SCIENCE NEWS

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WELLESLEY COLLEGE MEETING OF THE AMERICAN ASTRONOMICAL SOCIETY

PRESERVATION of the framework, at least, for international cooperation among astronomers was urged by Dr. Robert G. Aitken, director emeritus of the Lick Observatory, in his address as retiring president of the American Astronomical Society.

"We must give thought," he said, "to the individual astronomers from war-torn countries who may find their way to this country; but this is part of a far larger problem involving the welfare of all professional men who are driven from home, and must be given over to some general organization like the American Association for the Advancement of Science, so far as scientific men are concerned. The astronomers will want to do their part generously, but particular care must be exercised that we do nothing to place in jeopardy the careers of the young astronomers trained in our own universities and observatories."

Giving full credit to the important work that can be done with telescopes like the 200-inch now being constructed, and even larger ones that may come in the future, Dr. Aitken emphasized that smaller star cameras, such as the Schmidt or Ross type, are needed for the solution of some of the most urgent present-day problems in astronomy, such as "the structure and rotation of the galaxy and the relation of our galaxy to others comprising the greater universe."

An important step in this direction was announced by Dr. Harlow Shapley, director of the Harvard College Observatory, who told the astronomers that a powerful Schmidt camera, larger than any now in use, is nearing completion at the Oak Ridge, Mass., station of his observatory. Erected in memory of Professor and Mrs. James R. Jewett, it is called the Jewett Memorial Telescope. The mounting, designed by Dr. George Z. Dimitroff, superintendent of the Oak Ridge station, was built in the observatory shops at Cambridge, and has now been placed. The glass parts, a concave mirror two feet across, and a correcting lens 33 inches in diameter that will be used in front of it, have been made by the Perkin-Elmer Corporation, and will be installed shortly. This telescope will be working in a month, he said, and will be used for counting stars and studying galaxies and variable stars.

Sun-spots, magnetic disturbances and northern lights they produce on the earth, have a bad effect on radio after they happen, but the transmission of wireless waves is particularly good for about a week before such outbursts, was stated by Dr. Harlan T. Stetson, of the Massachusetts Institute of Technology. Four days before the auroral display it is best.

Bad reception follows the aurora for about a week. It is worst two days after the aurora with broadcast waves, and at the same time for short waves used in transatlantic communication. Dr. Stetson attributed this effect to changes produced by the ultra-violet light of the sun in the ionizing layers which reflect long-distance radio waves back to earth again.

Most of Dr. Stetson's studies are made at Needham, Mass., where he records nightly the intensity of signals received from a broadcast station in Chicago. Such a distance is required so that waves will travel up to one of these reflecting layers, a hundred miles above ground, and be sent down again.

During the day, the station can not be received at all, but after sunset it begins, and gradually improves, as the sun descends farther below the horizon.—JAMES STOKLEY.

THE NEW VACCINE FOR MEASLES

SUCCESS in vaccinating a small group of children against measles, which often leads to pneumonia and serious ear trouble, has been achieved by Dr. Joseph Stokes, Jr., of the University of Pennsylvania Medical School, and Dr. Geoffrey Rake, of the Squibb Institute for Medical Research, New Brunswick, N. J.

Army officials as well as parents throughout the land will hail this promise of triumph over measles, which was announced at the University of Pennsylvania Bicentennial Conference.

During the last World War, it was pointed out, measles became one of the commonest causes of death in the Army. This was because thousands of country lads who had never had measles due to their relative degree of isolation during childhood contracted the disease after they got into Army training camps. Many of them not only had measles but a severe and often fatal pneumonia as a complication of the measles.

The new anti-measles vaccine was made by growing the measles virus or germ on fertile hen's eggs. Apparently the virus becomes weakened or attenuated while growing in this environment and when injected under the skin or placed within the nose it produces a very mild type of measles in some children and no symptoms at all in others.

Two groups of children in New Jersey and Philadelphia, with the permission of their parents and health authorities, gave the new measles vaccine its first trials. None of the children had had measles. One group was vaccinated and the other was not. Both groups were then given injections of measles virus from patients who had measles. The unvaccinated children came down with measles, but the vaccinated ones did not. This was most encouraging, but Dr. Stokes pointed out that the number of children in these trials of the vaccine was too small to be entirely sure of the value of the vaccine.

Permission to make the tests was readily given by parents as well as health authorities because neither group of children ran very much danger. In the first place, they were all likely to get measles at some time in their lives, since 98 out of every 100 children are susceptible to it. In the second place, the trials were made in spring, the season when measles is least likely to be followed by ear trouble, pneumonia or other complications. Besides this, the children all had the best medical and nursing care.

Production of large amounts of the vaccine, it is said, will not be difficult and it can be preserved for long periods.—JANE STAFFORD.

CANCER PREVENTION; VITAMIN K

VITAMIN K, the vitamin that is saving new-born babies and sick adults from bleeding to death, may be a help in preventing cancer.

Experiments to test this possibility are now under way, according to an announcement made by Dr. Louis F. Fieser, professor of chemistry at Harvard University, at the University of Pennsylvania Bicentennial Conference.

Vitamin K prevents bleeding in certain conditions because it favors production in the body of prothrombin, the blood constituent necessary to proper blood clotting. The chemical relationship between the vitamin and prothrombin, Dr. Fieser said, is similar in certain ways to a detoxifying of cancer-causing chemicals that has been observed in laboratory animals. "On the hypothesis that a cancer-producing hydrocarbon can be detoxified by interaction with suitable disulfide compounds it is conceivable that one of the normal functions of prothrombin may consist in the protection of the body from incidental carcinogens (cancer-causers). This would suggest the possibility that maintenance of prothrombin at the top level of activity by administration of vitamin K may produce a condition favorable to the inhibition of hydrocarbon carcinogenesis, and experiments to test this point are in progress."

The cancer-causing chemicals are coal-tar derivatives. London chimney sweeps were the first recognized victims of cancer from tar compounds. Such cancers are rare to-day, because the danger is known and can be avoided. Studies of the cancer-causing substances from tar, however, have shown that they are very similar to chemicals naturally found in the body, such as the bile acids and several hormones from the ductless glands.

Cancer may arise, according to one theory, from a defect in body chemistry by which cancer-causing chemicals, instead of harmless and useful ones, might be formed. Assuming that this might be the case, Dr. Fieser and associates have studied animals to see what might become of the chemicals. Rabbits fed some of the cancer-causing substances failed to get cancer and excreted from the kidneys what appeared to be detoxified derivatives of the original malignant compound. Study of the chemistry involved led Dr. Fieser to the theory of vitamin K as a possible protector against cancer that might be due to faulty body chemistry.

COAL AND OIL FROM PLANT CARBOHYDRATES

FROM farms instead of mines and oil wells will come the coal and gasoline of the future, according to a prediction made by Dr. Ernst Berl, research professor at Carnegie Institute of Technology, at the one hundredth meeting of the American Chemical Society.

Already, in his laboratory, crude oil, bituminous coals, asphalts and coke have been produced from materials like corn, wood, seaweed, leaves and molasses. These are rich in compounds known as carbohydrates, of which starch and sugar are examples. The resulting coals, asphalts and oils, he said, have exactly the same properties as the natural products. So far anthracite coal has not been made, but this will be attempted in the near future.

Great advantage of the new process is that a fuel source is provided that can constantly be renewed. Nature's supplies of coal and oil are fixed. When exhausted they will not be replaced until untold ages have passed. Dr. Berl stated that he could make coal or oil from carbohydrates in from one to two hours. The method, he said, is "rather simple." It involves heating the carbohydrate materials under pressure with limestone. At present, it can not compete in price with crude oil obtained from the ground, but it is cheaper than making gasoline from coal by the hydrogenation process, which requires expensive high-pressure apparatus.

"In the United States at present there is no industrial interest in producing crude oil from cotton, wood, leaves, grass or molasses," said Dr. Berl, "but the time is not very far away when most of the easy-to-produce oil will be exhausted. Then, from all kinds of carbohydrate-containing raw materials, which the farmer can produce to a large extent, important amounts of asphalts and crude oils can be produced at prices which can certainly compete with other methods of the future. The transformation of carbohydrates furnishes an excellent liquid fuel which, thanks to the rather large amount of aromatic hydrocarbons, shows a rather high anti-knock value."

Estimates have been made that the United States possesses about 60 per cent. of the world's coal reserves and more than 50 per cent. of its oil reserves. "We have coal for perhaps 3,000 years and probably oil also for at least one generation," Dr. Berl continued. "In the future, when the low-priced crude oil will have been exhausted, methods like the distillation of oil shale and the hydrogenation of coal and carbon monoxide will be carried out. To these methods the production of different classes of substances with asphalt and crude oil properties from carbohydrates can be added. Especially in warmer climates carbohydrates are produced much in excess of what mankind would need for foodstuffs, textiles, explosives and lacquers."—JAMES STOKLEY.

NOTES ON PAPERS READ BEFORE THE AMERICAN CHEMICAL SOCIETY AT DETROIT

LARD, one of the oldest of shortenings for biscuits and pastry, can be kept fresh for from two to thirty times longer than usual by the addition of the fertility vitamin E or related synthetic chemicals, according to Dr. Calvin Golumbic, of the State University of Iowa. The excellent keeping qualities of vegetable oils, such as cottonseed and wheat germ oils, is apparently due to their rich supply of this vitamin. Lard and other animal fats which turn rancid easily are not rich in vitamin E. When the vitamin is removed from the vegetable oils, these behave like the animal fats in turning rancid rapidly. Even better than natural or synthetic vitamin E for keeping lard and other animal fats and oils fresh are the chemicals called chromans and coumarans.

ASCORBIC acid, otherwise known as vitamin C, which prevents scurvy, is twice as plentiful in strawberries as in orange juice, was reported by Mary Mann Kirk and Dr.

Donald K. Tressler, of the New York State Agricultural Experiment Station. Raspberries and turnips rank with tomatoes in vitamin C content, they stated; blueberries, plums and peaches contain smaller amounts; but scarcely a trace was found in blackberries, cherries and dewberries. Even the same fruit was found to vary greatly, for the skin contained two to four times as much proportionally as the meat. Because the weight of the skin is so small a percentage of the entire fruit, however, it actually supplies very little of the vitamin.

DR. M. A. JOSLYN, of the University of California Agricultural Experiment Station, reported that brown, discolored fruit is not only unpleasant to look at and frequently flat and flavorless to taste, but it also cheats you of the vitamins you are paying for. Dr. Joslyn has made a particular study of the kind of discoloration known as browning. This is a result of an oxidation reaction, in which vitamin C is destroyed along with the pigments that give the fruit its attractive coloration. In dried fruits, treatment with sulfur dioxide, long a standard practice for maintaining light color, was also found to check the lowering of the vitamin content.

SUPPOSEDLY necessary for all forms of animal life, vitamin A has been found entirely superfluous in at least one species—the common cockroach. Experiments demonstrating this were reported by Dr. C. M. McCay, of Cornell University, before the section on agricultural and food chemistry. A colony of cockroaches was kept on a diet known to contain no vitamin A. They should have sickened and died. Instead, they throve and multiplied in swarms. To make certain that they were not manufacturing the vitamin in their bodies, Dr. McCay made an extract from five pounds of the insects and fed it to rats kept on a vitamin-A-free diet. The rats developed all the symptoms of vitamin A deficiency. In another series of experiments, Dr. McCay discovered that for feeding trout in hatcheries, liver is a far better source of vitamin A than the cheaper ration of hog spleen commonly given to the fish. Apparently, to produce the healthiest trout for release into fishing streams, liver, though expensive, is still the best fish food.

SEAWEED is produced in immense quantities along all the world's seacoasts, yet very little of it gets used directly as human food. The Japanese make use of a jelly-like seaweed product known as agar, and in Europe a certain amount of a crisp and curly seaplant known as Irish moss is eaten. That is about all. In an effort to arrive at an estimate of the food values of these seaweed products, Dr. Hugo W. Nilson and J. W. Schaller, of the U. S. Fish and Wildlife Laboratory at College Park, Md., added graded percentages of both agar and Irish moss to the rations of young rats, weighing the animals to keep track of weight gains. They also made examinations to learn how much of the total seaweed fed was actually digested. The rats throve on most of the diets, though they did not gain weight any faster than control groups of animals fed on standard rations. The only notable exception was the group on a diet containing 10 per cent. agar; these gained 20 per cent. more weight than the controls. Rats receiving 20 per cent. Irish moss did badly: half of them died, and the survivors gained only about two thirds as much weight as the control animals. Both kinds of seaweed products absorb great quantities of water, so that the rats fed on them were very thirsty. They drank nearly twice as much water for every gram of weight gained, when 30 per cent. agar and 20 per cent. Irish moss were fed.

JAMES STOKLEY

ITEMS

THIS fall's first killing frost came a few days early, when the U. S. Weather Bureau station at Williston, N. D., reported a temperature of 31 degrees on the night of September 10. Normally, the first real frost of the season comes in the northern tier of states about September 15. The frost line commonly gets as far south as southern Minnesota and northern Nebraska by October 1. There will be a race between frost and the ripening of the corn crop. In Iowa only about one fourth of the crop is safe as yet, although warm, clear weather up until a few days ago caused encouraging progress. While the Northwest was experiencing its first chill nights, the extreme Southwest was still simmering in mid-summer heat. Early in the week a temperature of 108 degrees was reported from Phoenix, Ariz.

SILVER has multiple possibilities in the national defense program, according to a report made by Dr. Alexander Goetz, of the California Institute of Technology, to the American Mining Congress meeting in Colorado Springs. Tested potentialities range all the way from high-grade motor bearings to alloying with aluminum and magnesium in making light metal for aircraft construction. We may even eat our beans and sardines out of silver-lined cans instead of tin ones, if overseas sources of tin are cut off, Dr. Goetz stated. A sheet-steel base plated first with copper and then with silver makes a superior type of container. The silver coating need not be more than a millionth of an inch thick. The greatest immediate promise for large-scale use of silver, however, is in the field of disinfecting city water supplies. One part of silver in from 10 to 20 million parts of water will render the water safe for human consumption, even if it has been heavily infected. Costs should not be excessive—from $2 to $4 per million gallons of water. One present large use of silver is due to diminish. Methods for the recovery of hitherto wasted silver in the development of photographic films and prints, together with the rapid rise in favor of color photographs, are diminishing this outlet for the white metal, so that the discovery of other large-scale uses is desirable.

WILD morning-glories have become one of the most serious of weed pests in some parts of the corn belt; so much so, that banks and insurance companies decline loans on farms found to be infested with the smothering, strangling vines. They multiply at an amazing rate from the abundant seed which they produce, and once in the soil they are practically impossible to get out because they grow perennially from fleshy roots so deeply buried that only a trenching machine could reach them.