SCIENCE NEWS

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MOISTURE LOSSES AND GAINS IN PLANTS

PLANTS have "drinking hours" during which their roots absorb more water than is evaporated from the leaves, Dr. Paul J. Kramer, of Duke University, has determined.

They also have "evaporation hours" during which the amount of moisture given off exceeds that absorbed, he reports to the *American Journal of Botany*. Moreover, the hours of maximum absorption and of maximum transpiration, as the reverse process is called, are remarkably constant.

Various types of plants in pots mounted on a revolving table in a greenhouse, apparatus for determining moisture losses and gains and for determining the water content of leaves were the experimental raw material used by Dr. Kramer. The hours of noon to 4 P.M. are the hours of maximum water absorption as well as of transpiration, with the balance in favor of the latter. But the plant is not the loser, for although both processes reach a low during the night, absorption is carried on at a rate sufficiently faster than the rate of loss during the day to more than make up for the water loss.

The common prickly-pear cactus proved to be the only exception to the general rule of noon to four o'clock as the period of greatest evaporation. This cactus, as well as other cacti, reached its peak in transpiration and absorption between 6 and 10 P.M. During that time transpiration was greater for a time, then absorption forged ahead.

Specimens of loblolly pine, cactus, sunflower and ash were grown in small flower pots equipped with an "autocone" irrigator, which controls the water supply automatically and gave the botanist a means of checking on how much water was taken up by the plants. The soil in the pots was covered with two thicknesses of oil cloth to make sure that there was only a negligible amount of evaporation of water from the earth.

THE CHINESE LOHON PLANT

THE Chinese Lohon plant, known only from its dried fruits until Dr. G. Waldman Groff brought complete specimens out of the deep interior of the country, is without mystery in at least one respect, according to botanists of the U. S. National Herbarium and the U. S. Department of Agriculture. From fruits and seeds it has long been known that the plant is a cucurbit, that is, a member of the family that includes melons, gourds, pumpkins, squashes and cucumbers. Its more exact classification will be possible after specimens now on the way arrive in Washington.

The dried fruits have long been prized articles of Chinese commerce. Steeped as a tea or served in soup, they are claimed by the Chinese to be sure cure for colds, soothing to upset stomachs in hot weather, and a general panacea. The fruits are used by cooks rather than physicians for, in China, the cook is in disgrace if a member of the family gets sick enough to require a doctor.

The reputed qualities of the Lohon are reflected in the meaning of its name, which carries the implication of an excellence almost supernatural. The really proper English rendition of the Chinese name is not Lohon but Loh-han, according to Dr. Arthur W. Hummel, of the Chinese Division of the Library of Congress. This in turn is derived from a Sanskrit word, Ara-hat, which is a reference to a way of life leading to sure and eternal salvation.

In Chinese temples the Eighteen Loh-han are deeply reverenced. These are by tradition eminent sages or saints who were reincarnations of the Buddha. Naming the fruit for these great figures in Chinese religion is analogous to the giving of such religious names to plants as yerba santa (holy herb) by the Spaniards, or calling cocoa, theobromos, which means "food of the gods." New knowledge of the Lohon or Loh-han is being developed as a result of a joint expedition of the National Geographic Society and Lingnan University which Dr. Groff led into the remote mountains of Kwangsi province, where the vines are cultivated.

THREE-DIMENSIONAL MOTION PICTURES

THE motion picture of the future promises to have the "depth" or perspective of real life with the sound localized as it is from a stage or actual scene. Sound perspective or "stereophonic" movies were shown by J. P. Maxfield, of Electrical Research Products, New York, and three-dimensional movies produced by use of polarized light were shown by G. W. Wheelwright, of the Land-Wheelwright Laboratories, Boston, at the recent meeting of the Society of Motion Picture Engineers.

By adding sight and sound perspective to the conventional color and faithful sound of theatrical movies, themselves hardly a decade old, the motion pictures of a few years in the future promise to reproduce all attributes of the senses of sight and sound. The sound perspective movies are a development of the three-dimensional sound system demonstrated a few years ago by Bell Telephone Laboratories before the National Academy of Sciences. It consists of two independent sound systems that feed two loud speakers so arranged that the sound from the screen is given direction and depth. On this new stereophonic film, two sound tracks are squeezed into the space on the film where one is usually placed. Theaters to use the new system would need to have two sound systems instead of one.

The movies that are three-dimensional in sight utilize polarized light to produce the effect. The audience wears glasses with lenses of Polaroid, a synthetic substance that cuts out all light except that which vibrates in one direction. One lens is blind to all the light that the other lens can see. In taking the Polaroid movies, two cameras are used with similar lenses, and the projector has a similar optical system. Two movies are flashed on the screen simultaneously, but each eye can see only one. The two movies are taken from distances apart similar to the spacing of the human eyes. The principle is that of the

old, successful and simple stereoscope that a generation ago graced the parlor table. The actors and scenes appear as though in three dimensions.—WATSON DAVIS.

THE NATIONAL SAFETY CONGRESS

THE accidental deaths last year of 111,000 Americans, in the opinion of the National Safety Congress, were, in a large number of cases, avoidable, and the focus of the delegates' attention during the discussions at Kansas City was on the growing list of casualties claimed by an industrial and automobile age. Appliances that make machines safer by making them fool-proof were exhibited at the congress and safety problems of almost every field of endeavor practiced in the country were considered.

MORE than a quarter of a million industrial workers in the United States lost time from their jobs last year because of skin diseases directly traceable to chemicals and other substances they were required to handle as part of their jobs, Dr. Louis Schwartz, medical director of the U. S. Public Health Service's dermatoses investigations, reported to the congress. Many of these workers develop allergies, states of super-sensitivity, to the particular substances with which they come into contact, Dr. Schwartz stated in recommending increased safety measures to cut down on industrial hazards. Each case of industrial skin disease costs on an average $200, he asserted—$100 as compensation to the workman and a like amount for medical care. Blonds and fair-skinned people are more susceptible to skin trouble from chemical irritants than are darker, oily-skinned people. Some workers, on coming into contact with a chemical, may develop a slight form of skin disease and after that be immune, but many do not ever become so immune. Lack of cleanliness in the shop as well as on the part of the individual, was blamed as a primary contributing cause.

THE horse and other animals are second on the list of causes of accidents on the farm, J. C. Mohler, secretary of the Kansas State Board of Agriculture, reported to the congress. More than a quarter of the 109,000 farm accidents last year involved livestock. Automobiles, tractors and motorized farm machinery caused more than 38 per cent. of the total number of accidents, of which nearly 5,000 were fatal. Agriculture on the basis of these figures and on the basis of the number of people employed in it is the most hazardous industry in the United States. Unusually high accident rates among farm children were also reported. Farm safety problems, with the continued growth of the use of machinery and the growing complexity of new implements, is becoming a more difficult problem to solve.

AN ANTI-TUBERCULOSIS VACCINE

AN anti-tuberculosis vaccine to protect young children from the disease has been developed at the Saranac Laboratory, Saranac Lake, N. Y. Encouraging results with animal trials of the vaccine were reported by Dr. H. M. Kinghorn and Morris Dworski at the recent meeting in Baltimore of the American Clinical and Climatological Association.

The vaccine, the result of eleven years of work at the Saranac Laboratory, is still in the experimental stage. Dr. Kinghorn and Mr. Dworski stressed the point that reliance should not be placed solely on vaccines to prevent tuberculosis, but that all present precautionary measures should be faithfully and carefully carried out. The vaccine is obtained from the caseous or cheesy tuberculosis mass in the center of a cow's lung or cow's gland, and is thoroughly sterilized before using. It has been tested against the vaccine of Robert Koch, and found to be much superior. It has also been tested against the vaccine called BCG of the late Dr. A. Calmette, of the Pasteur Institute of France, and has been found to be of equal value.

Calmette's BCG is an attenuated or weakened bovine or cow tubercle bacillus. The vaccine of the Saranac Laboratory contains a virulent bovine tubercle bacillus, which has been killed. Dr. Kinghorn hopes that this caseous vaccine, when perfected, will be of decided value in preventing the development of tuberculosis in young children who have no tuberculosis.

THE SURGICAL TREATMENT OF DEAFNESS

A DELICATE surgical operation which promises to cure deafness has been reported by Professor Maurice Sourdille, of the School of Medicine at Nantes, France, to the New York Academy of Medicine.

The new operation will not bring hearing to every deafened person. Even those shown by careful tests to have a hearing defect suitable for correction by this operation can not hope to have the operation performed at present. Much study of the method and of results so far accomplished are necessary before the operation will be performed universally on a large scale. This caution was made perfectly clear by both Professor Sourdille and Dr. Edmund Prince Fowler, of New York, who, acting as chairman of the meeting, introduced Professor Sourdille.

One of the chief obstacles to immediate application of the new technique on large numbers of patients is the difficulty of performing it. Professor Sourdille uses both magnifying glasses and microscope in this operation. Complete and permanent loss of hearing and even death may result if the surgeon has not the necessary skill. The operation must be performed in three or four stages, several months apart, in order to lessen this danger, and the patient must remain in a hospital in order to have the wound dressed every day.

Another obstacle is the difficulty of selecting suitable cases. The operation is designed to relieve deafness due to otosclerosis, the condition in which hearing is lost because of bone formation in the opening into the inner ear. This prevents the passage of sound waves from the outside to the nerves of hearing in the inner ear.

Professor Sourdille's operation provides a new circuit for the sound waves. He cuts a hole through the bone into the inner ear to provide a substitute passage for sound in place of the one blocked by the abnormal bone formation in otosclerosis. This has been done before by other surgeons, and the patients heard again, but the restored hearing was often not permanent. It lasted for a few days or at most months, because the new opening

closed up. To overcome this difficulty, Professor Sourdille has devised a method of covering the new opening with a flap of scar tissue obtained from the ear canal. These procedures permit the sound waves to go through to the nerves of hearing keeping the new opening from closing. Some of the patients operated upon by Professor Sourdille have retained the improvement in hearing for as long as eight years, which is the longest interval since he performed the first successful operation by the new technique.

In properly selected cases good results can be expected in from 70 to 80 per cent. No other method, either surgical or medical, ever before has been so successful in maintained restoration of hearing in proved cases of otosclerosis. More important, perhaps, than the benefits received by the 140 patients whose hearing was improved is the fact that the work opens a new field of research into the causes of otosclerosis. Some of the results suggest that the old theories of the cause of the condition do not correspond with the facts. Much new study will be necessary to finally determine the causes of otosclerosis, but when these are advanced, new methods of treatment and even of prevention may be hoped for—JANE STAFFORD.

ITEMS

A LARGE meteorite, possibly the largest yet known in the Soviet Union, is being sought for in the Komarinsk district of White Russia, following the discovery of two fragments. One weighing 300 kilograms (about 660 pounds) has already been turned over to the Geological Museum of the White Russian Academy of Sciences for study. The other, just found, weighs 16 kilos (about 35 pounds). Both are iron meteorites.

TASS, Soviet news agency, states that a large cemetery of dinosaur bones has been found in the Kzyl-Kum Desert, near the Aral Sea. An unusually complete succession of forms begins with small amphibians and ends with monstrous reptiles which were sometimes nearly 100 feet long. These bones, as well as petrified trees, indicate that in long past geological time this territory, which is now a desert, was rife with vegetation.

DEFINITE proof that there is no such thing as a stationary species has been secured by two workers at Amherst College. Experiments conducted by Professor Harold H. Plough and George P. Child are claimed to demonstrate that a minimum rate of change occurs under "the most constant environmental conditions." The studies were carried out on the fruit fly, *Drosophila melanogaster*, but Professor Plough and Mr. Child have generalized the statement to mean "that there is no such thing as a static species in nature." Fruit flies in their laboratory during fifteen generations showed changes in structure and in the nature of their genes, which carry hereditary factors from one generation to the next.

TWO new and rare minerals, antofagastite and dandylite, discovered by a joint Smithsonian Institution-Harvard expedition to Chile, have been added to the list of about 1,200 known rock components. Lichen-like greenish crusts found on rocks brought back from the district of Antofagasta, Chile, by Mark C. Bandy, leader of the expedition, were found to be copper chloride, a common substance in chemical laboratories, but never before found in nature. This mineral has been named antofagastite by Drs. Charles Palache, of Harvard, and W. F. Foshag, of the National Museum. Minute blue crystals, composed of boron, chlorine and copper, never before discovered, have been named bandylite, in honor of their discoverer. Both these minerals occur near the surface, in what miners call the oxidized zone. Antofagastite dissolves in water; bandylite is dissolved by ammonium hydroxide. Both rare minerals color a flame green.

ICE formation on airplane wings may be prevented by a simple and efficient system of utilizing waste heat from the exhaust pipe of the airplane's engines. The process has been patented by two engineers of the National Advisory Committee for Aeronautics. The inventors of the new "ice preventer" are Dr. Theodore Theodorsen, of Hampton, and William C. Clay, of Buckroe Beach, Va. Readily installed in airplanes of any type, the system utilizes vapor heat by projecting it against the leading edges of the wings where ice generally forms. The heat warms the wings and prevents ice formation. The vapor heat is produced in a boiler or tank which is built around the engine exhaust pipe. The waste, hot exhaust gases passing through the exhaust pipe transfer their heat to the water in the boiler and vaporize it. The hot vapor travels through a pipe into a long, perforated, distributor pipe which lies inside the wing adjacent to its front edge. Out of the perforations the heated vapor shoots in a series of jets against the leading edge of the wing. The hot-water vapor keeps the wings warm. The condensed vapor flows into pockets inside the wing, where it drains down pipes back into the boiler. It is again converted into hot-water vapor by the hot exhaust gases. Thus the ice-preventing system is a continuous one.

A CASE of relationship between nests and mating of some birds is reported by Professor N. Manteifel, director of the State Zoo, Moscow. Hundreds of small Australian parrots, living in the zoo's huge cages, stubbornly refused to mate. With every artifice known to breeders exhausted, it was decided to try the effect of dummy nests. Wild parrots in Australia usually nest in hollow trunks of eucalyptus trees and the imitation nests were made as like them as possible. At once a vigorous change was observed in the behavior of the birds. The male and female parrots, so long indifferent, quickly paired off. Anatomical study showed the sex organs in both male and females attained full maturity in a few days. The mating period, however, almost instantly broke off, as soon as dummy nests were experimentally removed from the zoo's cages.

BIRD experts of the National Park Service will report this month to their eastern headquarters results of a survey of snowy egrets at a reservation on historic Lazaretto Point near Savannah, Ga. Once in danger of extinction from ruthless hunters who prized its long white plumes, the egret is believed to be out of danger. Exact data will be supplied by the study now under way.