SCIENCE NEWS

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PAPERS PRESENTED BEFORE THE GEOLOGICAL SOCIETY OF AMERICA

GREAT mud-laden "waterfalls" deep down in the ocean are pouring the sediment of California rivers into ocean bottom basins, Professor F. P. Shepard, of the University of Illinois, told the recent meeting at Berkeley of the Geological Society of America. About 150 miles west of San Diego and far under water is a submerged 10,000-foot mountain whose slopes have been found to be absolutely bare of the sediments which one might expect to find. Bare, too, are submarine canyons off the California coast out to depths of 5,000 feet. This raises the point of what happens to the tons upon tons of sediments borne to sea by California rivers. According to Professor Shepard: "A large amount of the sand poured in by rivers is brought back by the waves which distribute it on the beaches while the bottom currents carry the mud out over the (continental) sheaf into the deeper troughs and basins outside. The submarine canyons are kept clear of sediment largely by means of the great mud flows although currents are partly responsible."

The wide-spread sage-brush of the Great Basin area of the far west probably got its start because the Sierra Nevada-Cascade mountain range rose up and blocked off moisture-bringing winds from the Pacific, according to Dr. Daniel I. Axelrod, of the University of California. By a study of fossil plants he has been able to learn what plant life was like in the Late Pliocene era about 1,000,000 years ago. About this time, Dr. Axelrod reported, a great change in the weather occurred in the West. On the northwest coast, over what is now Oregon and Washington, rainfall dropped from 25 inches yearly to the 13 inches it is to-day. And in southeastern California it fell from 12 inches yearly to the three inches of rain which now falls on the land. The slow rise of the Sierra Nevada-Cascade Mountains probably was the basic cause of this. As they rose these ranges gradually intercepted more and more of the rain-bearing Pacific winds. Plants able to live in the increasingly drier climate prevailed. Sage-brush became king. A few of the Pliocene trees managed to survive—the pinyon pine, juniper, cottonwood and antelope brush—in Nevada. But generally they have continued to exist only in the mountains and on a few favorable sites bordering deserts.

Intensive studies of records of many California earthquakes have shown the "keel" of the southern Sierra Nevada mountain range, is stated in a paper by Professor Perry Byerly, of the University of California. One theory of geology, Professor Byerly recalled, is that mountain ranges are masses of heavy rock "floating" in weak rock not unlike ships floating on the ocean. The new discoveries indicate that the mountain ranges have a keel. Actually the keel seems to be a root of granitic rock penetrating much deeper into the weak rock under the range than does the range itself. Bottom of the Sierra Nevada range appears to be at a depth of 20 miles. The keel goes down still farther.

Fifty miles below the surface of the earth the ordinary crystalline structure of rocks gives way to a glassy condition, according to Professors B. Gutenberg and C. F. Richter, of California Institute of Technology. Studies of the records of earthquake vibrations have revealed this new knowledge. Highly important to geology is the discovery for it has long been suggested that the earth consists of many concentric shells of different materials packed, one around another, like the layers in an onion. "From all the evidence," Professor Gutenberg said, "it may be calculated that certain physical properties change at a depth of about 50 miles. From other clues we conclude that this depth is probably that at which the crystalline structure of the rocks is reflected by a glassy condition."

PAPERS PRESENTED BEFORE THE AMERICAN PHARMACEUTICAL ASSOCIATION

A METHOD for detecting the presence of carbon monoxide in very minute quantities, as an impurity in oxygen intended for human inhalation, was described before the meeting in Atlanta of the American Pharmaceutical Association by Drs. Frederick K. Bell and John C. Krantz, Jr., of the School of Medicine of the University of Maryland. Oxygen is supplied compressed in cylinders for use by pneumonia patients and other critically sick persons, aviators at high altitudes, firemen, mine rescue workers, etc. The presence of even small quantities of poisonous carbon monoxide would of course be extremely dangerous, particularly in hospital use. The test is made with a reagent consisting of a dilute mixture of blood and pyrotannic acid. This is gray-brown in the presence of uncontaminated oxygen, but turns pinkish when it comes into contact with carbon monoxide in mixtures even as dilute as five parts per million.

EXPERIMENTS with an old-fashioned remedy which has long been discarded as of no particular value showed it to be capable of relaxing cramps in certain of the body organs was brought out in a report by Dean A. Richard Bliss, of the School of Pharmacy of Howard College, Birmingham, Ala. The drug is *Potentilla anserina*. It grows as a common weed everywhere, but Dr. Bliss had to send to Germany to get it in prepared drug form. Experiments on animals brought out its almost-forgotten value.

THE value of sodium hypochlorite solutions for treating athlete's foot was emphasized at the meeting of the American Pharmaceutical Association, by Drs. J. B. Vaughan and H. George DeKay, who reported the results of experiments carried on at Purdue University. Solutions of the chemical as weak as one tenth of one per cent. in available chlorine were found capable of inhibiting the growth of the fungus that causes athlete's foot, when permitted only 20 seconds' contact.

PECTIN, the stuff that makes jelly "jell," is the base of a new type of medicated paste that is having great success in the healing of bed sores and stubborn ulcers. Dr. Bernard Fantus and H. A. Dyniewicz, of the University of Illinois Medical College, stated that advantages claimed for the new paste are that it gives the healing tissue a more nearly natural medium in which to grow, that it needs to be changed less often than the dressings now used, and that its cost is much lower. To the base, which may be either pectin or gum tragacanth, Dr. Fantus and Mr. Dyniewicz add Ringer's solution, which is a synthetic approximation of the inorganic parts of the blood fluid. The paste is applied thickly, covered with a piece of waterproof transparent cellulose sheeting, and the dressing fastened down with adhesive tape. Different medicaments may be added for specific types of ulcers: sulfanilamide for streptococci, ethyl aminobenzoate for painful ulcers, urea when necrotic tissue is present, etc.

"MELANOID," A SKIN PIGMENT

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"MELANOID," a hitherto unknown kind of coloring matter, has been discovered in skins of all peoples, from pale blonds to Negroes, through the use of a new optical instrument, the recording spectrophotometer. This discovery, made in the course of researches by Dr. Edward A. Edwards, of the Harvard Medical School, and Dr. S. Quimby Duntley, of the Massachusetts Institute of Technology, raises the number of known skin pigments to five.

The researches of Drs. Edwards and Duntley constitute the first precise study ever made of the complex factors underlying variations in the color of human skin. The investigation, which may have significant bearing on many important and puzzling medical problems, is in progress at the Massachusetts Institute of Technology. Already the results are enabling doctors to diagnose anemia far more effectively than has been heretofore possible and to watch minutely the progress of attempts to stem its wasting tide. The experiments may also afford medicine a valuable diagnostic tool and method of observing treatment in circulatory disorders and various vascular and skin diseases, and may also contribute to studies of disturbances of the endocrine, or ductless, glands which produce those all-important chemical messengers of the body, the hormones. Disorders of these glands underlie a wide variety of far-reaching bodily ills.

Key instrument in the research is the recording spectrophotometer developed by Professor Arthur C. Hardy. With its aid it has been possible to make speedy and precise analyses of skin colors which are as objective as the temperature readings of a thermometer. Thus not only does it improve on previous methods, which have relied largely on the erratic human eye, but it also automatically analyzes the color of the skin by examining its capacity to reflect light at each separate wave-length, a task impossible for the human eye.

Melanoid is a diffuse form of melanin, long known as a skin pigment. Melanin is characteristic of brunets, and dominates the complexions of Negroes and other black races. A third pigment, carotene, which is responsible for the hue of carrots, has never previously been recognized as a color component of the human skin. The other two pigments involved in skin color, and the most important in producing its pinkish flesh tint, are the two forms of hemoglobin found in the blood, oxy-hemoglobin and reduced or oxygen-free hemoglobin. The turbidity of the deeper layers of the skin furnishes an added effect of light-scattering, which adds a bluish component to the general skin color. Without this scattering, a phenomenon probably best known for giving the sky its blue, the normal skin would appear much like a piece of Cellophane-wrapped, raw beefsteak.

All peoples have these five color pigments. Variations in skin color, from Nordic to Negro, are due entirely to the proportions in which they are blended. Melanin and melanoid are particularly important, for their abundance results in a dark skin and a lack of them gives a light skin. The bodily distribution of these pigments is identical for all races, but the amount is purely a matter of constitutional and racial factors. White men have the least melanin, they found, and it steadily increases in the Japanese, Hindu, Mulatto and Negro, in that order.

The research is reported in the current issue of *The American Journal of Anatomy.*

SKIN RASH FROM SYNTHETIC INSECTICIDE

DISCOVERY that a new synthetic insecticide was causing a skin rash or dermatitis among the workers who handled it in the chemical manufacturing plant where it was being made for the market has resulted in suspension of operations for the time being. Drs. Louis Schwartz and Leon H. Warren, of the U. S. Public Health Service, who investigated the case, recommend that all insect sprays be given a cautionary label, for any of them is capable of injuring sensitive persons, with damage suits against manufacturers as a possible consequence.

The new chemical is known as alpha naphthyl isothiocyanate. Although not so poisonous to flies as pyrethrum and derris, vegetable poisons now commonly used in sprays, it is so much cheaper that it was intended to mix it with these ingredients in commercial liquid insecticides. Then it was discovered that some of the chemical workers who came into contact with it were getting a troublesome rash on their skins. Investigation by the U. S. Public Health Service followed.

It is not thought at present that manufacture of the chemical must be stopped permanently, especially since the ingredients already used in insect sprays are known to be poisonous to some persons. If manufacture is resumed, the compound is to be handled only in a closed system of containers, filters and pipes, by workers well protected with inhalers, goggles and special clothing.

Finally, Drs. Schwartz and Warren make the following recommendations for all spray insecticides, including those now on the market: "The directions on the cans should be worded in such a manner as to impress on the consumer the fact that the contents are toxic and irritating to the skin unless they are used according to directions. This would place the emphasis on their toxicity and tend to make people more careful in using them. Indeed, placing poison labels on all insecticides would better safeguard

not only the health of the consumer but also the financial interests of the manufacturer by helping to protect him against lawsuits. The directions for use should state that in spraying these substances protective clothing should be worn, the face and other portions of the skin should be exposed as little as possible to their action, and that the containers should be kept away from articles of food and out of the reach of children.''

CORN AND TEOSINTE

CORN is not descended from the heavy-stalked Mexican grass called teosinte; more likely teosinte is descended from corn. Evidence pointing strongly in this direction was presented at the opening session of the seventh International Congress of Genetics, by Professor P. C. Mangelsdorf, of the Texas Agricultural Experiment Station.

It has long been contended that corn was derived, in some long-forgotten age, from teosinte, largely because teosinte grows abundantly in the wild state in Mexico and Central America, where corn, whose wild ancestor has never been found, was the staff of life of the great Indian civilizations.

Professor Mangelsdorf, suspecting that teosinte, not corn, might be the descendant, tried making hybrids of corn with a related wild grass, Tripsacum. He obtained intermediate forms, that suggested teosinte in some of their properties. A critical re-examination of teosinte disclosed the interesting fact that every character of teosinte is found in either corn or Tripsacum, or is intermediate between the two. Not only is this the case, but analysis of the heredity-bearing chromosomes within the cells of his hybrid plants showed that the germ-plasms of corn and Tripsacum are capable of the intimate mixtures and interchanges that are required for the origination of stable hybrid forms.

As more probable ancestor to corn, Professor Mangelsdorf pointed to pod corn, a strange type with each kernel covered in an individual husk, now grown only as a curiosity. He suggested that a wild pod corn may still be growing, somewhere in the lowlands ''back of the Andes,'' in whose valley and plateau lands corn was first extensively used by highly civilized Indian nations.

ITEMS

THE home of the world's weather—the zone of atmosphere just above the surface of the earth where warm and cold air masses intermingle to produce rain, clouds and hot and cool spells—has now been shown to act as a mirror for radio waves. Professor R. C. Colwell and A. W. Friend, of West Virginia University, describe their studies of radio reflections at the sharp boundaries between hot and cold air layers in *Nature*. The radio mirrors are not at extreme heights of scores of miles in the ionosphere at the place where radio reflections are commonly known to occur. Rather they appear to come in the troposphere at altitudes no greater than a mile and a half or about 9,000 feet. Some seem to occur as low as 6,000 feet. Three years ago such reflections were suggested from radio measurements alone. Now they give, side by side, a comparison of the radio reflections and the existing height of the layers of temperature inversion in the troposphere. Airplane flights directly over the experimental radio transmitter used in the tests during the times of the experiment furnished accurate, conclusive proof of the equal heights of the sharp temperature boundaries and the place of radio reflection.

A SUCCESSFUL and cheap method for manufacturing colloidal fuel from coal is being sought, through an industrial research fellowship at Kansas State College. Although colloidal fuel is not now being used industrially anywhere in the United States, investigations to date have offered promise of finding a technique which would be cheap enough to make it an important possibility for railroad fuel and for use in power plants where either fuel oil or pulverized coal is now burned. Dean R. A. Seaton, of the Division of Engineering of the Kansas State College, explained that a satisfactory colloidal fuel would help to utilize effectively the petroleum supplies of the United States.

EUROPEAN sleeping sickness, a disease that has appeared during post-war years, may be growing weaker, or mankind may be growing stronger against it. These alternative hypotheses for its declining incidence are offered by the Matheson Commission which has been investigating the disease, under the chairmanship of Dean Willard C. Rappleye, of the School of Medicine of Columbia University. Epidemic encephalitis, as the disease is technically known, has been attacked with various medical weapons. Newest is benzedrine sulfate, the so-called ''pep pills'' of exam-cramming students. It is given either alone or in combination with atropine. The combination treatment is said to yield best results. However, a real cure seems still as remote as it did ten years ago.

A NEW type of organic resin material which can be made into artificial silk fibers has been patented at the U. S. Patent Office by the Canadian inventors, George O. Morrison and Aubrey F. Price, of the Province of Quebec. The new resins are of the vinyl-acetyl type. Fourteen different ways of preparing them are described in the patent, which has been assigned to Shawinigan Chemicals, Ltd., of Montreal. Three of the methods yield materials ''suitable for the manufacture of threads of artificial silk.'' Other forms also have wide use. Some are suitable for the interior lining of bottle caps and cans because of their insoluble properties. Others can be made into clear, colorless transparent sheeting suitable for wrapping materials.

DR. SAMUEL F. HILDEBRAND, of the U. S. Bureau of Fisheries, has made a detailed study of the fish found in the Panama Canal when the locks are dewatered, and reports 159 species, ranging in size from anchovies to tarpon, as well as crabs, shrimp and several other kinds of invertebrates. Not all the 159 species are known to pass through the canal. The water changes from salt to brackish to fresh and back to salt again so that both freshwater and saltwater fishes have to be able to adapt themselves rapidly to changes in both salinity and temperature. Not many fish can do this; nevertheless a considerable number of Atlantic fish have been found in locks opening to the Pacific, and *vice versa*.