SCIENCE NEWS

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VITAMIN SYMPOSIUM OF THE CHEMISTS AT KANSAS CITY

NEW studies on the vitamins were reported to the American Chemical Society, on April 8, as thirty research workers in the vitamin field described their latest investigations.

Through much research and subsequent advertising the public is generally aware that the citrus fruits are good sources of vitamin C, which is the antiscorbutic vitamin; or less technically the diet factor without which people develop scurvy. Now, however, a systematic search is being made among the common vegetables to determine their respective vitamin C values also.

Peas, it is found in experiments by G. L. Mack and Dr. D. K. Tressler, both of the New York State Agricultural Experiment Station, Geneva, N. Y., and Professor C. G. King, of the University of Pittsburgh, are a good source of vitamin C in the diet. Small-sized peas, as a general rule, are the highest in vitamin C, and the vitamin content grows less as the peas grow older.

Single exception to the rule was the variety known as the Mammoth Melting Sugar pea, which has large pods and matures late. This variety had the highest vitamin C content of any of the types examined. And strangely enough, the large pods contained as much of the vitamin as did the peas themselves.

Growing chicken tissues in glass test-tubes is the method by which Professor C. A. Elvehjem and W. C. Sherman, fellow in agricultural chemistry, both of the University of Wisconsin, are seeking to learn how vitamins play the rôle of a chemical catalyst in helping prevent disease.

Professor Elvehjem and Mr. Sherman worked with vitamin B_1 whose lack causes the disease known as beriberi, or polyneuritis. In chickens this affliction causes loss of weight and appetite, muscular weakness and eventually convulsions.

Body tissues from normal chickens and those suffering from the lack of vitamin B_1 were kept alive in test-tubes for several hours by warming them to body temperature, providing plenty of oxygen, inorganic elements and organic material from which they could derive energy.

It was found that the presence of vitamin B_1 was necessary if the tissue was to be able to use lactic acid, whose combustion in the body provides much of the energy necessary for life. The lactic acid is obtained from sugar eaten by the animal or man.

Tissues from chickens in the polyneuritic condition were able to break the sugar up into lactic acid but were unable to use these acids after they were formed. Additional tiny amounts of vitamin B_1—only two thousandths of a milligram—made this vital utilization possible.

BARRIER TO VIRUS INFECTION

A STRUCTURE between the nerves and muscles of the body which acts as a barrier to stop the passage of a disease causing virus was reported by Drs. Albert B. Sabin and Peter K. Olitsky, of the Rockefeller Institute for Medical Research, New York City, at the joint meeting in Boston of the American Association of Immunologists and the American Association of Pathologists and Bacteriologists.

Discovery of this barrier may shed light on resistance to infantile paralysis. The studies reported were made on mice, not man, and concerned another disease than infantile paralysis. Like infantile paralysis, however, this mouse disease is caused by a virus that attacks the brain and central nervous system.

The barrier that checks passage of the disease virus does not exist in young mice. When the virus gets into their muscles it easily reaches the nerves, travels along them to the brain, and causes disease and death. Older mice, however, have developed this protective barrier and seem to have another barrier in the brain so that even if the virus reaches the brain, its progress is blocked there and the rest of the nervous system is protected against it. In infantile paralysis, it has previously been reported, the lining membranes of the nose in some individuals seem to act as a barrier blocking the passage of the disease virus. What makes the nose lining an effective barrier in some persons and not in others is not yet known. Studies such as these on the mouse disease may in the future provide the explanation. In the mouse disease, the barrier is apparently built up in connection with the aging process. While more children than adults get infantile paralysis, it does not necessarily follow that development of the barrier to the passage of the infantile paralysis virus depends on age.

According to another investigator, Dr. Lloyd Aycock, of the Harvard Medical School, resistance to infantile paralysis depends on constitutional factors that one is born with.

HEREDITY AS CAUSE OF CANCER

EVIDENCE of an hereditary or constitutional factor in the causation of cancer was presented and attacked at the Boston meeting of the American Association for Cancer Research.

The genealogy of a cancer family of 305 members was presented by Dr. C. V. Weller, of Ann Arbor, Mich. Starting with the founder of the family, a man who died of cancer at the age of sixty, Dr. Weller traced the appearance of the disease in succeeding generations. In the first three filial generations there were 41 cases of cancer. Most of the members of the third and fourth filial generations have not yet reached an age when cancer would be likely to appear. Of the founder's ten sons and daughters, six died of cancer. In the next generation, 27 cases of cancer were found among the 54 members of that generation over age twenty-five. In the third filial generation, in which there are 104 members over twenty-five years old, only 8 cancer cases have been reported.

If a tendency to cancer is inherited, it does not follow any definite law of heredity, it was pointed out. The ap-

parent tendency for cancer to die out in the family is due, Dr. Weller believes, to the fact that the members of the family are trying to bring the family line to a close, either by not having children or by not marrying at all. Cancer is also being diagnosed earlier in the younger generations of this family because the members are alive to the situation and consult their physician for symptoms of indigestion or other disturbances which ordinary persons would disregard.

If cancer should actually be bred out of a family, it would not be likely to reappear in succeeding generations, according to Dr. C. C. Little, of Bar Harbor, Maine. Disagreeing with the idea that a tendency to cancer is inherited, another cancer authority, Dr. James Ewing, of New York City, pointed out that people inherit "living quarters, habits and even old clothes from their forebears, as well as physical constitution." Dr. Ewing does not think the assumption of a universal tendency to cancer is justifiable.

PREHISTORIC AMERICAN INDIANS SUFFERED FROM SYPHILIS

SYPHILIS was a scourge to Indians who lived on this continent long before the coming of the white man. Such is the conclusion most strongly indicated by evidence offered before the meeting at Durham, N. C., of the American Association of Anatomists. This has an important bearing on the history of medicine, for the origin of this disease has long been a disputed point. The evidence consists of disease-marked bones found by a joint expedition of Duke University Medical School and the University of Alabama, in ancient burials at Moundsville, Alabama. Archeological conditions in the mounds make it practically certain that these burials were made in pre-Columbian times, and possibly a thousand years or more ago. The Duke-Alabama expedition was the first mound-exploring project in the United States to be conducted primarily for the purpose of finding out what diseases afflicted mound-builders. Syphilitic lesions, as nearly unmistakable as can be judged from the examination of bones alone, mark many of the skeletal remains laid out in the exhibit viewed by the anatomists. These consist largely of thigh bones, but include skulls and other bones as well. They have the swollen, overgrown, loose textured, "rotten" appearance characteristic of bone syphilis in an advanced stage. There are one or two other bacterial infections that can have somewhat similar effects on bones but a number of medical specialists who have examined these specimens agree that the weight of evidence points toward the diagnosis as given. Other diseases also shortened and made unhappy the lives of these long ago early Americans.

One skull, apparently of a man in the prime of life, had on its lower jaw a terrible out-growth of bone, an osteoma or bone tumor, which must have been the cause of its victim's death. Another smaller skull had a mal-erupted tooth breaking through the bone alongside of the nose. Other bone-diagnosed afflictions included rickets, osteomyelitis and fractures. What ills the flesh of these Indians was heir to, we can only guess, since nothing but their skeletons remain. But if the bones form a fair sample, life in ancient Redskin America was probably far from idyllic.

THE CHANGE FROM GRUB TO MOTH

HITHERTO, relatively little attention has been paid to the physiological processes that accompany the change from dormant pupa to the winged, active butterfly or moth that emerges. They knew, of course, that the seeming death was not real; the pupa or chrysalis was not dead but only asleep. But the details of the waking, in the greatly changed form, have until now not been adequately investigated.

However, researches at present in progress at Brown University have begun to clear away some of the mystery and bid fair to bring more facts into the daylight. Professor Ivon R. Taylor, of the department of biology, is applying the methods of chemistry and physics to large numbers of moth pupae, and is learning some of the secrets of the really active life that goes on beneath the surface of the rigid, sarcophagus-like chrysalis-case while the animals are so still that they appear dead.

Professor Taylor uses bee-moths as his "insect guinea-pigs," because they are very easy to raise in large quantities and easy to handle under laboratory conditions. Results obtained with them, however, can be assumed to apply reasonably closely to the larger, showier species of moths and butterflies. Bee-moths are small insects, only about half an inch in length. They are best known as parasites on bee colonies, where their strange appetite—they feed only on beeswax—makes them a destructive and dreaded pest. But that very adaptation to crowded living, and the ease of feeding them, makes them also quite valuable in the rôle of experimental animals for the laboratory.

Life-processes go on more rapidly at the beginning of pupation in males, but in females more energy is released toward the end of the period, Professor Taylor found from very delicate tests of heat given off by the pupae. To measure this heat evolution, a special micro-calorimeter was devised. It is so sensitive that it can measure accurately the heat given off by a single pupa. One of these "moths-in-the-making" gives off enough heat during a week to raise a quarter of a thimbleful of water from freezing to boiling temperature.

PHOTOGRAPHIC IMPROVEMENTS TO BE USED BY THE ECLIPSE EXPEDITION

ECLIPSE photographs that can be enlarged 500 or 600 times, spectrographic records of infra-red rays never before caught on a plate, and a full photometric analysis of the eclipsed sun's brightness, will be among the scientific trophies which the joint expedition of Georgetown University and the National Geographic Society expect to bring home from the interior of Soviet Russia, where they will set up their instruments before "the Day," which is June 19 next.

Dr. Paul A. McNally, director of Georgetown University Observatory and leader of the expedition, outlined to Science Service some of the preparations which have been made.

The highly enlargeable photographs represent an effort

to get away from the ponderous temporary "astronomic artillery" which it has always been necessary to set up for solar photographs during an eclipse. They have been necessary because of the graininess of rapid photographic emulsions hitherto in use, which necessitated big plates taken through long focal lenses, if astronomers were to get any kind of detail to study.

Dr. McNally, using relatively short focal length cameras and fine-grained photographic emulsions, secured at the 1932 eclipse (Georgetown University total solar eclipse expedition) pictures that rank among the finest ever obtained of any eclipse. These pictures have been successfully enlarged as much as 100 times. Now, thanks to the cooperation of Dr. C. E. K. Mees, of the Eastman Laboratories at Rochester, N. Y., a still finer emulsion has been applied to glass plates for the first time. Dr. McNally hopes to obtain photographs that will enlarge up to 600 times. Such highly enlargeable photographs will permit the use of smaller, more easily carried and managed instruments, since the originals do not need to be so large.

An important part of the expedition's work will be the photographing of the sun's spectrum, or broken-up rainbow-band of light, during the eclipse. Thanks to the development of five new emulsions especially sensitive in the infra-red, photographs of this hitherto unstudied part of the spectrum will be obtained. The expedition will carry glass plates of a unique type, each one bearing all five of these emulsions in adjoining strips or zones, laid down "on the bias" to provide overlaps. The first of the emulsions is sensitive to infra-red rays up near the lower limit of the visible red, and thence they range in sensitivity down to an emulsion especially adapted to the deep infra-red rays of 12,000 Ångstrom units wave-length.

When the first of these infra-red sensitive emulsions was brought out, some years ago, the plates could not stand being warmed at all, and had to be kept in a refrigerator. Since then, this instability has been largely overcome.

Another set of five special emulsions, each especially adapted for one group of wave-lengths in the visible spectrum, will be used on five- by seven-inch plates, in the equatorial-mount camera. These will give photometric measurements of the light intensity in their respective parts of the spectrum. These measurements can be used directly in technical astrophysical studies, and they can also be used as the basis for a composite color-picture of the eclipsed sun, in hues of a scientific accuracy hitherto unattempted.

Direct color photographs will also be made during the eclipse, using negatives of the DuFay process, and in addition a small motion picture camera, attached to the equatorial mounting, will make Kodachrome movies of the eclipse.

The expedition will sail April 10. They will set up their apparatus somewhere near the town of Kustanai—about 500 miles east of Orenburg, because past weather records indicate that this region offers better-than-average chances of good weather at the time of the eclipse.

It is expected that the National Broadcasting Company will set up a station at the Georgetown University-National Geographic site to furnish details for their American listeners at the time of the eclipse. While the eclipse takes place at Kustanai at 8:40 A. M., local time, on June 19, the broadcast would reach hearers in the United States on the previous day, June 18, at about 10:30 P. M., E. S. T. Dr. McNally has been requested to speak to the American audience immediately after the eclipse.

ITEMS

RECENT weather conditions have been decidedly unfavorable for agricultural work, according to the crop summary report of the U. S. Weather Bureau of the U. S. Department of Agriculture. Where tornadoes and flood did not do damage in the southeast, heavy rains have made the soil too wet to work for spring planting. The Midwest and Northwest had abnormal cold, unprecedented in many places, which prevented outdoor operations. In the Central-Northern states the soil again became frozen with little field work possible. In some sections of the southwest it still is extremely dry with dust storms threatened.

STUDIES in Moscow of the two giant gold nuggets discovered in the Tyelguin mine in the Ural Mountains have now been completed. Their weights, as finally established, are 9,420 and 14,318 grams, respectively, or approximately 21 and 31.5 pounds. The nuggets are quite unique and have a very interesting structure. Each nugget represents a very fine transparent net consisting of lamellar, octagonal, needle-shaped and wire-shaped gold crystals forming quaint concretions. The nuggets will be sent to the Diamond Fund of the USSR.

THE recent claim that fingerprints of two individuals have been found to be "almost identical" is refuted by John Edgar Hoover, director of the Federal Bureau of Investigation, U. S. Department of Justice. A report from the State of Washington recently credited two men with having fingerprints "almost identical." "The fingerprints of the individuals in question have been examined by the identification experts of the FBI who have pronounced the impressions as readily distinguishable from one another," Mr. Hoover stated. "Such incorrect reports which may tend to shake public confidence in fingerprint identification as an accurate science, should be refuted as soon as possible."

HEALTH departments should help the private physician to care for his patients by furnishing diagnostic tests, serums for treatment, and nursing care when the patient can not pay for these items of medical care, in the opinion of Dr. Thomas Parran, Jr., given in his first interview following his installation as Surgeon-General of the U. S. Public Health Service. "A very important phase of public health work is the furnishing of aid to private physicians in helping them to practice preventive medicine." Physicians who serve indigent patients, whether in their homes or in clinics, should be paid for their services. Dr. Parran declined, however, to discuss medical-economic problems further, saying he has no prescription for meeting the diverse medical problems of the nation.