sands at the bottom is forced by the blast of air to a well, from which it can be pumped out. Light oils are evaporated by the heated air and returned directly to the surface of the ground by the air exhaust.

MINERALS of different chemical composition but which look alike and are difficult to tell apart except by means of costly tests of large amounts can be analyzed under the microscope by means of colored films, according to a report by Professor A. M. Gaudin, of the Montana School of Mines, given at a joint meeting of the Canadian Institute of Mining and Metallurgy and the American Institute of Mining and Metallurgical Engineers. Importance is attached to this discovery because of the fact that similar-appearing ores may be widely apart in value. Differences in the color of the iridescent films are caused by differences in the thickness of the film. Minerals which otherwise have similar properties pick up differing amounts of film when placed in the same solution. The different colors, and therefore the different minerals, can be told at a glance.

DEATH VALLEY has more life in it than its name or traditional reputation might admit. A newly completed, detailed survey of the mammals of the below-sea-level portion of the valley, by Dr. Joseph Grinnell, of the University of California, shows that it is inhabited by a mammalian fauna comprising not less than twenty-six species, ranging from men to mice. As one "native mammal" is listed *Homo sapiens americanus*, the American Indian. As neighbors he has one species each of bighorn, wildcat, coyote, kit fox and badger, fourteen species of rodents and six species of bats.

FOG, shipping's deadliest enemy, appears one step nearer defeat with the announcement of successful heavy weather signaling by means of the Hayes radiometer. Tests have proved the practicability of the radiometer, originally invented as an extremely sensitive device for measuring heat radiation, its inventor, Hammond V. Hayes, of Boston, reports in the September issue of the *Review of Scientific Instruments*. The instrument makes practical the long hoped-for means of signaling by use of heat radiation instead of light. Heat rays penetrate foggy and thick atmosphere much more strongly than does light. Boston harbor during the last winter was the trial ground for the radiometer, which is being improved as a result of the first experiments. Signals were sent successfully a distance of more than a mile and a half on days when visibility was so poor that objects situated much nearer than the heat source could not be picked out.

GAR WOOD has been granted a patent on a new type of boat claimed to be faster than the conventional kind. This boat will literally ride on a layer of compressed air as it cuts along the water's surface. Skin friction between the boat and the water, the biggest single factor slowing down present-day speedboats, is expected to be substantially cut by the new design, a radical departure from standard motorboat lines. Whether the invention is to be used in a new assault on the motorboat record, set at 126.325 miles per hour by Sir Malcolm Campbell and previously at 124.86 miles per hour by Wood, could not be immediately learned. The speedboat has a tunnel the entire length of the hull built into its bottom. Ribs form air channels parallel to the tunnel. Air is forced into the channels by blowers geared to the engines. The air pushes the water away, preventing it from contacting the tops of the channels. The tunnel is so deep that when the boat is speeding through the water, the water does not touch its top. The unusual design results in the boat actually traveling on a cushion of air when going at top speed. The new boat is of the "tractor" type, with its propeller in the bow of the boat instead of at the stern.

CAVE floors, containing no less than three layers of Indian remains, have been excavated near Billings, Mont., by Professor H. Melville Sayre, president of the Montana Society of Natural History. The finds, which reveal Indian cave tenants of prehistoric days, take on additional importance, since Montana has been little explored archeologically. In the first level, Professor Sayre found Indian beds of grass, leaves, vines and sagebrush. Other levels contained fireplaces, household utensils of bone and stone, bones of animals, buckskin thongs braided with fiber and shells from the Pacific coast. Fragments of hematite, source of red paint, indicate that braves of these cavern apartments probably wore startling war paint or ceremonial decorations, even as later Indians did.