SCIENCE NEWS

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PAPERS AT THE TULSA MEETING OF THE AMERICAN CHEMICAL SOCIETY

FOR the first time in its history, the members of the American Chemical Society were told on April 6 of the discovery of a new element, one of the building blocks of the universe, by one of their fellow members. Professor B. S. Hopkins, of the University of Illinois, told of his work in collaboration with J. Allen Harris and L. F. Yntema, which recently resulted in Illinium, element No. 61 in the list of the elements, the first to be discovered in the United States. Their work leaves but two more elements to be discovered. The element was obtained from monazite, a material used in the manufacture of gas mantles, but it was necessary to repeatedly dissolve and crystallize it to get the portions in which the new element was found. Finally, by photographs made with the aid of X-rays, spectral bands were obtained which correspond to the missing element, for many of its properties were known long before its discovery. The wave lengths of the lines on the plate were within four twenty-five billionths of an inch of those calculated in advance, said Professor Hopkins, and though they were faint, their presence was verified by a number of disinterested observers. Doubtful plates were rejected.

THE idea held by many people that vitamins in vegetables are harmed by cooking was attacked by E. F. Kohman, of Washington, D. C., speaking before the annual meeting of the American Chemical Society. Vitamin C, the one which prevents scurvy, has been most commonly supposed to be injured by cooking, but vitamin A, which insures normal growth, has also been included in the list, Mr. Kohman told his hearers. The damage was supposed to result from the combination of the vitamin with oxygen from the air at the high temperatures of cooking; but in tests which he conducted Mr. Kohman was unable to confirm these suppositions. "The only experimental evidence in the literature that vitamin A is destroyed by oxidation is in connection with fats when they are directly exposed to air in shallow layers while being heated," said Mr. Kohman. "This condition is scarcely ever met with in the handling of foods. There is an abundance of evidence that vitamin A is not destroyed by oxidation in the general handling of foods. Live steam has been passed through butter fat for six hours with no loss of vitamin A. Steenbock and Boutwell heated yellow maize, chard, carrots, sweet potatoes, squash and alfalfa under pressure for three hours at 248 degrees Fahrenheit, with no loss of vitamin A being evident. This is a more severe temperature than any canned foods are ever subjected to. We have doubled the process of canned peas from twenty-five to fifty minutes at the same temperature without any loss of vitamin A being made evident under either condition. It is possible that vitamin A might be destroyed under these conditions of heating foods if oxygen were actually bubbled through them. But within the conditions of handling foods it may safely be stated that vitamin A is not oxidized."

VITAMIN D, the substance in milk that prevents rickets, a disease of the bones, is increased when the milk is exposed to ultra-violet light, invisible rays given off by the sun and some mercury vapor arc lamps. However, it is not likely that dairies will begin to use ultra-violet light on their products, for vitamin A, the substance that insures normal growth, is destroyed by the same process. Professor J. S. Hughes, of the Kansas State Agricultural College, told members of the American Chemical Society of his work in collaboration with R. W. Titus and J. B. Fitch on this subject. In their experiments one set of chicks was fed with milk that had been exposed to ultra-violet light, while a second group was fed with untreated milk. The latter developed normally, but the first group developed conditions typical of the lack of vitamin A, Professor Hughes stated.

COTTON as a fabric material is a commonplace of every one's daily life, but most people seldom think of the important part cotton, as a chemical, plays in their ordinary activities. G. J. Esselen, Jr., of Boston, pointed out the magnitude of cotton's share in American chemical industries. Nearly 190,000 bales were used during 1925, he told his hearers, in the manufacture of such diversified products as rayon or synthetic silk, celluloid, photographic films, automobile finishes and similar lacquers, artificial leather, paper and explosives such as smokeless powder and dynamite.

THE cotton plant is a veritable mineral mine, under the hands of a chemist, according to Dr. J. S. McHargue, of the Kentucky Agricultural Experiment Station. In addition to iron, phosphorus, magnesium, calcium, potassium and sodium, metallic elements commonly found in plants and considered essential parts of them, Dr. McHargue found copper, manganese and zinc. He found the copper and zinc in greatest concentration in the kernel of the cotton seed, and suggests that these elements play a vital part, as yet unknown, in the economy of the plant.

THE production of a refined and delicate perfume from ill-smelling petroleum was demonstrated to-day by Harold S. Davis, of the Arthur D. Little corporation. Recent investigations in this field indicate that the use of petroleum as a source of raw material for the synthesis of complex carbon compounds may in time transcend its importance as a fuel. Various alcohols may be made from crude mineral oils, none of which will interfere with the Volstead Act, but some of which have recently come into common use as solvents for lacquers and the like. Among these alcohols that may be made from petroleum, that known to chemists as "tertiary butanol" is of particular interest and promise for industrial use as a consequence of certain unique chemical and physical properties, such as serving as the basic material of a synthetic scent.

How synthetic fuels for internal combustion engines may be made from coal and water was described by C. R. Hoover, of Connecticut Wesleyan University, and associate investigators. The material employed in the process is the familiar blue water gas, made by passing a current of steam over a bed of red hot coal. When this water-gas is conducted at high temperature and pressure over a catalyzer, such as finely divided nickel, copper, iron or other metal, the carbon in part combines with the hydrogen, giving a gaseous mixture that contains from twenty-five to thirty per cent. of compounds of higher heating value. By increasing the pressure of the process it is possible to obtain compounds containing oxygen as well as hydrogen and carbon, such as alcohols and aldehydes of various kinds, some of which may prove on further investigation to have commercial possibilities.

MEASLES PREVENTIVE AND CURE NOW ASSURED

Measles may become one of the preventable diseases in the very near future. The latest of medical achievements bids fair to bring this epidemic disease of childhood under partial control at least.

The discovery of a streptococcus that causes measles by Dr. N. S. Ferry and L. W. Fisher, of Detroit, has been announced by the American Medical Association. This organism produces a soluble toxin that can be used in the production of antitoxin on a large scale. This antitoxin, which consists of horse serum treated with the measles toxin, can be used in both preventive and curative treatment of measles.

The triumph of medical science over diphtheria and scarlet fever, both of which diseases are now capable of being controlled, was accomplished by similar steps and methods.

The new measles discovery is in accord with similar results obtained by Drs. G. F. and Gladys H. Dick, in Chicago, in 1924, in studies on scarlet fever. It appears, according to medical authorities, that in some of their many forms streptococci are accountable for a variety of diseases, besides being able to induce general blood poisoning.

Blood serum from convalescent measles patients has been in current use with some degree of success as a means of prevention with children that have already been exposed.

Now schools should not be closed when measles are prevalent, according to Dr. Victor C. Vaughan, chairman of the division of medical science of the National Research Council, whose son, Dr. Henry F. Vaughan, health commissioner of Detroit, has been concerned in the research on measles toxin. Every child, he said, should be inspected daily because a skilled physician is able in the majority of instances to detect this disease in the pre-eruptive stage. When this is done the child should be sent home and put to bed and exposed children should be treated with the convalescent serum.

Uncomplicated measles is not highly fatal but it predisposes to virulent pneumonia. One attack of measles gives lasting immunity while adults who have not had the disease are quite as susceptible as children. The younger the child, however, the more fatal is the disease, the death rate being highest among those under one year of age.

THE ANTI-EVOLUTION LAW IN TENNESSEE

Tennessee's anti-evolution law after being in force for nearly a year has had a serious effect upon the schools of the state, according to Judge John R. Neal, member of the counsel who last summer defended John T. Scopes at the celebrated Dayton trial. The appeal of the verdict against Mr. Scopes on the grounds of the alleged unconstitutionality of the law is still pending before the Tennessee Supreme Court, and will probably be heard in May.

Judge Neal made the following statement through Science Service:

"The appalling effect of the anti-evolution law in Tennessee is written in the anxious faces of every science teacher in the high schools, and the state university. At least to these individuals it has ceased to be a joke and become a terrifying reality, for the following reasons:

"In the first place, immediately after the passage of the law, the text-book commission of the state, of which the governor is the head, either deleted the science text-books of all reference to evolution or selected new science books of an inferior character because they contained no reference to evolution. The teachers were informed that unless they made sole use of these inferior text-books they would be dismissed and prosecuted under the anti-evolution law.

"Second, I have been informed by numerous science teachers that almost every recitation has become a trying ordeal on account of the necessity of avoiding the questions either asked innocently or designedly by the students the proper answer to which would lead to a discussion of evolution.

"Thirdly, the public announcement of boards of education and superintendents of public instruction that no teachers of science will be employed or retained who do not satisfy them that they will not only not teach evolution but that they do not believe in evolution. As a result many timid teachers are becoming fearful of discussing scientific subjects even in private conversations.

"An ominous silence continues to brood over the university. The president of the university and the administrative authorities refuse to answer queries of newspapers as to whether the anti-evolution law has necessitated changes in text-books and methods of teaching science. They evidently appreciate the danger involved in frankly answering this question. If they should say yes they realize they would receive the contempt and ridicule of the scientific world; if they say no, they subject themselves to criminal prosecution. Discontent and dissatisfaction among the student body however is becoming more apparent every day. The intelligent and ambitious student who desires later to pursue professional courses in the larger Eastern and Northern universities is becoming apprehensive that his credits in science will not be accepted by these institutions.

"There is absolutely no possibility of the repeal of

the anti-evolution law by the next legislature unless public opinion is enormously changed. The present governor, who approved the bill and who is a candidate for reelection, has announced as part of his platform that he will veto any effort to repeal the law. His only antagonist claims to be the real author of the bill.

"The press of the state as a whole have given no assistance whatever to those who have led the fight against the bill.

"The sole hope of any immediate relief lies in the possibility of securing in the Scopes case a decision of the Supreme Court of Tennessee to the effect that the act is unconstitutional."

AMERICA'S NATIONAL PARKS

THE project for stressing the educational value of the American national park system, making it into a vast super-university of the out-of-doors, in which any thoughtful person may study, regardless of age or previous educational qualifications, will be discussed in an announcement of the National Park Association which will be issued in a few days.

The leading article in the number will be by Dr. John C. Merriam, president of the Carnegie Institution of Washington. After discussing the recreational side of national park activities, which is already well developed, Dr. Merriam will say, in part:

"As I have given something more than forty years to study of special problems such as the parks interpret, and have lived thirty of those years among the parks, I have some confidence in saying that for many purposes their purely educational value is far beyond that of any regularly established, formal educational institutions. Among the most important features are those which concern the nature of the earth—the manner of its building—the forces which have come into play—the meaning of the almost limitless history of earth-making as it is pictured before us. David said, in viewing the works of nature, 'The heavens declare the glory of God, and the firmament showeth his handiwork.' This work of the Creator's hand presents itself here in such a way that all may comprehend. Here is found also much that represents the unmodified primitive life of the world, both plant and animal, remaining just as the Creator moulded it over the mountains and valleys. Nature is said to be an open book to those who really wish to read it, but there are grades and shades of meaning which may be hard to understand. There is certainly no place where the leaves are more widely spread or the print more clear than in these portions of the book.

"With all that has been done by geologists and other scientific men, by central administration of the government, and by officials concerned with immediate administration of national parks, we have only begun to convey the really great lessons to the multitude. Science needs itself to know more fully what the story is, and then simplification and clarification must help to carry the great essentials over, so that the casual visitor may read and may interpret without depending upon the word of another. To attain such clearness of expression is to stand upon the highest plane of education. For many objectives this level can nowhere be reached so easily as in the national parks. There are not in America other places where, for these purposes, comparable possibilities for effective adult education concerning nature can be found, with the grandest products of creation themselves as teachers. For utilization of this opportunity we need support adequate to prepare for most effective use. In such a super-university professors would be only guides and not instructors, but there should be a faculty chosen from leaders in thought and appreciation, a group of men who, standing in the vivid presence of the Creator, would serve to point out the road."

ITEMS

NAMES of faint stars that are companions to brighter objects are suggested by Sir Oliver Lodge, even though these stars are too faint to be seen except with the most powerful telescopes. "Eddington" is the name suggested for the companion of Sirius, the "Dog-Star," since it has been found by Professor A. S. Eddington, of Cambridge University, to be so dense that a single pint of it would weigh twenty-five tons. This has been confirmed by spectroscopic observations at the Mount Wilson Observatory in California. For the famous invisible star of Algol, the "Demon Star," Sir Oliver suggests "Vogel," after K. H. Vogel, the German astronomer who first proved its existence. This companion is dark and can not be seen with any telescope, but it makes its pressure known by periodically coming in front of the bright member of the pair and partly obscuring it.

CADMIUM plating is as effective in preserving iron and steel from corrosion as zinc, metallurgists at the U. S. Bureau of Standards find. Zinc plating or "electrogalvanizing" is especially valuable in commercial processes because it continues to act as a protection to the underlying iron or steel even when partially worn away. This is the result of an electro-chemical reaction between the base metal and the coating. The two in contact with a liquid such as a water solution of any chemical salt acts like a wet battery. Automobile parts subject to corrosion, such as rims, nuts and bolts, are common examples of electrogalvanized iron. Cadmium has been suggested for use in this way but it was not previously known just how it would react. The experiments carried out in the metallurgical division by H. S. Rawdon have demonstrated that it behaves in much the same way as zinc, with some advantages and some drawbacks. It is less readily attacked by air and moisture and in consequence stays bright longer than zinc. It could suitably replace nickel plating in many places and it would give much more lasting protection to the iron or steel base. Likewise a coating of cadmium will last longer than a coating of zinc of the same thickness. It has, however, the serious disadvantage of being expensive to prepare. It is possible that it may be made more cheaply if the demand is ever sufficient to stimulate large quantity production.