SCIENCE NEWS

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SOME REPORTS OF PAPERS READ AT THE RECENT MEETING OF ANATOMISTS

ISOLATION of an important constituent of the living substance, protoplasm, was reported to the meetings of the American Association of Anatomists held in Pittsburgh recently. This report was made by Dr. R. R. Bensley, of the University of Chicago. Living tissue was killed, frozen and dried, then subjected to extraction in salt solution and other chemical treatments. The material produced is jelly-like in appearance and consistency, and under the microscope looks like the connective tissue found beneath the skin, except that there are no cell structures in it. Dr. Bensley has named it Plasmosin.

THE human leg as a problem in mechanical engineering was presented before the meetings by Professor Herbert Elftman, of Columbia University. Professor Elftman has devised apparatus for studying the action of the various parts of our propelling machinery as the testing machines at the Bureau of Standards or in engineering colleges study the performance of electric motors or gasoline engines. Motion pictures taken at the same time as the tests make the mechanical records easier to understand.

THE brain has a definite "heat center" that responds to heating by speeding up breathing, starting perspiration, and initiating other physiological means for cooling off the body. Its existence and location were demonstrated to the anatomists by Dr. H. W. Magoun, of the Medical School of Northwestern University. In the experiments, Dr. Magoun applied electrical warmth to various parts of the brain of an anesthetized cat. When respiration speeded up, and the toe-pads showed signs of sweating, that was taken as an indication of stimulation of the heat center. This region that responds to rise in temperature lies on the underside of the front part of the brain, and partly on the underside of the midbrain. Normally, Dr. Magoun supposes, this heat center receives its stimulus from increased temperature of the blood. Heated environment warms the body, which in turn warms the blood, and when circulation carries it to the brain its increased temperature triggers the cooling-off reactions of sweating and faster breathing.

COLCHICINE, the growth-checking drug that has been used lately in a new method for controlling evolutionary development in plants, also has a powerful retarding effect on the growth of animal cells. It was used in checking the growth of one type of cancer in mice, according to Professor Alfred M. Lucas, of the Iowa State College. "Repeated treatment causes a primary regression (nearly complete) of the tumor, but some cells which are probably resistant remain. Test animals live longer than controls." The same drug was used on two-day-old chick embryos by Dr. George H. Paff, of the Long Island College of Medicine. It produced various abnormalities and retardations of growth.

FOUR ears, growing where normally only two would grow, was reported by Professor Ross G. Harrison, of Yale University, newly elected chairman of the National Research Council in Washington, D. C. Professor Harrison obtained his results through tissue-grafting experiments with early embryonic stages of salamanders. A part of the side of the head region was removed, and a piece of tissue from the abdominal region set into its place. Organ-forming influences from surrounding head tissues would cause the development of small but otherwise normal internal ear structures in this transplanted piece. If the head tissue that would normally form ears was removed in the operation, the only ears that developed were in the transplanted abdominal tissue. But if the head's own ear-forming region was left in place alongside of the transplant, then both transplant and normal head tissue form pairs of ears, so that the animal would finally develop with both pairs.—FRANK THONE.

DRUGS OF THE SULFANILAMIDE FAMILY

CONQUEST of influenza may be the next victory that will be chalked up to the credit of sulfanilamide, widely used chemical remedy that is already known for speeding recoveries from blood poisoning (septicemia), gonorrhea, gangrene, peritonitis, septic sore throat and other infectious ailments. This appeared from the report, given before the Dallas Meeting of the American Chemical Society, by Dr. M. L. Crossley, research director of the Calco Chemical Company.

Advising caution against translating immediately findings with animals into human benefits, Dr. Crossley nevertheless reported that a newly-prepared chemical relative of sulfanilamide showed "marked protective action against experimental influenza in mice. Should this compound," he declared, "prove effective for human use against influenza, it would mean that mankind at least has a weapon against a scourge such as the world-wide epidemic of influenza which occurred in 1918."

The new compound is 2,5-bis sulfanilamidobenzene sulfonic acid. It is considered the most promising of a number of new sulfanilamide compounds described by Dr. Crossley, because it appears to give 100 per cent. protection again streptococcus infections in mice as well as showing protective action against influenza in mice. "While sulfanilamide has been demonstrated to be a very valuable drug in medicine, it is far from being all-sufficient and the aim of investigators in both chemical and medical research is to find new compounds which will be more effective and less toxic than sulfanilamide," said Dr. Crossley, in presenting his report with Drs. E. H. Northey and M. E. Hultquist.

Dr. Crossley described new types of drugs of the sulfanilamide family which, in tests on experimental mice, have only one tenth the toxicity of regular sulfanilamide and from 5 to 6 times the potency. Ten times the amount of these drugs may be used with only the same toxic

effect, and the amount administered is many times as potent in killing infectious disease organisms.

The new improvements in sulfanilamide drugs consists of linking two or more sulfanilamide molecules into larger molecules. Several of the drugs described by Dr. Crossley consist of two sulfanilamide molecules linked together into a dumbbell-shaped larger molecule. One can think of these new drugs, Dr. Crossley indicated, as being derived from the parent sulfanilamide possessing attributes of the parent but having, in addition, some new, acquired characteristics. While sulfanilamide has been effective in treating bacterial infections, some of the newer drugs, derived chemically from it, appear also to have usefulness in combatting the virus diseases.—ROBERT D. POTTER.

THE AMERICAN POTASH INDUSTRY

How a dry lake bed in a California desert, and a mine in New Mexico where men work beneath an overlying blanket of water, have made the potash industry possible, was described at a special symposium at the meeting of the American Chemical Society.

Prior to the World War, Germany, with its great potash deposits at Stassfurt, monopolized the world's potash trade. These Stassfurt deposits, formed in prehistoric times by the evaporation of sea water which then covered the spot, have an origin comparable with the dry, desert-bounded Searles Lake at Trona, California. By drilling wells into the dry lake a strong brine is encountered which contains over 35 per cent. dissolved chemicals, said W. A. Gale, chemist of the American Potash and Chemical Corporation at Trona. The brine is rich in the salts of potassium and sodium and the separation of the various fractions by evaporation is one of the triumphs of American chemistry. The prior work in Germany was of little use in developing the present processes. The physical difficulty of founding a town of 1,800 workers in a desert region was no small feat in itself. The Searles Lake deposit at Trona furnished 40 per cent. of America's potash needs last year, according to R. W. Mumford, of the same company, another speaker on the program.

As auxiliary products the salt brine produces 40 per cent. of the world's consumption of borax and boric acid, together with substantial amounts of soda ash and salt cake. In the California brine wells the potassium chloride is obtained only after evaporation processes. In the New Mexico deposits, near Carlsbad, the potassium chloride is mined in operations which, in some ways, are a race against time. The urgency arises because the potassium chloride deposits lie beneath layers of water-bearing sand and gravel. If that water enters the potash mine, the operations will be abandoned because the potassium chloride is highly soluble in water. "Should water enter the mine through caving," said R. M. Magraw, of the Potash Company of America, "the damage will be to a property that would be exhausted in any event if no effort were made towards ultimate recovery."

The Carlsbad mine is worked at the 1,000-foot level, consisting of salt and other solutions immediately above the bed. The top 400 feet consist of porous water-bearing limestone, shales and clays. In sinking the mine shaft water was often encountered. In one case the flow was 1,000 gallons a minute. These leaks were stopped and the shaft lined with concrete to stay, permanently, the flow. Water pressure of 84 pounds to the square inch now exist behind the concrete walls.

Below all this water miners do their work, using mechanical techniques as much as possible. Large amounts of explosives are employed because of the toughness of the ore. Room and pillar mining is employed with the pillars still in place. Eventually the pillars may be "pulled," said Mr. Magraw, when the deposits have been completely exploited. But, until that time, they will remain untouched because of the danger of bringing down the overlying water-bearing deposits and, hence, ruining the valuable potash.—ROBERT D. POTTER.

ITEMS

HOT RIVER, draining Mammoth Hot Springs, thermal region in Yellowstone, carries away radioactive materials equivalent to 40 grams of radium a year (worth about $800,000 if extracted), according to Drs. Herman Schlundt and Gerald F. Breckenridge, of the University of Missouri. Draining the deeply buried rocks of some of their heat-producing radium content, these hot spring waters of unknown origin do not contain much radium per quart, but over a year's time the amount of radon, a radium by-product, removed, is very great. Other hot springs, outside Yellowstone Park, also contain radium, suggesting that chemical changes deep in the earth are substantially the same wherever hot springs occur.

MILLIONS of tons of spodumene, ore of feather-like, silvery lithium, lightest metal known, have been located in North Carolina, near Kings Mountain, of Revolutionary War fame, since the first discovery of the crystalline white mineral by Frank Hess, U. S. Bureau of Mines geologist, in 1936. Hundreds of thousands of tons stick up above the ground, where they can be cheaply quarried, and more lies near the surface, reports Herman J. Bryson, state geologist of North Carolina. These deposits are the largest known in the world, far exceeding the famous beds at the Etta Tin Mine, in the Black Hills of South Dakota, where single spodumene crystals 40 feet in length, weighing 80,000 pounds, have been mined. Lithium is used as a hardener in lead and aluminum alloys and in various medicines. Its compounds are used in pottery and glass manufacture, storage battery electrolytes, photographic processes, as a coloring agent in signal flares, and in several chemical processes.

A BIRD refuge, comprising some 57,000 acres, has been established in the marshy delta of the Volga River. Here, vast stretches of wetland vegetation offer shelter to tens of thousands of birds, including geese, ducks, cormorants, pelicans, herons, egrets, gulls, terns and other waterfowl, as well as many species of songbirds, owls, hawks, etc. Mammals are comparatively rare, and there are not many reptiles. The region offers unusual opportunities for the scientific study of birds, and an ornithological research station is part of the regular establishment. Great numbers of birds have been captured, banded and released.