SCIENCE NEWS

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PEKING MAN

CASTS made of the space once occupied by the brain, in the skulls of half-million-year-old Peking Man, show many remarkable ape-like features, despite the indubitable fact that this oldest inhabitant was definitely human. Some of these features were described recently by Dr. Franz Weidenreich, leader of excavation work in the Choukoutien caves near Peiping, in the annual James Arthur Lecture, at the American Museum of Natural History.

Dr. Weidenreich reported that although the volume of Peking Man's skull space is definitely in the human range and far above that of the apes, the distribution of that space is not in accordance with that of the present day. The arch of the cranium is very low, and the greatest breadth of the skull lies low and toward the rear. All of this minimizes the forebrain, usually considered to be the center of the higher, more intellectual part of the brain's activities.

Not only in bulk but also in detail was the forebrain of Peking Man less developed than that of modern human beings. The folds and furrows were fewer and simpler, more on the ape pattern than those of modern brains. Furthermore, the blood supply, traceable through the grooves in which the arteries fitted under the skullcap, was relatively scanty and not elaborately distributed. This again is an ape-like character; modern human cranial arteries that serve the forebrain are much more abundant and elaborately developed.

Peking Man's teeth, like his brain, are undoubtedly human, yet show some interestingly simian features. They are bigger and longer-rooted than modern human teeth, and there is no sign of reduction or degeneration in the wisdom teeth. The pattern of the grinding surfaces on the molars is complex, like that of ape teeth, in contrast to the relatively simple, cross-grooved pattern of teeth in modern man. Of especial interest is the total absence of dental caries, traces of pyorrhea, and other symptoms practically universal among present-day human beings and frequent even among more recent Stone Age races. Among the 148 teeth of Peiping Man thus far found, not one is defective.

FOSSIL LAND ANIMALS AND CONTINENTAL DRIFT

DRIFTING continents and great trans-ocean land bridges were not necessary to explain the distribution of life during the earth's past ages when coal was forming, according to Dr. Charles L. Camp, geologist at the University of California. Distribution of fossil land animals does not support the theory of continental drift, but strengthens the idea that the continents have always been land and the oceans always full of water.

To explain the distribution of plants and animals of past ages, geologists have evolved a number of theories: (1) That in early times there was only one continental land mass, which broke up. The fragments, gradually evolving into our present continents, drifted slowly around the earth, carrying with them the primal animals, ancestors of some of our present forms. (2) That there were great land bridges extending across the South Atlantic, over which animals and plants migrated from continent to continent. These bridges, according to theory, foundered into the oceans not so many millions of years ago. (3) That the continents have always had about their present shape and distribution, with occasional submergence of some low-lying areas, and upraising of shallow sea floors to become land.

Discussing his evidence, gained from a study of the fossil land animals of the continental areas, Dr. Camp finds that they probably migrated from Eurasia to America over northern land connections, and that neither drifting continents nor land bridges in areas that are now deep sea are needed to explain their distribution. Using only large land animals, that can not swim long distances or be carried by birds or wind, as evidence, Dr. Camp solves the problem of conflicting evidence. Long ago it was shown that the plant and water-animal life of South America greatly resembled similar life forms in Africa, and on this resemblance many geologists contended for continental drifting and land bridges. Other geologists pointed out that birds can carry plant seeds, winds carry fern spores, and that water animals generally travel by swimming, needing no land bridges or drifting continents to explain their presence in Africa and South America.

Southern amphibians and reptiles, according to Dr. Camp's interpretation of the fossil evidence, came to the southern continents from the north, which, throughout much of geologic history, was an interconnected series of continents. Southern fossil types, then, came from the same place—the north—and did not cross over from one continent to another on land bridges, or drift across the Atlantic on a "footloose" continent.

A NEW RED PIGMENT OF THE LIVER

IT was reported at the recent meeting of the New York Section of the American Chemical Society that a new, and yet unidentified, red pigment, which is a super heavyweight among the body chemicals of the higher animals, has been isolated at Yale University.

The red pigment, having a molecular weight more than 50 times as great as familiar hemoglobin in the blood, was found in a research seeking enzymes in horse liver. Dr. Kurt G. Stern, who reported the discovery, and Dr. R. W. G. Wyckoff, both of Yale, collaborated in the studies. "As far as we can tell," Dr. Stern said, "this red pigment is different from any other substance, from liver or from other sources, yet described." Chemically speaking, the new red pigment—having the enormous molecular weight of 3,000,000 to 4,000,000—has not yet revealed features which would permit its classification among any known class of chemical compounds.

The new substance was found as a by-product of re-

search seeking a pure solution of catalase, an important body enzyme. An air-driven ultra-speed centrifuge, whirling rapidly, was used to separate the liver red pigment from the brown catalase. The pigment is far larger, in its molecular size, than anything previously encountered in the bodies of higher animals. Only the copper-containing blood pigment of invertebrates, known as hemocyanine, may reach similar proportions. The biological function of the red liver pigment is yet obscure. But it is assumed that it is connected with the use of oxygen by the animal body because it can be reduced to a clear, colorless form. The red color, however, appears to be a property of the large molecule itself and not of an impurity. The molecular weight of catalase, the enzyme sought in the original research, was determined by the investigators to be between 250,000 and 300,000, or four times larger than hemoglobin, the respiratory pigment of red blood corpuscles.

INDUSTRIAL CARBON DISULFIDE POISONING

SIX new cases of carbon disulphide poisoning among workers in rayon manufacturing plants are reported in the forthcoming issue of the *Journal* of the American Medical Association. This insidious form of poisoning, wide-spread in Europe, has received little medical attention in the United States, according to Dr. Samuel T. Gordy and Max Trumper, who two and a half years ago urged a federal survey of the rayon industry. Such a survey is now being made.

This country is one of the largest rayon manufacturing countries in the world, having produced 290 million pounds in 1936. Of the 25 rayon factories, with 50,000 employees, now operating in the United States, 19 are viscose plants using carbon disulphide. For every three pounds of rayon produced, one pound of carbon disulphide must be used. In 1936 more than 33 million pounds of carbon disulphide was consumed by one large viscose plant.

The poisoning makes physical and mental invalids of those it attacks. Headache, stomach trouble, muscular cramps, motor palsies, wavy vision, irritability, horrible dreams, hallucinations, primary increase in libido and later diminution and loss of sexual function are some of the manifestations of the poisoning. Women are affected more often than men, the medical literature shows. The poisoning is of both the acute and chronic types. Tolerance is not established or rarely so. On the contrary there is increased susceptibility to poisoning on further exposure. The psychosis may pe permanent, they state. Until the introduction of artificial silk, the rubber industry was the principal origin of disulphide poisoning. That the condition is not more generally known of in the United States is strange. That industrial diseases have not had the study in America that obtains in many European nations where they are reportable and compensable, is a possible explanation. With the application of the new occupational disease compensation laws in many states, it is expected that more will be heard of this insidious poison.

A NEW PROCESS FOR COLOR PHOTOGRAPHY

A NEW color photographic process that would use a layer of differently dyed red blood corpuscles as filters for separating colors in order to record them on film has been patented by Chalmers C. Smith, of Glendale, Calif., and Ray H. Pinker, of Los Angeles.

Use of the corpuscles, the inventors claim, represents an advance over present color photography technique, which uses either a ruled screen or a layer of starch grains to achieve the color separation. Colored motion pictures and still photographs are all made essentially by using one or another means to separate the three primary colors that make up all shades and tints and to record them separately, then put them together again for viewing purposes. Practical development of the process might well mean a fundamental change in the technique of making colored motion pictures used at present. These are made by means of a triple-coated film, one layer with its associated filter being sensitive to one of the primary colors. This process has, however, serious practical limitations. The screen processes are not used in commercial color motion pictures because the starch grains and the rulings show in the enlargement thrown on the screen.

The red blood corpuscles of sheep, .003 millimeter across, are sufficiently small so that when enlarged 240 diameters in being thrown on a screen as in motion picture projection, they would still be less than a millimeter in diameter, a size small enough perhaps not to show. A further advantage claimed for the idea of using a corpuscle screen is that the corpuscles are more translucent than starch grains, cutting down the amount of light required for taking pictures, and are also more regular.

A HYDROPONIC FARM ON WAKE ISLAND

WAKE ISLAND, tiny dot of coral far out in the Pacific, is to be the site of the newest soilless "farm" for growing green vegetables according to the system originated by Dr. W. F. Gericke, of the University of California. With a total surface area of only half an acre, it is expected to supply the table needs of passengers and crews of trans-Pacific clipper planes that use the island as a way station on the long flight.

The "farm" will consist of a series of shallow tanks, now rapidly being installed. These will be filled with water in which mineral fertilizer salts are dissolved in the right concentration to feed green plants. Over the tops of the tanks wire netting will be stretched, on which, supported in sawdust, excelsior, or other suitable material, tomatoes, peas, beans, carrots and other vegetables will grow, drawing their water and mineral nutrients out of the tanks in which their roots will be dangling.

Wake Island will represent the westernmost extension of Dr. Gericke's system of soilless farming, or "hydroponics." Similar set-ups of tanks for growing vegetables and flowers have been established under his supervision at a number of places along the Pacific coast of the United States, and recently the system has been extended to the eastern part of the country. Dr. Gericke has just returned from an inspection visit to hydroponic "farms"

in the East. He states that a number of European governments have expressed lively interest in his method of growing crops without soil.

Extensive experiments have been carried out with a large variety of economic plants, even including a full-sized banana tree. Results indicate that for the present at least profits can not be expected from crops consisting of dry seeds, like wheat and other grains, particularly when these also depend for their value on high protein content. It appears more profitable to raise plants in the fresh vegetable class, which have high water content and are valued mainly for carbohydrates, vitamins, attractive flavor and mineral salts. Tomatoes have thus far proved the most successful of hydroponic crops. The system is used either in greenhouses, or out of doors where the climate of growing season is favorable. In the continuously mild tropical climate of Wake Island, cultivation will be carried on entirely in the open.

ITEMS

THE first recorded case in which the substitution of heavy hydrogen, or deuterium, for ordinary hydrogen in a chemical reaction produces a color change, is reported in the *Journal of Chemical Physics*. Professor Victor K. LaMer and Samuel H. Maron, of Columbia University, describe their color-change experiments which are still in progress. It is well known that the substitution of a deuterium atom (D) for hydrogen atoms (H) in chemical compounds produces a material with different physical characteristics but, until the LaMer-Maron experiments, this change was never observable to the senses. In the tests the change from hydrogen to deuterium atoms produced a light yellow color in a previously clear solution. The chemicals involved in the tests were a solution of proto-nitroethane in heavy water and a compound made of barium, oxygen and deuterium.

SYPHILIS apparently afflicted almost half the Indians in some communities along the Potomac River. Displaying Indian bones marred by disease, before the Anthropological Society of Washington, Dr. T. D. Stewart, of the U. S. National Museum, raises the question: Where did syphilis come from? Prehistoric America has generally been blamed for giving the world this serious malady. Recent archeological discoveries in Maryland warrant reopening the question, and may lead to the opposite verdict, that white men from Europe brought syphilis to America. Possibility that the Maryland and Virginia Indians caught their disease from white men of Jamestown, or other explorers or colonists is pointed out by Dr. Stewart, who finds particularly significant the spreading of the disease through so many Indians in one group. This is the way the disease would spread, and it is curious that supposedly very ancient cases of syphilis in America have been single skeletons, or Indians of uncertain antiquity. Indian bones marked by ravages of syphilis have a characteristic spongy surface, which Dr. Stewart says was caused by inflammation of the covering membrane of the bone.