PHYSIOLOGY

Effects of Electric Shock On Rats are Determined

IF A 1000-volt electric current passes through the body of a rat between his front leg and his tail, he has almost an even chance to recover. But if the path of the current is from front leg to hind leg, he is pretty sure to succumb. This difference in effect was discovered by W. B. Kouwenhoven and O. R. Langworthy of the Johns Hopkins University. It is explained by them, in a report to the American Institute of Electrical Engineers, on the ground that a current flowing from front leg to hind leg finds less bodily resistance than in the other case, and, as a result, becomes high enough to cause death.

In the course of the experiments the conclusion was reached that a continuous current is much more dangerous to rats than an alternating one of the same voltage. Burning of tissues was reported as being more severe when produced by a continuous current.

Points of electrical contact on the rats were varied purposely. A current passing from one fore leg to the other was found to be fatal in every case, while a current from hind leg to hind leg produced only temporary disability. It was also discovered that injury caused by the current going from left fore leg to tail was less severe than that caused by the same current flowing from right fore leg to tail.

According to experimenters, the conclusion made by another investigator that an electric current passing through the brain stops the breathing process for a time, was confirmed. It was also found that the brain cells can be fatally injured by an electric current. When vital organs were not in the current's path the effects were not serious.

Science News Letter, October 17, 1931

ENTOMOLOGY

Maternal Cares Multiply With Coming of Cold

See Front Cover

WINTER has breathed a hint of its coming already, in puffs of frosty air that make us forget the heats of summer that is gone, even of the unseasonable hot spell of early September. But the coming of the cold bodes only ill for the cold-blooded creatures of field and forest. They have but two alternatives: to die, leaving eggs, larvae or pupae in safe places to carry on the life of the species next year; or to endure the cold and drought in the death-like slumber of hibernation.

Spiders take both courses. Some species leave their egg-balls hidden in crevices or suspended in webs, and crawl away to die. Others drag their eggs-balls with them and hibernate, mother and unhatched young sharing the same hiding places. Thus one will see, every autumn, spiders dragging their thousand-fold cradles with them.

The particular specimen shown on the cover, is a close-up of one of the fiercest and most formidable of the hunting spiders, a member of the large genus *Lycosa,* better known as the wolf spiders. This one was photographed in an attitude of jealous maternal watchfulness by Cornelia Clarke.

Science News Letter, October 17, 1931

ETHNOLOGY

Prehistoric Americans Had Well-Balanced Diet

PREHISTORIC MAN in southwestern Colorado had a fairly well-balanced diet, is the conclusion of Dr. Dwight W. Rife, official physician at Mesa Verde National Park during the past season.

Dr. Rife has arrived at this conclusion after studying the kitchen middens and refuse heaps of the early cliff dwellers, their food caches, and existing plants and animals of the region.

The typical Indian cliff dweller was a sedentary agriculturist and occasional hunter and had yellow corn for his main article of diet. Recent studies of yellow corn, Dr. Rife states, show that it contains, in addition to necessary food elements, the important vitamin A in abundance.

The Indians also ate the fruit of the yucca, and possibly a paste made of its seeds. They ate berries, seeds of certain grasses which when dried and ground made a mealy paste for their primitive hot cakes, beans in large quantities, squashes and edible gourds. They harvested pinon nuts to eat through the winter, and also the roots and shoots of various plants, such as the bulbs of the sago or Mariposa lily.

Wild game these early Indians had in abundance. Venison, mountain sheep, rabbits, and perhaps game birds fell to the hunter's arrow.

Primitive man needed salt for seasoning, as we do today.

Science News Letter, October 17, 1931

IN SCIEN

VITAL STATISTICS

Accidents Leading Cause Of Death Among Children

ACCIDENTS, tuberculosis, heart diseases, pneumonia, diphtheria and appendicitis are the six most important causes of death among school children between the ages of five and nineteen years, Selwyn D. Collins of the U. S. Public Health Service has just reported as the result of a special study of mortality records of the U. S. Census Bureau.

"Accident is easily the leading cause of death, and automobile accidents constitute about one-third of the total accidental deaths," his report on the mortality of school children stated.

The death rate for girls between the ages of five and nineteen was less than for boys of the same age group.

An encouraging decrease was found in deaths from all causes at these ages from 1900 to 1927.

"Considering all causes of death, the age group ten to fourteen has the lowest mortality not only for the school ages but for any age throughout life," Mr. Collins reported.

Science News Letter, October 17, 1931

CHEMISTRY

Heat Waves Show Water Molecules Form in Clumps

NEW EVIDENCE that liquid water molecules form in clumps of two or more has been presented by Prof. Joseph W. Ellis of the University of California at Los Angeles.

The new evidence comes from the way in which infrared or heat rays are absorbed by water. Certain new bands or dark patches observed in the infrared spectrum favor the theory that the simple chemical units of two hydrogen and one oxygen atoms are probably linked in groups or even form a lattice-like structure.

This theory has not been in favor with chemists recently. However, some phenomena observed during the formation of ice lend considerable weight to the idea.

Science News Letter, October 17, 1931

CE FIELDS

PHYSICS

Best Vacuum Known Only Relatively Air Free

HOW BADLY does nature abhor a vacuum? Scientists of the Bell Telephone Laboratories have recently perfected a method of measuring the best vacuum known to science and thus answered this question.

Dr. Edwin K. Jaycox and Dr. H. W. Weinhart, using an ionization manometer of new design, have found that when they have pumped out the last remaining traces of air from a vessel there are still left some 500 million molecules in every cubic inch. This seems a lot but it is, in fact, only one three-trillionth of the original amount of air.

The attainment and measurement of the best vacuum has become increasingly important now that photoelectric and other vacuum cells have become of such importance in industry. The emission of electrons from a metal surface, on which these devices depend, is very much hindered by the presence of even the smallest amounts of gas.

The ionization manometer used in this work is similar in construction to the familiar kenotron or radio tube. Electrons are produced by a hot filament and pulled towards a plate by a positive voltage. On the way towards the plate they strike any gas particles that happen to be in the way and give them a positive charge. The positive ions thus formed are drawn off by another electrode and used to measure the extent of the vacuum.

Science News Letter, October 17, 1931

ENGINEERING

Motor Car Requires Best In Practical Illumination

THE MOTOR CAR is a creation of light. Not that blazing lamps or the sun's rays will alone turn out a sport model, but as few people realize, automobile production requires the ultimate in practical illumination.

All the way from the foundry to the point of finished bodies, light of particular intensity and character plays a vital part. In one of the principal auto manufacturing companies of Detroit, a report in the *Electrical World* tells, light intensities varying from 8 to 140 foot-candles are employed. Lights of 20 foot-candle power are used most on the average.

Normal daylight, because of its variability, is not sufficient. To supplement it, about 3,000 mercury-vapor lamps lend their light in the manufacturing company surveyed, and 25,000 ordinary incandescent lamps. Both types together illuminate the entire area of the plant, three million and a quarter square feet. Even the finished product demands plenty of light, as a nocturnal inspection of any fashionable display room will prove.

Science News Letter, October 17, 1931

PUBLIC HEALTH

Pupils Absent from School Thirteen Days Annually

THE American school child is absent on the average of 13 days per school year and more than half of these days lost are due to sickness, a survey just completed by the U. S. Public Health Service shows.

The survey was made among school children in Hagerstown, Md., in some towns in Missouri, and in Pinellas and Orange Counties, Fla. It is believed that the data collected from these localities fairly represent the extent and character of the illness and physical defects that are commonly found in school groups.

The six diseases causing the most cases of illness among these school children were, in order of importance, colds, headaches, digestive disorders, tonsillitis and sore throat, toothache, and influenza and grippe. The six that were most important in terms of days lost per child per school year were colds, influenza and grippe, tonsillitis and sore throat, measles, mumps and digestive disorders.

Girls were sick oftener and lost more days per year than boys.

Another fact brought out in the survey was that three-fourths of the children examined in a group of localities had one or more physical defects other than defective teeth, vision or hearing. The defects most frequently noted in physical examinations were decayed teeth, defective vision, defective tonsils, enlarged glands in the neck, excessive wax in ears and thyroid gland enlarged.

Fewer girls than boys had physical defects.

Science News Letter, October 17, 1931

ZOOLOGY

Eagle Takes Bobcat for Aerial Ride and Drops Him

AN EAGLE that has proved its ability to "lick its weight in wildcats" is the boast of Mesa Verde National Park. And the dead wildcat is there to prove it.

Superintendent Marshall Finnan tells the story. A roadbuilding crew of Navajo Indians were startled to see a big eagle swoop down upon a full-grown bobcat, and carry its yowling, spitting prey high into the air. At a height of about 1,800 feet the eagle let go, and the cat crashed down upon the highway, dead.

The Indians rushed to retrieve the wildcat, and at the same time the eagle swooped again, making several attempts to regain possession of its prey. Another party of Indians on the roadway above the scene began to throw rocks at the bird to drive it away. This they succeeded in doing, but unfortunately one of the missiles struck another worker on the head hard enough to put him in the hospital for several days.

Now the mounted skin of the wildcat, with the scars of the eagle's talons plainly visible, stands on top of a case in the Park museum.

Science News Letter, October 17, 1931

PHYSIOLOGY

Effect of Environment On Growth Rate is Short

THE INFLUENCE of environment on the growth rates of children is effective for a short period only, it appears from a report of Dr. Leonard Findlay of the East London Hospital for Children at Shadwell to the Congress of the Royal Sanitary Institute at Glasgow.

Whatever the nature of the special factor or factors in environment which exert their influence for good or ill, they appear to be active only during a comparatively short period of the child's life, Dr. Findlay said.

He compared the growth of city and country children of the same social class. Between the ages of six and eighteen months, the city child grew more slowly than the country child, but after this age he grew more quickly than the country child. However, he never grew at a sufficient rate to make up for the delay during infancy.

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