SCIENCE NEWS

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SOME PAPERS PRESENTED AT THE PHILADELPHIA MEETING

From press telegraphic reports.

MEMORIES in rats after operations on the brain have been studied by Dr. K. S. Lashley, of the Institute for Juvenile Research, Chicago, and were reported to the American Psychological Association. Many of our universities in recent years have added departments of rodent-education in which the course is that branch of activity in which rats have shown themselves proficient in all ages, that is, finding their way through tortuous passages. The rat to be trained is put into one corner of an artificial maze and set to find his way to his food in some other compartment. When he is able to run rapidly through the passages without hesitation, turning into a blind alley, he is credited with having learned his lesson. Dr. Lashley has discovered that this acquired proficiency can be eradicated by cutting out certain parts of the brain, particularly in the parietal region. The larger the area injured the greater is the number of trials required for relearning the lost lesson. When the cerebral lesion is extensive more practice is necessary for relearning the maze than for learning it at first, but other and simpler habits are formed as quickly as ever. The investigator concluded that the maze habit is relatively independent of the activity of specific neurons, but somehow depends upon the massed activity of the greater part of the brain. Obviously such studies of the localization of various forms of cerebral action in rats may throw light upon the cause and cure of mental diseases in man.

IS it a masculine trait to be abrupt and outspoken, and is it feminine to be vain of one's personal appearance? If a man is vain is he feminine to that extent, and if a woman is abrupt in manner is she more masculine than the average individual of her sex? Such questions as this on sex differences may be answered, when a series of tests now being conducted at Stanford University is completed. Dr. Lewis Terman, who has just reported progress of the investigation to the American Psychological Association, states that very little is now known as to the differences between sexes in abilities, talents and character. The investigators aim to find out where the differences really lie, and how they may be measured. Definite information may settle the age-old controversy of whether the extremely masculine type and the clinging-vine feminine type really make the best matrimonial combination, the psychologist suggested. Tests so far given indicate that popular ideas as to what a boy or girl is interested in are often far from accurate. It was hardly expected, Dr. Terman said, that females would excel males in liking civics as a study, or in their interest in public speaking. Nor was it expected that the boys would excel the girls in knowing what the Mona Lisa refers to, and in telling what kind of costume the Colonial Quakers wore. But such is the case, the tests show.

A PIECE of the mineral molybdenite, one of the chief sources of the metal molybdenum, used in steel manufacture, may replace the fragile photoelectric cell in some forms of scientific work, Dr. W. W. Coblentz, of the U. S. Bureau of Standards, told the American Astronomical Society. Dr. Coblentz has been studying what he calls the antinoelectric effect of molybdenite, the property that causes it to convert light energy falling on it into electrical energy. Previously he found that pieces of the mineral have closely adjacent spots which generate either positive or negative electricity. The result is that when the whole crystal is exposed to light the positive and negative currents neutralize each other, and very little effect is noted, but if a single one of the spots is selected and illuminated, a current is produced of sufficient intensity to be indicated with a galvanometer. Very recently, however, Dr. Coblentz has found crystals in which all the sensitive spots give the same kind of electricity, either positive or negative. When one of these crystals is completely illuminated, a considerable current, as compared with the others, is produced. By using vacuum tube amplifiers, such as are used in radio, the current may be magnified greatly and the crystal made available as a delicate detector of light. Such a crystal is sensitive to the visible light waves and to the infra red, or heat waves, which are similar, but vibrating too slowly to be visible.

THE suggestion that the earth can not be relied upon to stay the same size, but that it swells and shrinks at irregular intervals was made by Dr. Walter D. Lambert, of the U. S. Coast and Geodetic Survey. Such a variation in the size of the earth would alter its rate of rotation and so upset our universal time-piece, for the length of day is our measure of the lapse of time. Professor E. W. Brown has pointed out that such a variation in our unit of time might account for the apparent irregularities in the motion of the moon that have made it impossible to predict exactly where our inconstant satellite will turn up at an eclipse. Dr. Lambert thinks it may also account for inexplicable variations in latitude or what is the same thing, the apparent wandering of the pole. For some years prior to 1918 the north pole appears to have moved progressively toward North America and then to have turned aside without apparent reason and moved toward Europe. Comparatively slight expansion and contraction of various parts of the earth's surface might account for such disconcerting discrepancies in our standards of time and space.

PEOPLE who failed to get sufficiently sunburned last summer may have hopes for next summer, because the activity of the sun, as measured by the sun-spot cycle, is still increasing and will probably continue to do so

until the end of 1927 or the beginning of 1928, according to Miss Hazel M. Losh, of the Mt. Wilson Observatory, California, who reported researches made jointly with Dr. Seth B. Nicholson. Sun spots were at a minimum in 1923 and since then they have been increasing in number. During the last few months the solar activity has been about as great as in 1917, when the last maximum occurred. But there is this difference. In 1917 the spots were near the equator of the sun, as they always are when the cycle has reached its height. This fall the spots, though numerous, have beeen nearer the poles of the sun than in 1917, and this indicates, it was said, that the maximum has not yet been reached. If the maximum comes about a year from now the sun-spot period will be only about ten years long, a year shorter than the normal period.

SUCH a variation in sun-spot cycle may have occurred in the past, Dr. A. E. Douglass, of the University of Arizona, told the astronomers. His researches show a relation between tree rings and sun activity. From 1748 to 1788, for example, his studies of trees show that there were four cycles of ten years each, while in the following forty-two years there were only three cycles of fourteen years each. Dr. Douglass's studies are based on the fact that the tree rings, which represent growth of a tree during the year, vary in thickness with the amount of moisture that they receive during the growing season, and that rainfall varies with the sunspots. So by studying old trees, such as the giant sequoias, in California, and other old trees in Arizona, the past activity of the sun may be traced.

A SOVIET scientist, Professor A. Tchijevsky, of Moscow, says that important historical events have a tendency to occur at eleven-year intervals which very closely coincide with the rise and decline of spots on the sun. The ideas of the Russian archeologist were explained to the American Meteorological Society by Dr. V. P. De Smitt, of Columbia University. In support of these ideas, Dr. De Smitt displayed a chart where one curve represented the number of sunspots from 1749 to 1923, and the other "universal human military-political activity," the two curves closely paralleling each other. A sunspot maximum in 1780 coincided with the height of the American revolution, one in 1848 coincided with revolutionary activity in Europe, one in 1870 with the Franco-Prussian war, and one in 1917 with the great war and the Russian revolution. "The maximum of sunspot activity," said Dr. De Smitt in summarizing Dr. Tchijevsky's views, "favors the excitability and uniting of the masses for attaining a certain general necessity brought forward by economic or other causes, and brings forth mass actions and leaders. But these acts are not inevitable; all depends upon previous events. For example: if a war is already in progress from the previous period, the general excitement may assume the form of ardor for peace at any price."

DR. OSCAR RIDDLE, of the Carnegie Institution for Experimental Evolution at Cold Spring Harbor, Long Island, N. Y., who will be remembered as the scientist who discovered mamma pigeons that had changed into papa pigeons, declared that "sexuality rests initially on metabolism." Using a blood test for sex that was devised by a Russian, Dr. E. O. Manoilov, it was found by Dr. Riddle that when the father pigeon is engaged in incubating the eggs during the daytimes of the nesting period, his blood gives the test for femaleness in a large number of cases. This is because during this period the male is relatively inactive, a condition that is a feminine attribute. Determinations of the speed of living of the two sexes show that the male normally burns up his food into energy faster than the female. Similar studies by other workers at Cold Spring Harbor have shown that plants show with age greater sex differentiation. The Manoilov test applied to plants and trees demonstrated that the young and blooming plants have less sex differentiation than those that have passed into the decline of their existence when their leaves have begun to turn yellow.

A LIVELY discussion among the anthropologists was precipitated by the recent announcement of Dr. Paul Rivet, of France, which, if accepted, would force scientists to revise all their ideas about the earliest inhabitants of America. Dr. Rivet believes he has evidence on the languages of the Malays, Polynesians, Melanesians and even Australians indicating that they were related to the Indians of America. This theory which would imply that long-distance sea voyages were taken by these early races was attacked by Dr. Truman Michelson, of the Bureau of American Ethnology, who has just completed a study of Dr. Rivet's evidence and who pronounced the few similarities found between the words of the islanders and the Indian to be only chance likenesses. Professor Roland Dixon, Harvard anthropologist, declared that the French scientist's material is sufficiently important so that it deserves serious consideration, but, he added, "I am by no means sure that he is right." Professor Dixon pointed out that the Hokan Indians of the west coast and the Melanesians are still very little understood, and that basic study of these peoples is needed before connections of early Americans with other races can be determined. Dr. J. R. Swanton, of the Bureau of American Ethnology, expressed the opinion that a great many more languages are related than we now realize. But he stated that he has found not the slightest positive evidence of relationship between the language of American Indians and the speech of Australian or Polynesian tribes.

THE heart beats of plants which Sir Jagadis Chunder Bose claims he has demonstrated are mere figments of a romantic Oriental imagination, unsupported by any genuine scientific fact, according to Dr. D. T. MacDougal, of the Carnegie Institution of Washington. Together with Professor J. B. Overton, of the University of Wisconsin, Dr. MacDougal discussed the problems of the uphill flow of water in trees, and took occasion to criticize the statements of the Indian savant in the sharpest terms. "An examination of the assertions of Sir J. C. Bose that sap is pumped upward by pulsating action of living cortical cells has been made," he stated. "Bose's

claims as to the rate and mechanism of sap movements ignore well-established anatomical and mechanical facts, and are based upon imagined, but impossible hydrostatic action of living cells. No single direct observation nor any measure of pulsatory action has even been made, by Bose or any one else, yet an explanation of the ascent of sap is based on such an idea.'' After characterizing Bose's claim of a rate of pumping which would take a drop of water through the plant's tissues at the rate of from two to four hundred living cells a second as ''too fantastic for serious comment,'' Dr. MacDougal continued: ''When Bose's suggestion that these pulsations may be the result of stimulation by friction of the roots with soil particles it is realized that the passage from pseudo-research to infantile fancies is an easy one.''

WAKING up plants with narcotics is the latest novelty in agriculture. That small doses of ether or chloroform would stimulate plants has been known for some time and now R. B. Harvey and his associates at the University of Minnesota have found that the newer anesthetics, ethylene and propylene, are still more effective. In experiments described before the American Society of Plant Physiologists they showed that the sprouting of certain varieties of potatoes could be speeded up by putting them previously to planting in an atmosphere of one of these gases in the proportion of one to a thousand. Gladiolus was also hastened. Cuttings of apple, cherry, pear, grape, currants and other trees and bushes, seeds and bulbs of various sorts, broke their dormancy on inhalation of the gas. Bananas, grape fruit, avocadoes, tomatoes, dates and other fruits ripen more rapidly. Pineapples gain in their digestive juice and persimmons lose their astringency. By this means it may be possible to ripen fruit only three fourths grown in a day or so in order to meet the early market or save it from loss when frosted. Propylene is even better than ethylene, but is not yet on sale.

HOW to make our forests more efficient is the aim of the novel investigations carried on in the Rocky Mountain Forest Experiment Station at Colorado Springs by C. G. Bates and J. Roeser. By growing seedlings of various kinds of evergreen trees on a table under the light of tungsten-filament blue-glass lamp for ten hours a day for nine months they determined the limit of light essential for the development of each kind of tree. They found that some species were five times more efficient than others at trapping the roving rays and utilizing their energy for construction purposes. The California redwood ranked first in efficiency as light-catcher for it could keep alive with less than four fifths of one per cent. full noon sunshine. Engelmann spruce and Douglas fir ranked next with one and a quarter per cent. Most of the pines require two to three per cent. while the scrubby pinon of the Colorado foothills failed to flourish with even thirteen per cent. of sunlight intensity. This accounts for the phenomenal ability of the redwood and spruce to make rapid growth in shade of deep timberland and shows why they have outstripped many other trees in evolutionary development. He concludes: ''Broadly speaking we can not afford to give space in the forest to a species which is relatively inefficient in photosynthesis, unless it is producing a wood of exceptional technical value.''

A CHEMICAL method of determining the character of a person was explained by Dr. Gilbert J. Rich, psychologist of the Chicago Institute for Juvenile Research. He finds that the type of temperament is somehow correlated with the composition of the bodily fluids. Good-nature, excitability, aggressiveness and leadership were the traits of personality considered in experiments on university graduates and undergraduates and children. They were ranked according to these traits by those who knew them well and chemical analyses made of their saliva, blood and urine. It had been previously shown that various types of insanity could be distinguished by such tests, and Dr. Rich's results indicate that they may also be of use in analyzing the character of normal individuals.

THE old question, which used to be so hotly discussed by theologians and philosophers, of whether the earth is in the center of the universe is decided by Frederick H. Seares, of Mount Wilson Observatory, in the negative, by his measurements of the distribution of stars in various directions. He finds that our solar system is about 4,000 light years, or twenty-four thousand million million miles, from the center of the watch-shaped cluster of some thirty billion stars which we call the Milky Way.

HOW the same figures, by a simple movement of the decimal point, can express the vast distance of a star from the earth and the minute distance between two atoms in a pinch of salt was explained by Professor Alexander McAdie, of Harvard University, as an argument for the metric system of weights and measures. Expressed in meters, the distance between salt atoms is 281 with a decimal point and nine ciphers in front of it. Move the decimal point 28 places to the right and there results the number of meters that a star, distant 300 light years, is from the earth.

PROVING that freaks of nature, such as four-legged chickens and two-headed calves, have scientific as well as popular interest, Dr. F. E. Chidester, of West Virginia University, reported upon the anatomy of such malformed creatures. One chicken examined had four wings as well as four legs. Although the kidneys were doubled in some cases, the gizzard, heart and respiratory apparatus remained single.

DISSECTION and microscopic study of two Peruvian mummies dating back to about 700 A. D. revealed examples of red blood corpuscles, quite fragile structures to have survived so long a time, it was reported by Dr. Herbert U. Williams, of the University of Buffalo. Dr. Williams also found by dissection arteries, nerves, muscles and tendons which could be readily identified. His findings, he stated, indicate that much could be done by study of such mummies to determine the diseases of early American races, especially diseases of the chest and abdomen.