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THE MEMPHIS MEETING OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY

PAPERS presented at the Memphis meeting of the Federation of American Societies for Experimental Biology include the following:

Dr. Leo Loeb, of Washington University, discussed the recognition of one body cell by another by chemical means. "Individuality differentials" is the term used to describe the means by which cells make their identification. It is by these chemical differentials that cells know, in case of skin grafting, for example, whether the new skin comes from another part of the patient's body or from a relative's body or from a stranger. If, instead of skin, some other tissue is transplanted, the cells also recognize whether it comes from the same individual or from a different individual; but the cells do not distinguish between liver, thyroid or other organs; they are not concerned with the difference between organs, but only with differences between "individuality differentials." If a gland is transplanted from a rabbit to a guinea-pig, the cells in the surrounding tissues of the guinea-pig can tell that it does not belong to their own species. If the grafted gland came from a guinea-pig, the cells recognize the transplant as belonging to the same species, although to a different individual, and if the graft was from a litter mate the fraternal relationship is recognized by the cells. All this is possible because certain chemical substances are produced by the body and are present in each piece of tissue. These substances are given off by the tissue if it is transplanted; they first spread into the area surrounding the graft and then into the bloodstream and thus are carried to distant organs of the body. It is these substances which enable the cells to recognize whether the graft was part of their own body, of that of a relation, of a non-related individual or of an individual belonging to a different species. This chemical personality or individuality is highly important. It protects the body because it gives the cells power to recognize alien and possibly hostile cells. It also is evident when attempts are made to graft skin or other tissue from one individual to another individual of the same species or from one species to another. The grafts "do not take," it is said, but the reason is that the cells of the recipient have recognized the foreigner and they as well as the blood are reacting against him.

FROM a survey of brain-wave research reported by Dr. Hallowell Davis, of Harvard University, it appears that each person has his own individual brain-wave pattern, but for purposes of identification these patterns are not as good as finger-print patterns. The brain waves, which are electrical waves continuously generated by the gray matter of the brain and spinal cord, represent the organized activity of many cells. In some cases the organization is due to the fact that many brain cells are simultaneously stimulated by incoming impulses from the sensory nerves. A bright light striking the nerves of sight, for example, sends in the impulses which stimulate brain cells to produce an electrical wave. Electrical waves are produced by the brain cells as a result of other stimulation, such as acute injury and certain drugs. The character of brain waves varies according to the kind of physiological activity going on in the brain. Very slow and often irregular activity occurs during sleep, anesthesia, coma and fainting. Epilepsy and brain tumors each cause definite types of brain-cell activity as seen in the brain-wave patterns. Diagnosis of such brain ails, it is hoped, may some day be made from the brain wave patterns. In normal persons the pattern of electrical activity in the brain is characteristic. Identical twins have practically identical patterns, although ordinary twins and other persons each have their own individual patterns.

EPILEPTIC attacks might be prevented if the patient's breathing could be regulated to an even rate of inhaling and exhaling, it appears from research reported by Dr. Frederic A. Gibbs, of the Harvard Medical School. This is because the stop and go system which regulates the breathing movements also affects the rate of brain-cell activity. The brain-cell activity generates rhythmical electrical waves, popularly called brain waves. A record of these brain waves is, except for the time scale, very much like the record of breathing movements. When breathing is slow, the brain waves are slowed, and the reverse. Measures which correct disturbances of the breathing rate tend to correct and prevent the comparable disturbances in brain-wave frequency which occur in epilepsy. Conditions which cause sudden changes in breathing rate because of their effect on brain-wave frequency bring on epileptic seizures.

DRS. J. REBOUL, H. B. Friedgood and H. Davis, of the Harvard Medical School, reported their experimental method of detecting the moment of ovulation in the rabbit by electrical means. When the egg cell bursts from its sac in the ovary a characteristic electrical change occurs. This was detected by means of a vacuum-tube potentiometer activating a moving-coil galvanometer. The research confirms earlier work reported by Professor H. S. Burr and associates, of Yale University. What gives the signal for the egg's escape from the ovary is not known exactly, but a hormone from the pituitary gland plays a part. Drs. H. O. Haterius and A. J. Derbyshire, Jr., of the Ohio State University reported that the process has now been induced in rabbits by electrically stimulating a definite area of the brain. The region is localized and is situated in the part of the brain called the hypothalamus, to which the pituitary gland is attached. It is probably directly above and behind the optic chiasma, which is where the fibers of the optic nerve cross on the underside of the brain. Ovulation occurs after stimulation of this particular region of the brain, but Drs. Haterius and Derbyshire stated that there is as yet no evidence that ovulation occurs because of the stimulation.

THAT one of the male sex hormones, testosterone, may be a valuable remedy for prostate gland disease, was suggested by Dr. Harold P. Rusch, of the University of Wisconsin Medical School. The hormone may undo some of the damage done in the disease. Recent research has shown that certain changes of the gland tissue are the result of a relative decrease of male hormone in relation to the amount of female hormone present in the male body. Changing these proportions of male to female hormone by giving female hormone to mice caused changes in their prostate glands similar to those seen in man. In the experiments reported, Dr. Rusch was able to reverse some of the changes by giving male sex hormones to the animals.

THE cause of angina pectoris is laid to stomach spasms, in a new theory reported by Drs. D. E. Jackson, Russell N. Speckman and Helen L. Jackson, of the Medical School of the University of Cincinnati. In their opinion "angina pectoris is really due to acute, spasmodic, incoordinated contractions of the esophagus or stomach or of both simultaneously." As a result of these contractions air or other stomach contents may be entrapped in the esophagus. Complete rupture of the organ, usually the lower end of the esophagus, has occurred in a considerable number of these cases. X-ray studies often make it possible to see these contractions, bulgings and other abnormal conditions in the esophagus. The location of these abnormalities has a direct bearing on the distribution of the pain of which the patient complains. Nitrites, stand-by medicines for patients with angina pectoris, relieve these patients by relaxing the smooth muscle of the esophagus or stomach. If the drug, which acts only locally, does not reach these muscle fibers in sufficient concentration, relief may not occur. Angina pectoris has been one of the unsolved mysteries of medicine for nearly 170 years. Some 80 different theories have been proposed to explain this painful and often fatal affliction.

EXTRACT of the cortex of the adrenal glands may be part of the athletic trainer's equipment in future, if the suggestion seen in a report by Drs. Fred A. Hitchcock and R. C. Grubbs, the Ohio State University, can be acted on. This gland extract tends to increase the muscular efficiency of normal men and women. Its effect is seen in the decreased consumption of oxygen by normal persons when performing muscular work. Large doses of the extract were required to produce this effect. The extract, cortin, has been known chiefly for its life-saving power in cases of Addison's disease, in which the cortex of the adrenal glands has been injured or destroyed. Like insulin in diabetes, cortin keeps Addison's disease patients alive by making up for the deficiency of cortin produced by their own sick glands.

SURGEONS who try to relieve extremely high blood pressure by cutting the nerves from the adrenal gland may be on the wrong track, it appears from research reported by Drs. Lester R. Dragstedt, John van Prohaska and Herman P. Harms, of the University of Chicago. The theory back of these operations is that adrenalin, or epinephrine, as it is also called, in excessive amounts is the cause of the high blood pressure. Therefore cutting the nerves of the epinephrine-producing adrenal glands should relieve the condition. Testing this theory, epinephrine was given continuously for 15 days to normal dogs. This kept the blood pressure high, but the majority of the animals died, not of the high blood pressure, but with symptoms that suggested disturbance of the digestive tract. Excessive epinephrine, the scientists conclude, may produce a moderately long-continued high blood pressure, but the amount required to give this effect is enough to produce other, usually fatal, effects on the system, which looks as if the operation would be unsuccessful because it is based on a wrong theory of the cause of the condition.

THAT the kind of breathing known as Cheyne-Stokes respiration, characterized by rhythmical variations in intensity and usually seen in coma due to nerve center disease or shortly before death, can be converted to a regular rhythm by improving blood circulation through the brain was reported by Drs. W. D. Paul, James A. Greene and A. E. Feller, of the State University of Iowa. From their results it is suggested that improper circulation of blood to the brain is an important factor in producing periodic breathing.

THE cause of one of the sudden and mysterious diminutions in wild life which disturb naturalists and hunters alike has been found by Drs. R. G. Green and C. L. Larson, of the University of Minnesota and the Bureau of Biological Survey, Minneapolis. Shock disease of wild snowshoe hares is a condition characterized by such low blood sugar level that the animals die within a few hours after the first appearance of symptoms. The condition probably affects the animals much as an overdose of insulin affects a diabetic patient. The disease comes on in 10-year periods, causing a marked reduction in number of the animals. Further study of the hares showed that the cause of the trouble was a degenerative condition of the liver cells.

FROM being known as a single vitamin that prevented a serious nervous disease, beriberi, seen only in Oriental countries, vitamin B has become a complex of many vitamins, some of them still little understood even by scientists who make a special study of the subject. Thirteen reports on different phases of vitamin B were made at the closing session of the meeting. One of the new B vitamins is now named W and another is known as H. There are about 6 that still go by the family name of B, and others which are called flavins. New diseases due to lack of one or another of these B vitamins are also being discovered. One of these, an anemia, was described by Drs. Albert G. Hogan, Luther R. Richardson and Paul E. Johnson, of the University of Missouri.

DR. WILLIAM C. ROSE, of the University of Illinois, reported on the minimum quantity of various essential proteins to normal nutrition. It was found that for every hundred parts of food there must be 0.6 parts of threonine, 0.5 parts of isoleucine, 0.7 parts of phenylalanine, 0.6 parts of methionine, 0.4 parts of histidine and 1 part of lysine.