SCIENCE NEWS

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SOME PAPERS READ AT THE ROCHESTER MEETING OF THE AMERICAN CHEMICAL SOCIETY

FIRST heavy hydrogen; then heavy water; now heavy nitrogen. That is the thumbnail research summary of the work of Professor Harold C. Urey, of Columbia University, who has already received the 1934 Nobel prize in chemistry for his investigations in the intricate field of chemical isotopes. Heavy nitrogen, the latest chapter in this scientific program, has now been separated in quantities sufficient for chemists to use it as a "tracer" in chemical experiments. This was announced on the eve of the opening of the meeting of the American Chemical Society which brought more than 3,000 scientists to Rochester. After two years of intensive research Dr. Urey and his colleagues, Dr. John R. Huffman, H. G. Thode and Marvin Fox, have so perfected their apparatus for producing heavy nitrogen that they can produce two tenths of a gram of the precious heavy isotope of nitrogen every 24 hours. An isotope is a variety of an element which is chemically identical with the usual form, but which has a slightly different weight. In physiology heavy water molecules—composed of oxygen and hydrogen atoms in the form of a heavy hydrogen isotope—have already been used to learn how long the water is retained by the body. English experiments have shown that about 50 per cent. of the water molecules, drunk at any time, may be retained in the body for days. Similarly the atoms of the new heavy nitrogen isotope can also be used as tracers. Investigators from the Columbia University School of Medicine, under the direction of Assistant Professor Rudolf Schoenheimer, reported that the heavy nitrogen helps to establish the fact that absorption of hippuric acid, or benzoylglycerine, is possible directly through the intestinal walls of the body. This knowledge helps to answer one question on the little understood matter of the body's chemical disposal of a waste product. The new heavy isotope of nitrogen has an atomic weight of 15 instead of atomic weight 14 for the normal kind. Only one nitrogen atom in every 263 is of the heavy variety. The original discovery of the heavy nitrogen isotope was made in 1929 by S. M. Naude, of the University of Chicago. Thus, it has taken some eight years to attain the present production, even though it may seem, at first glance, to be a very small quantity.

HIGH-SCHOOL chemistry books and courses should be revised to increase instruction on how to prevent and treat injuries of a chemical nature, according to Dr. J. O. Frank, head of the Department of Chemistry of the Wisconsin State Teachers College. More than 7,000 accidental deaths which occurred in the United States involved chemicals or showed a fatal lack of chemical knowledge. About 40,000 chemical accidents which did not end fatally occurred during that year. More than 1,600 of the accidents involved death from poisonous gases, of which carbon monoxide, present in the exhaust from automobiles and in illuminating gas, was most frequently the death-dealing agent. Acute accidental poisoning from other causes besides gas caused another 1,400 deaths. Food poisoning sent more than 700 persons to untimely graves, while accidental burns, aside from fires, accounted for nearly half the total of 7,000 reported. Many of these deaths might have been prevented and many of the accidents might never have taken place were adequate knowledge of what not to do with chemical substances and of what to do in an emergency possessed by the man in the street. Ten standard high school texts were rated by Dr. Frank on the adequacy of their content with regard to handling chemicals and treating accident victims. No one of them rated more than 50 per cent. in his estimation.

"LIKE water off a duck's back" has lost its ancient significance. For a new substance, trade-marked "tergitol," will make water "wetter than wet" and will guarantee wetting the most obstreperous materials. The product is believed of immense value to industries such as textiles which have in the past had difficulty securing uniform wetting of materials, required in various processes. Cotton fibers have been known to float on the surface of water for days without being thoroughly wet. Soap has been used in the past for this purpose, but its application is limited to soft waters that are not acid. The new product, a synthetic alcohol, is claimed to be five times more efficient than soap in soft water and to retain its effectiveness even in acid or hard water. Improved results and reduced time are claimed for the new wetting agent in several industrial processes.

RED SPIDER, a pest to the rose fancier and a menace to the professional flower grower, can be controlled effectively by a new derivative of the chemical cyclohexylamine, according to a report by T. S. Carswell and H. L. Morrill, of the Monsanto Chemical Company. Cyclohexylamine, which has been known in the laboratory since 1893, is now being produced commercially in the United States. Destructive influence of the pest, which attacks a wide variety of hothouse plants as well as roses, is particularly felt in the greenhouse, where a single bench of roses frequently represents an investment of $20,000.

SMALL boys' boxing and wrestling idols probably owe their strength as much to the high vitamin content of fresh, frozen or canned spinach as they do to its reputed high iron content. Studies of the vitamin content of the vegetable with the famous dark green taste show that its vitamin content equals that of oranges and other citrus fruits and surpasses that of most other fruits and vegetables. Tests conducted by C. R. Fellers, D. DeFelice and C. F. Dunker, of the Massachusetts Agricultural Experiment Station, were the basis for the analysis of spinach. Some of the vitamin C, which prevents scurvy and which spinach contains plentifully, is lost during the cleaning process that precedes the freezing or canning of

spinach, but enough is retained so that "it can be called a very good source of vitamin C." Vitamin A, which is closely connected with growth and is known to prevent night blindness, is also to be found in relatively large quantities in the vegetable. Dried spinach, however, it was stated, loses practically all its vitamin content and is not a satisfactory vitamin source.

THAT temperatures close to absolute zero, a point 459 degrees below zero Fahrenheit, and the theoretical low limit of cold, will be obtained by means of a powerful electromagnet was described by Dr. Francis Bitter, of the Westinghouse Electric and Mfg. Co. The magnet will be used to restrain the motions of atoms magnetically. This will produce cold close to the absolute zero limit because of the fact that heat is nothing more than motion by the molecules. At absolute zero molecules and atoms have practically stopped vibrating. Magnetic restraint of the atoms can thus be used to achieve extremely low temperatures more easily than by liquefaction of helium.

DR. HOWARD ADLER and George Klein, of the Victor Chemical Works, reported that traces of fluorine compounds, found in drinking water in the Midwest and responsible for the mottled coloring of children's teeth, can be removed by use of a chemical, tri-calcium phosphate. Tri-calcium phosphate, dried to a powder from a watery gelatin, absorbs fluorine compounds readily. Ten pounds of the substance will remove sufficient fluorine from 560 gallons of water to render the small impurity harmless.—ROBERT D. POTTER.

SOME PAPERS READ BEFORE THE NOTTINGHAM MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

WILD rabbits have few friends in England. They destroy vast quantities of farm and garden crops and trees, their food value is low, they are likely to be diseased. But hatters prize them because their hair makes the best felt. And furriers have a kindly spot in their hearts for them, too, now-a-days. Captain C. W. Hume, of London, summed up the pros and cons for the wild rabbit of Britain. The cycle in rabbit population, which has been observed in the United States and Canada as well as Europe, is a real thing Captain Hume said. But the commonly assigned causes for fluctuations in rabbit population don't seem to work. Abundance is not closely related to rainfall, coming indifferently after dry or wet years. If history repeats itself the rabbit population of Britain is likely to fall temporarily in the near future, rising subsequently until it reaches a new high in 1943 or 1944, if coordinated efforts to control the increase are not made.

FAR from England and remote from rabbits is another class of animals, the copepods of the Antarctic. Yet they have a meaning for life in England, for they are the ultimate food of several species of commercially important whales. Dr. F. D. Ommaney, who has studied these little cousins of the lobster in their native waters, told of their comings and goings. Every summer the countless individuals of these species come up into water less than 300 feet deep, to spawn. The new generation slowly sinks down into layers below 750 feet deep. The older they grow, the deeper they go. They rest all winter, growing but little. Then in the spring they start back toward the surface, to repeat the life cycle.

MRS. K. GRANT stated that hawk moths, those whirring insects which many people mistake for humming-birds, have cycles of abundance and scarcity no less than larger animals. She has studied these insects in the United States as well as in Great Britain, in records covering 130 years in Britain and 60 years in America. "There seems to be some correlation between outbreaks and the sun-spot cycle," she said, "but the figures are barely significant. The outbreaks tend to occur away from the sun-spot minima."

PARENTS generally are proud and pleased when their offspring begin to run around the house, exploring, handling things. They even manage to be patient when little Precious pulls a corner of the tablecloth, precipitating ruin. But they are apt to become wearied and exasperated a little later, when the endless torrent of "Why?" begins to flow. Dr. M. M. Lewis pointed out that the child's questions are just a means of orienting the youngster's life in a new and strange world. They serve two purposes; they are first play, then a social instrument, a means by which the child attempts to satisfy his needs. Children's questions pass through three stages: At first they are a means of dealing with the present situation, the one in which the child finds himself at the moment. Then they begin to deal with absent situations, either past or future. Finally they come to refer to merely possible situations. They are like the "hypothetical questions" of a lawyer. The child asks them to satisfy his curiosity. At first he uses them chiefly to check up on things he already knows. Then he makes them instruments for adding to his knowledge.

HEARING and feeling are regarded as quite distinct senses in ourselves and other higher vertebrates; but this was not always so, in the opinion of Dr. R. J. Pumphrey. They evolved out of the same sensory set-up, and the primitive form of perception was more akin to what we call feeling. Dr. Pumphrey differentiated between "displacement receptors," which translate actual movement of molecules, like air in sound-waves, into messages for the brain, and "pressure receptors," which take account of things that change position against the body and they "stay put." In the latter class are the nerve-and-tissue complexes that "feel."

J. W. S. PRINGLE stated that insects do not have the same kinds of organs of movement and position as other animals possess. We and the other higher vertebrates know where our arms and legs are by the "feel" we get from muscle position. In insects, similar knowledge of limb position is gained through hairs on the leg joints, which are bent in varying degree as the insect moves.

ITEMS

THAT the infantile paralysis epidemic continues unabated, is shown by reports to the U. S. Public Health Service. For the week ending August 28, there were 621 new cases reported throughout the country. For the previous week the total was 492, while for the corresponding week last year there were only 164 cases. While no one can tell when the epidemic will be over, a chart in the offices of the U. S. Public Health Service showing the median or normal prevalence of the disease indicates that the number of cases is usually high for the first three weeks of September each year and then drops. The epidemic is now centered in the Middle West, although New York State and Massachusetts reported large numbers of new cases during the last week of August. In Texas, where the epidemic apparently started, the number of cases dropped from 51 for the week ending August 21 to 34 the week ending August 28. States showing large increases for the week ending August 28 are: New York, with 64 cases against 39 the previous week; Ohio, with 50 against 22; Missouri, with 29 against 13; Oklahoma, with 25 against 19; Michigan, with 31 against 21; Colorado, with 28 against 21, and Nebraska, with 19 against 15.

DISEASE fighters of the Federal Government have gone into action to protect the United States from cholera which is raging in the Orient as accompaniment of the Chinese-Japanese war. Dr. H. F. Smith, chief quarantine officer of the U. S. Public Health Service's quarantine station at Manila, P. I., has been ordered to Hong Kong to take personal charge of the situation as it may concern the United States and to assist local health authorities in controlling the disease. A cabled report from Dr. Smith states there have been 802 cases of cholera, with 427 deaths, in the Hong Kong area up to August 24. All ships bound for the United States from the Orient have been told to stop at Honolulu for quarantine inspection if there is any unusual illness aboard. These ships are also being advised to have competent physicians and medical officers aboard to handle any cases that may occur during the voyage. All U. S. west coast quarantine stations have been notified to be on the alert to detect promptly any cases or carriers of cholera.

WHERE the most ancient men known to science lived, loved, worked and fought, Japanese and Chinese soldiers are now using the most modern methods of killing each other. Reports from the Peiping area indicate that the famous archeological sites near Chou-kou-tien are well within the battle zone. Here have been unearthed from caves the bones of Sinanthropus, the Peking Man, who lived perhaps half a million years ago and who is considered to be perhaps the most ancient true ancestor of modern man. Chou-kou-tien is only 45 miles from Peiping on a branch of the Peiping-Hankow Railway. Scientists here are concerned that the present fighting will endanger the collections and studies of the geologists and anthropologists engaged in studying Peiping Man, as well as other scientific work in the Peiping area.

A NEW and promising weapon against asthma, bronchitis, other chest diseases, and sinus trouble, is now being given its first American trial. Because of medical ethics, American physicians who are using the new treatment—a combination of air conditioning and air medication—refuse to talk about it until they have had time to report their results to medical societies and journals. No names of patients, physicians or institutions can be divulged. The treatment is given by a special apparatus devised by an American chemist, David Fingard, and his uncle, J. J. Duke. The latter was himself an asthma sufferer. Looking something like a radio cabinet, the apparatus filters, warms and dries the outside air and adds to it a carefully blended mixture of iodine, creosote, carbolic acid, essential oils and other aromatic substances. Glycerine and oil of garlic, the latter long a favorite throat-soothing substance with singers, are in the mixture. Some of these chemicals have a soothing action on tissues and others are known germ-killers.

A NEW factor which belongs to the vitamin B complex and which is needed for the nutrition of animals was recently announced by C. A. Elvehjem, C. J. Koehn and J. J. Oleson, of the University of Wisconsin, working in cooperation with the Wisconsin Alumni Research Foundation. In the isolation of the factor certain discarded fractions of the liver which have been used in preparing vitamin B-2 and flavin, were precipitated with a mixture of alcohol and ether, and when tested were found to be highly active in the new factor. Further purification and concentration have been brought about by means of solvents and precipitation. The factor is readily soluble in water, but not in acetone. It is absorbed on charcoal at neutral pH. It is readily destroyed by heat in autoclaving. No extensive study has been made on the distribution of the factor, but it has been found in considerable quantities in yeast and fresh milk. Cereal grains seem to be very deficient in it. In view of the fact that the factor may be found to have considerable importance in animal nutrition, an intensive investigation of the rôle it plays will be undertaken. It has not as yet been named.

THREE methods of regulating the flow of streams, important element in flood control, were outlined by Robert E. Horton, consulting hydraulic engineer of Voorheesville, N. Y., at the Denver meeting of the American Association for the Advancement of Science. They are respectively—surface storage in reservoirs, forestation and what Mr. Horton calls infiltration. To this third method he devoted special attention. Infiltration is essentially "soaking in" of rain as it falls—something much desired by farmers for the sake of the crops. But infiltration goes on down, so that it is of little direct benefit to agriculture, except in so far as it spares the soil from erosion. But it does store water in the ground, and by letting it out gradually is of great value as a stream-level governor. By increasing a certain prairie soil's infiltration capacity from three tenths to six tenths of an inch per hour, the ratio of ground-water flow to runoff from the surface was increased from about 27 per cent. to 70 per cent., with corresponding advantage in regularity of stream flow.