

## SCIENCE NEWS

*Science Service, Washington, D. C.*THE BRITISH ASSOCIATION FOR THE  
ADVANCEMENT OF SCIENCE*Press Cablegrams by Watson Davis*

A PAIR of intelligent rats who, like Houdini, solved the problem of entering a little box fastened with fourteen latches, all different, were exhibited to the British Association for the Advancement of Science by Professor William McDougall, of Harvard University. Before the eyes of the audience the animals performed the feat, which Professor McDougall said he would have called romantic imagining if it were not actually seen. Inspired by food in the interior of the box the white rats trained by Professor McDougall can with humanlike intelligence turn more than a dozen latches in a few seconds and open the box. Training the rat to open the first latch takes a little time, but they often learn to open the others, although of different patterns, in a few seconds. Professor McDougall said that despite their low intellectual level rats actually achieve an understanding or insight into a problem set for them to solve. But they must put their minds to work; their motions must be intentional, inspired by curiosity. In another demonstration a rat was shown desirable food at the end of a string hanging over the table edge. The animal pulled up the string, paw over paw. But when a celluloid block was substituted for the food, the rat became wise and refused to raise the string.

A proton, the heart of an atom, would look like a porcelain doorknob if we could see it or its sphere of influence, according to Sir Ernest Rutherford, who showed a model of this tiniest of all objects conceived or known. This bit of positive electricity, as minutely small as astronomical distances are large, if measured in centimeters would have its longest diameter expressed as the figure eight preceded by twelve ciphers and a decimal point. Weird things happen in these infinitesimal reaches of the universe, for the law of inverse squares, fundamental to our solar system and all astronomy, breaks down. Yet even the proton is probably not simple but a complex structure, not yet reconciled to the new mechanics of Einstein, Bohr, etc.

Sir Ernest Rutherford still retains his title as the world's champion alchemist, as the result of a report of W. W. Garrett, an Oxford physicist, who repeated the Miethe experiments of transmuting mercury into gold, with conclusively negative results. All precautions against contamination were taken, and Mr. Garrett claims that Miethe, Nagaoka and others who have claimed positive results obtained their minute traces of gold from impurities in the copper electrodes in their apparatus. Sir Ernest, using alpha particles, the world's speediest projectiles, knocked out of sodium other light metals; these results are unquestioned. Thus the ancient dream of making gold out of baser metals still remains unrealized, but still before the eyes of would-be alchemists

there dances tantalizingly the knowledge that Rutherford did really succeed in turning one element into another and different element.

King Tutankhamen used face cream very like the preparations any dame or damsel can buy at the corner drugstore. A. C. Chapman, a London chemist, reported that the Egyptian monarch's cosmetic was simply animal fat, and that his analysis now showed that it had become contaminated with lime salts from the rock container in which it had been stored these many centuries.

Dr. Henry Fairfield Osborn, of the American Museum of Natural History, discussed the origin of species. "The problem of the origin of species has been entirely changed in the last hundred years," said Dr. Osborn. "If Darwin were living to-day he would be foremost in modifying his own opinions, speculations and theories." Such a statement may cause uninformed anti-evolutionists to rejoice, but this would be unjustified. Dr. Osborn emphasized that the evidence in support of evolution is now ten times more striking and voluminous than it was in the time of Darwin. "Species originate through continuous and creative adaptation in either stable or changing conditions of environment." Since Darwin, biology has demonstrated the continuity of the production of one species from another, and it knows the way that species originate; but the causes of the variations in the evolutionary process are still obscure and may even be beyond human solution.

The latest monument in the evolution of man, the Neanderthaloid skull found at Gibraltar a few weeks ago by Miss Daisy E. Garrod, of Oxford University, was exhibited to the assembled scientists. The shattered bones, together with rude stone implements of Mousterian type, were dug up at a depth of ten feet. They are now under examination in an effort to trace the path of migration.

Civilization originated in either Sumeria or Egypt, according to Professor S. Langdon, the archeologist. His opinion is the result of excavations conducted under the joint auspices of the Oxford Museum and the Field Museum of Natural History of Chicago. Excavations at Kish and Jemdet Nasr, ancient Sumerian cities, brought evidence of the great antiquity of Sumerian civilization, including the earliest known monochrome and polychrome painted ware. In Sumeria pictographic tablets, seals and copper objects of many kinds abounded, the oldest of inascertainable antiquity, the most recent ones definitely dated at three thousand years before the Christian era. Evidence shows that both in Sumeria and in Egypt the best art was always produced at the beginning of an era.

C. Leonard Woolley, director of the joint expedition of the British Museum and the University of Pennsylvania Museum, reported the latest results of excavations at Ur of the Chaldees, which figures in the Old Testament as Abraham's home town. In the great temple there he found the soil riddled with vertical terra-cotta drain

pipes, down which the Chaldeans poured libations to the nether gods. In the temple of the deity Bur-Sin the expedition discovered an extraordinarily modern kitchen, with wells, ovens and a cooking range still in serviceable condition.

The Assyrians were among the great scientists of the ancients, according to R. Campbell Thompson. They knew two hundred and fifty drug plants, could make colored glass, anticipated the purple of Cassius, were expert mathematicians, distinguished between the solar and lunar years, and foretold lunar eclipses.

While British archeologists have been cooperating with American colleagues in unearthing the remote past of the older peoples in the cradle of our race, others at home have been using the most ultra-modern means to study the antiquities of their own land. The newest thing in transportation, a huge British troop-carrying airplane seating twenty-five men in addition to a crew of ten, carries archeologists to remote parts of the island to study ancient evidences of the civilizations of Celts, Saxons and other early British peoples. These investigators reported that the outlines of their ancient fields, villages, forts and other works can be seen better from aloft in an airplane than they can from close by on the ground, and airplane photography has added immensely to the knowledge of England's past.

The idea that plants are as alive and sensitive as animals was presented by Sir Jagadis Chunder Bose, Indian botanist. He performed experiments which he claimed showed that plants react to cobra venom, cyanide and other poisons and to stimulants such as ether, chloroform and alkaloids, just like animals. The sensitive plant, he declared, is ten times as sensitive as the human tongue. Sir Jagadis says that the plant-heart that propels its sap is a layer inside the stem, similar to the elongated tubular heart-organ in lower animals, operating by pulsation. He showed an optical sphygmograph recording the "pulse" of a plant magnified ten million times by a reflected light beam. Plants, he claimed, have muscles much like those of human beings and that when tickled these are ordered to contract through the "nerves" of the plant. Sir Jagadis further stated that the stimulations of a plant are coordinated by a special bran-like tissue at the junction of stem and leaf stalk.

The eye of a glowworm was used as a photographic lens to obtain the picture shown by Dr. H. Eltringham. He projected a photograph eight inches in diameter, while the eye-lens that took it had an area of only one fifty thousandth of a square millimeter. Glowworms have perfect sight, Dr. Eltringham said; dragon-flies see extremely well, and butterflies recognize each other at three feet. The favorite color of butterflies is purple, because that is most conspicuous against a green background. Insects also see by ultra-violet light rays which are invisible to human eyes. Such sight is possible because the butterfly's eye, though only the size of a small pinhead, contains five thousand lenses acting upon fifty thousand nerves.

Food famine or shortage lies ahead of the white race unless it resorts to an intensification of agriculture in

areas now under cultivation and to deliberate checks of its own birth rate in the near future, according to Sir Daniel Hall, leading British agricultural expert. Under existing conditions from two to two and one half acres of cultivated land are needed to support each person. The increase of the white population during the last century, an event unprecedented in the history of the world, has been achieved only because vast areas of unoccupied land, chiefly in America, were open to settlement. The present annual increment of the white population, five millions, needs the taking into cultivation of twelve million acres of new land each year, but this is not happening. Instead, the cultivated acreage is decreasing slightly. Little new land is available. The world-wide flight from the land is laid to the small and uncertain returns from agriculture as compared with those from industry. Sir Daniel sees the solution to this problem in the white race insisting on the rising standard of living and in deliberately checking its own fertility. He recognizes that danger lies in the readjustment period. Farmers, he said, must organize cooperatively, or capital must enter agriculture. This intensification, he believes, will occur only when prices rise. An increase in agricultural production is possible only through continued scientific research, improving strains of agricultural plants, producing better and more economical fertilizers, combating insect pests and crop diseases, and in other ways giving agriculture the benefit of advances in pure science. Under stern necessity, Sir Daniel stated, we may eliminate the waste involved in the conversion of potential food into alcoholic drink. Britain annually ferments the produce of a million and a half acres of barley, while France devotes four and one half per cent. of her cultivated area to vineyards. Less than half the potential food value of this produce is thus utilized, but, Sir Daniel added, "I feel that the race—not the individuals—which cuts out meat and alcohol in order to multiply is of a permanent slave type, destined to function like worker bees in the ultimate community."

Man lost his original, ancestral coat of hair through playing with fire, is the theory advanced by Dr. R. T. Gunther. Hairy man was a danger to himself when he learned to make a fire; therefore singeing became customary to remove the perilous pelt under controlled conditions. When the ladies of the tribe saw how much handsomer the males were without a growth of hair all over their bodies they began to prefer thin-haired men for mates, thus weeding out the hairier ones by sexual selection.

Another explanation of the hairlessness of man was given by Professor H. J. Fleure in his address as president of the anthropological section. He called attention to the lengthening of the prenatal life, from two hundred and twenty days for our relatives among the apes, to two hundred and eighty days for man. This lengthening gave time for the prenatal hair, still present on human fetuses, to disappear, and it also allowed a bigger brain to develop. The secretion of the thyroid gland is associated with hair growth, and when hairiness was largely suppressed this energy was diverted to the growth of the

brain, thus contributing to man's evolution. Professor Fleure contended that the Andamanese, Semang, Aeta and Tapiro peoples, who are Asiatic primitives, together with the Akka and other African pigmies, the African bushmen and the extinct Tasmanians, are possible survivals of early types of ancient man.

Dr. Henry Fairfield Osborn, who was the recipient of an honorary degree from Oxford University, announced his theory that the high plateau region of Asia, rather than the traditional Asiatic lowlands, was the home of the vigorous line of the ancestors of dawn man, far back in the age of mammals. He stated that his colleague, Roy Chapman Andrews, found in the Gobi Desert relics of four periods of the Old Stone Age: Eolithic, Acheulian, Azilian and Campignian.

How you can remember what happened when you were six months old was explained by Dr. E. Pickworth Farrow, the well-known English psychologist. Dr. Farrow outlined the process as follows: "Briefly the method consists in writing down absolutely any and every thought which occurs to one for periods of one or two hours at a time and continuing this over a number of periods. What happens is, apparently, that the memories of recent happenings become gradually worked off, and the mind gradually goes back further and further into the remembrance of incidents in one's early life. In very many cases subsequent verification of these circumstances may be obtained from one's parents. The results obtained by this process of self-analysis strongly confirm Professor Freud's results concerning the mode of working of the human mind, except that they rather suggest that Professor Freud may perhaps not have given due or proportionate weight to the egotistic or self-preservative group of instincts. This method of psychological research needs no apparatus of any kind—only patience, a pen and some paper—and thus anybody can follow it and test the ultimate definite recollection of extremely early incidents for himself."

The history of Egypt has been pushed back to a period so remote that by comparison Rameses and King Tut departed this life only yesterday. Dr. K. S. Sandford told how ancient river terraces of the Nile, formed during the days when all of Europe and most of North America were held in the grip of the glaciers, somewhere between a hundred thousand and a quarter of a million years ago, have yielded the rough stone implements used by the low-browed Neanderthal race. Three distinct types of weapons, the Chellean, Acheulean and Mousterian, in three successive terraces, testify to the high antiquity of man in Egypt.

The brown natives of the Pacific Islands were linked with early man in Europe by Professor W. Boyd Dawkins, who called attention to the similarity of their worship of polished stone axes with ax cults in France, Germany and Britain. Polished stone axes have been found, he said, in the monuments of the New Stone Age in Europe; of especial interest is the fact that one was discovered in a burial mound near Stonehenge. The legends of the South Sea peoples all point back to a

voyaging from a mainland far to the west, to which the spirits of their dead are supposed to return. This ax-worship of theirs would indicate that their departure from Asia or Africa must have taken place during or not long after Neolithic times.

Even in freakish and lopsided living things there is a law of order and proportion, which can even be expressed by a mathematical formula. This was the subject of an address by Professor Julian Huxley, one of the foremost British students of evolution and the grandson of the famous Thomas Henry Huxley, friend and champion of Darwin. According to Professor Huxley, the parts or organs of an animal always preserve the same ratio to the whole body in size or weight, no matter whether the animal grows large or remains stunted and small. This holds for animals of normal or conventional proportions, but even more strikingly so for those with an over-developed organ or part. For instance, the same relation holds between body-weight and antler-weight in the deer as holds between body-weight and claw-weight in the fiddler crab.

Where did Sir Arnold Theiler's cows get their vitamins? These semi-mysterious substances, which have recently come to be regarded as absolutely necessary for the maintenance of animal health, were left entirely out of the ration of a number of heifers during a series of experiments, yet the animals thrived as well as others kept on a normal feed, so long as they got an adequate supply of phosphorus. Sir Arnold propounded the riddle, but did not undertake to answer it.

Oxidation usually weakens a metal, but Dr. G. D. Bengough and H. Sutton have a process of electrically coating aluminum with a thin layer of its own oxide or hydroxide which they state is of great assistance in keeping it from corroding. The rapid corrosion of aluminum, the lightest of the stronger metals, has been the greatest drawback to its use in airplanes, especially in planes exposed to salt sea water; and it is expected that the new process will be of great importance in the development of the aircraft industry.

## ITEMS

How to make America a healthier nation mentally is being discussed from many angles by the American Psychiatric Association at its recent New York City meeting. Psychiatrists from all over the United States attended the meeting. The early sessions brought out the fact that it is uncertain whether or not mental disease is actually increasing in this country. The difficulty of obtaining statistics and of interpreting case histories for statistical purposes was stressed by Dr. Henry B. Elkind, of Boston. Among the subjects attracting interest at the sessions were the therapeutic value of music in mental and nervous diseases; the importance of environment in the early careers of delinquent children; and what to do with psychopathic individuals who play so important a part in America's "crime wave."