

PHYSICS

**Silk Belt Gathers
Huge Electric Charge**

CHARGES of electricity in 10,000-volt groups are carried up a moving endless silk belt until they have accumulated a potential of 1,500,000 volts on two-foot copper spheres, in a new type of apparatus for exploring the heart of matter which was reported to the American Physical Society by Robert J. Van De Graaff, National Research Fellow, Princeton University.

While potentials of more than a million volts have been built up in the past by different kinds of generators, the construction of this apparatus is unique.

"The generator has the basic advantage of supplying a direct, steady potential," Dr. Van De Graaff said, "thus eliminating certain difficulties inherent in the application of non-steady high potentials. It is simple, inexpensive and portable. An ordinary lamp socket furnishes the only power needed."

Two hollow copper spheres, each 24 inches in diameter, mounted on seven-foot glass rods, accumulate the high tension charges of electricity in each of two identical units, one unit accumulating positive electricity and the other negative. In each unit an endless silk belt runs between a pulley near the ground end of the glass rod and a wheel in the sphere.

"The ascending surface of the belt is charged near the lower pulley by a brush discharge," Dr. Van De Graaff explained. "The charge is maintained by a 10,000-volt transformer kenotron set, and is subsequently discharged by points inside the sphere."

Science News Letter, September 19, 1931

CHEMISTRY

**Decay of Algae Increases
Manganese in Water Supply**

DECAY OF ALGAE, which are low forms of water plants, together with decomposition of other organic material, is responsible for increased concentration of the mineral manganese in some drinking waters. The acidity of the water examined was found to be increased by the decomposed matter, and to this acidity was due the dissolving of the manganese.

This discovery was made by Edward S. Hopkins and George B. McCall, who made a careful study of the water sup-

ply of Baltimore. Samples of water from the 23,000,000-gallon reservoir were taken weekly for about two years. The bottom of the water contained the manganese, and with the seasonal turnover was brought to the top to be used in the city's supply.

For the past few years it had been noted that this supply underwent an increase in manganese, beginning in late October and continuing until January of each year. This was the manganese which went into the solution during the summer season. Heretofore, the mystery of the manganese in the water supply had defied satisfactory explanation.

Science News Letter, September 19, 1931

MATHEMATICS

**New Way to Solve
Equations in Physics**

A NEW METHOD of solving integral equations has been announced by Prof. R. E. Langer, and Dr. M. L. Hartung, of the University of Wisconsin. These equations play fundamental roles in the physical theories of heat, sound, light, and electricity. They have been used in the recent revolutionary theories of physics and in the biological theories of heredity. They have played a dominant role in checking the "normal frequency law" which is the basis of most statistical theory and practice today. Within the last five years it has been shown that a dynamical theory of economics cannot be developed without these equations.

Science News Letter, September 19, 1931

ORNITHOLOGY

**Birds Fly at High Speeds
Timing by Airplane Shows**

GEESE pursued in an airplane on four different occasions flew from 52 to 56 miles per hour, it has been revealed. In a Scottish estuary ducks were chased in the air going at a speed of 46 miles per hour.

Teal were found to be fast fliers. Lieutenant R. W. Wicks of the Royal Navy, who observed bird speeds, pursued them. He was flying 75 miles an hour when they were a quarter of a mile away, and it took him some minutes to catch up.

Grouse over a moor at Perthshire had a top speed of 58 miles an hour. Snipe do not let themselves be paced. The quarry makes a couple of turns and vanishes completely.

Science News Letter, September 19, 1931

IN SCIEN

PHYSIOLOGY

**Hens Fed with Vitamins
Lay Vitamin-Rich Eggs**

ONE WAY of getting plenty of the rickets-preventing vitamin D in your eggs is to feed lots of it to the hens that lay them. Experiments indicating this were performed by Francis G. McDonald and O. N. Massengale.

They fed pullets a diet containing codliver oil for eight weeks, and then tried oil from their egg yolks on rats. Afterwards they gave the same pullets a course of feeding on irradiated ergosterol of 10,000 times the strength of the codliver oil, and again fed oil from their egg yolks to rats. They found that the egg yolk oil after the highly concentrated ergosterol feeding was 185 times as effective in preventing rickets as was the yolk oil after the codliver oil feeding.

Science News Letter, September 19, 1931

PSYCHOLOGY

**Person Who Relaxes May
Be Able to Do Most Work**

THE MAN who can "take it easy" while he works may get the most done, it is indicated in a report by Dr. G. L. Freeman of Yale University.

Dr. Freeman has studied the relation between muscular tension accompanying mental effort, the quality and quantity of work done, and various incentives to work. He found that with very simple tasks such as moving a finger back and forth, the output increased in proportion to the amount of muscular tension. But with more complicated tasks, such tension may be a hindrance.

When the subjects of the experiment competed for a money prize, this incentive affected both the muscular tension and the output. Discouragement lowered tension and output; over-encouragement increased tension but decreased accuracy, Dr. Freeman reported. Knowledge that the task required was difficult increased the tension, but also increased the accuracy of the performance.

Science News Letter, September 19, 1931

CE FIELDS

MATHEMATICS

Mathematics Named as Outstanding Business Need

MORE THOROUGH mathematics, more honest mathematics, is one of the outstanding needs of business at the present time. Without better mathematics than now goes toward the making of statistical economic forecasts, there cannot be any hope of making such forecasts really mean anything.

Thus, in brief, declared Prof. Harry C. Carver of the University of Michigan, in a report to the American Mathematical Association. Prof. Carver said, in part:

"It is greatly to be regretted that that phase of business statistics dealing with the analysis and projection of time series rests on an exceedingly unstable foundation. There is absolutely no excuse for this state of affairs. For the most part this work is being done by economists and 'professional forecasters' who are far more interested in making predictions than they are in estimating the probability that the actual occurrences will differ from their forecasts by more than a specified per cent"

"I believe that by the time the mathematicians realize the importance of this branch of applied mathematics, the business world will be insisting on a better cooperation of mathematics and economics, and forecasting will have ceased to be a racket."

Science News Letter, September 19, 1931

PSYCHOLOGY

Baby Chimpanzee Superior To Human Infant in Tests

A FEMALE baby chimpanzee, whose development from its very beginning has been known and watched by scientists, has been brought up in the laboratories of comparative psychobiology at Yale University under conditions similar to those of a bottle-fed human infant. Throughout its life it has been carefully measured and watched, and it has been given the same mental and physical tests that are given in the

psychological laboratories at Yale to human babies.

The results of these tests have been described by Carlyle Jacobsen and Joseph Yoshioka of Yale.

The rate of physical development was found to be much greater for the chimpanzee than for the human infants during the first six months of life, but the chimpanzee's growth slowed down during the second half year. The chimpanzee doubled her birth weight in three months, trebled it in six months. At six and one-half months she had all her milk teeth except the canines.

On tests of motor behavior she showed more rapid development than the human infants up to the eighteen-month tests. She was also superior, although less pronouncedly so, on the tests of adaptive and personal-social behavior up to the twelve-month tests. The order in which the different achievements became possible for her was the same as for the human babies.

Science News Letter, September 19, 1931

PUBLIC HEALTH

Cancer Deaths Increase Greatly During 1931

AN UNUSUALLY large increase in the number of cancer deaths for the first six months of 1931 is reported by the Metropolitan Life Insurance Co. A rise from 77 deaths per 100,000 population in the first half of 1930 to over 83 per 100,000 in the corresponding period of 1931 is the largest increase in deaths from this cause ever recorded for a one-year period, the company's statisticians state.

While these figures apply only to the industrial policy-holders of the company, there is indication that the records for the rest of the population will show a similar large increase in numbers of cancer deaths during the year. However, in one section of the United States, the Far West, the cancer death rate has actually declined this year, the company's records show.

The influenza epidemic may have contributed to the increase in cancer deaths during the first three months of the year, as deaths from all chronic diseases are usually more numerous during influenza outbreaks, the report explained. The increase in cancer deaths during the second quarter of 1931 cannot be explained on the same grounds, however, for the influenza outbreak was well over by that time.

Science News Letter, September 19, 1931

MEDICINE

U. S. May Become Immune To Infantile Paralysis

A POSSIBLE favorable result of outbreaks of infantile paralysis such as the present one may be the conferring on the population of the country an immunity to the disease and ability to resist its attacks, it appears from a discussion of the disease by Dr. Simon Flexner, director of the Rockefeller Institute for Medical Research, in a recent issue of *Science*.

"There are strong reasons for believing that a gradual immunization of the population of the United States is taking place as a result of the epidemics of infantile paralysis which have prevailed in different parts of the country since the large Swedish-Norwegian outbreak of 1905," Dr. Flexner declared.

"An attack of infantile paralysis is protective for life, irrespective of the intensity of the attack," Dr. Flexner explained. "Persons who have had infantile paralysis possess in their blood certain protective or healing substances which can be used effectively to treat persons sick of the disease, and perhaps to prevent the disease in other and exposed children."

"Not only are the protective and curative properties present in the blood of persons who have recovered from obvious attacks of infantile paralysis; they are present also in some amount in the blood of many adult persons who have never suffered from the disease."

Science News Letter, September 19, 1931

ARCHAEOLOGY

Sacred Spring Among Finds in Indian Village

A SACRED spring, timbered and cribbed with cedar logs in ancient times, and at the bottom of which were ten pottery pieces and more than forty prayer-sticks, was found by Dr. Paul S. Martin, leader of the Field Museum Archaeological Expedition to the Southwest, at Ackman, Colorado.

The prayer-sticks were very similar to those used by Hopi Indians, and pottery types were unlike anything in the neighborhood, belonging apparently to the Chaco style hundreds of miles away in New Mexico. A trench made through a kiva or temple shows walls and floors whose character was found to be most puzzling.

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