

completed and tested, Prof. Robert Van de Graaff and Drs. C. M. and L. C. Van Atta told the meeting.

The towering spheres that store up electric voltages in the airship hangar at Round Hill have been completed and tested for some time but the designed use of the huge equipment for atomic bombardment experiments has been delayed until the accelerating tube was finished.

The tube rests, high in the air, on a special I-beam made of bakelite-impregnated plywood. Each of its four sections contains 12 porcelain cylinders and eleven steel electrodes which gradually accelerate the particles passing down their axes from voltages supplied by the collecting spheres at each end. In use the tube is evacuated. Arrangement has been made to focus the beam of charged particles as they speed down the tube to the target so that the beam will not spread out and hit the walls of the tube with destructive effect.

Science News Letter, May 8, 1937

ASTRONOMY

Places Last Bolt in Frame Of 200-Inch Telescope

See Front Cover

THE FINAL bolt in a spiderweb of steel which will finally become the mounting for the world's largest telescope has been turned into place at the turbine plant of the Westinghouse Electric and Manufacturing Company.

Dr. Robert A. Millikan, Nobel prize winner and chairman of the executive council of California Institute of Technology at Pasadena, attended the culminating act of fitting the final part of the mounting which will have a total weight of 900,000 pounds. Thus the

second stage in the fabrication of the biggest "eye" of astronomy was finished. The great glass disc for which the mirror of the huge telescope has long since been cast and is now being ground is already in the workshops of Caltech, gradually being fashioned—"figured" as astronomers say—to its proper curvature. The completed telescope: mirror, mounting, observatory building and auxiliary equipment, will cost \$6,000,000 when finally put in operation in 1940. Funds were made available by the Rockefeller Foundation for the project.

The operation of the 200-inch telescope will be in charge of scientists at California Institute of Technology, and plans have been made for close cooperation with the present Mt. Wilson Observatory of the Carnegie Institution of Washington which houses the 100-inch telescope that is, today, the world's largest.

The tube of the telescope, at the bottom of which will be placed the 200-inch diameter mirror, has a total length of 60 feet—as high as a six-story building. It was made in sections, the largest of which is 22 feet wide and 12 feet high. A special annealing furnace had to be built to heat this unit after fabrication so that the internal stresses could be relieved. Although large, this piece weighs only 26,000 pounds. Heaviest unit is the central section of the horseshoe yoke of the mounting which weighs 120,000 pounds.

Oil Bearings

The weight of the entire telescope will rest, and float, on special oil bearings which will enable the instrument to be turned easily with a very small force. Previous mountings of telescopes have been on pools of mercury.

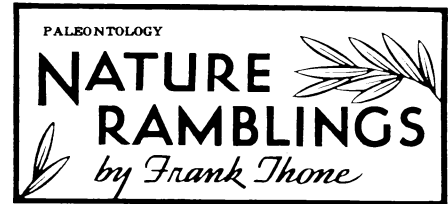
The three major units of the mountings, their size and weight, are:

1. The tube, which is 22 feet one inch in diameter and 45 feet long, with a total weight of 150,000 pounds.
2. The cage, which is 22 feet one inch in diameter and 12 feet long, weighing 26,000 pounds.
3. The horseshoe yoke and side girders, weighing 370,000 pounds, with a maximum dimension of 46 feet and a thickness of four feet.

The total weight of the mounting is 900,000 pounds, or 450 tons.

Science News Letter, May 8, 1937

The only great ape that walks erect habitually is the gibbon, which rates as the least intelligent and least man-like of the apes.



Dinosaurs—and Others

ISN'T IT ODD, how we have fallen into the habit of regarding all extinct reptiles as dinosaurs—if only they were big ones!

Dinosaurs, to be sure, probably were the dominant forms of all reptile life that has ever inhabited the earth. They really were the bosses of the land, back in the geologic ages which scientists group together under the name of Tertiary Period, which has been called for convenience the Middle Ages of animal life. Dinosaurs were both big and varied, they included both plant-eating and flesh-eating forms, they developed such fantastic extremes as the carnivorous biped tyrannosaurs, the mountain-bodied but pin-headed brontosaurus, the freakishly-horned triceratops.

But not every reptile of those far-gone days was a dinosaur. The swimming forms that ruled the sea, the plesiosaurs and the ichthyosaurs, were not properly dinosaurs. They belonged to quite distinct groups or orders of animals, just as among modern insects flies and bees belong to quite distinct groups even though they may look somewhat alike.

Similarly, the flying reptiles that for a time held the lordship of the air were not flying dinosaurs. So far as is now known, no dinosaur ever flew. These early fliers belong to a group of their own, usually called the pterosaurs, which means merely winged reptiles. Nor were the pterosaurs the ancestors of birds. Birds did originate during the Age of Reptiles, and the first birds were astonishingly reptile-like, but they came of a different ancestral stock.

The reptiles of the Tertiary included some types that are still in existence today, notably the turtles and the crocodiles. These came in all sizes. There

PSYCHOLOGY OF SEX
by HAVELock ELLIS

ONE VOLUME
UNABRIDGED

CARL VAN DOREN Says:
"The best one-volume treatment of sex in the English language."

"...the best of all available books on this subject."
—HYGEIA (Published by the American Medical Association)

AUTHORIZED EDITION

—PARTIAL CONTENTS—
The Art of Love Sexual Variations and Substitutes for Sex Abnormalities
Sex in Marriage Sex Life of Unmarried Adults
Sexual Adjustments Age and the Sexual Impulse

Price \$3.00 (Postage 15c extra) 389 Pages
5-DAY MONEY-BACK GUARANTEE
Emerson Books, Inc., Dept. 981-S, 251 W. 19th St., N. Y. C.

were both giant turtles and little ones then, as there are giants and little ones today. There were some huge crocodilians then—but so far as that goes there still are pretty big “croc” and alligators, where they have not been shot up too much.

The most successful of modern reptile

groups, the one that includes both lizards and snakes, were less developed during the Tertiary than they have become since. In fact, the snakes at least have apparently undergone the greater part of their evolutionary development since the end of the Age of Reptiles.

Science News Letter, May 8, 1937

GEOPHYSICS

Severe Magnetic Storms Disturb Telegraph and Radio

At Times It Was Impossible To Send Any Messages As Fluctuations Occurred in Earth's Magnetic Field

FLOODS in the East were not the only evidences of storm during the recent past.

A different kind of storm, having no known direct connection with the weather, raged about the whole earth from Sunday, April 25, until Thursday, April 29, unseen, unfelt, unnoticed by most people, but making no end of trouble for telegraph and shortwave radio operators and engineers.

It was a magnetic storm, consisting of fluctuations in the earth's magnetic field. Dr. A. G. McNish, of the Carnegie Institution's laboratory of terrestrial magnetism stated that it was the most severe magnetic storm experienced for many years.

Its most immediate and important consequences, in the affairs of the everyday world, were severe interferences with types of communication depending on magnetic circuits in wire and radio waves in air, that is, the telegraph and radio businesses. The telegraph companies had “dead” periods when their instruments would not work, and the radio signals were subjected to sudden and severe fits of fading.

Transatlantic telephony showed a noticeable disturbance for a half-hour at midday on Sunday, and again from 2:25 p. m. until midnight. Severest difficulty occurred on Tuesday night, when transmission fell, for a short time, as low as four per cent. of normal.

Transatlantic shortwave radio was in similar difficulties. Between 4 p. m. and 4 a. m. daily, strong magnetic effects were noticed. At times it was impossible to send messages at all. In addition, there was a certain amount of noon-day “blanketing.” These difficulties, however, did not appear in the radio

traffic with Central and South America except for a few brief intervals.

Another consequence, which would have been more noticed if the skies had been clearer in the East was a great increase in the display of the aurora borealis. Capt. N. H. Heck, of the U. S. Coast and Geodetic Survey, said that only a cloudy sky prevented the aurora from being seen at Washington, D. C. Such a display at this latitude is a rare event.

There appears to be a correlation between sunspot activity and magnetic storms. At present the cycle of sunspot activity is rising to a maximum, so that more of these disturbances are to be expected during the coming few years.

Magnetic storms tend to recur about every 27 days, that is, once for every rotation of the sun. There was a severe one during the last two days in March. The next magnetic storm may therefore be expected a few days before the end of May.

Sunspots Marked Coming

Two great groups of sunspots, “among the largest of the present cycle,” marked the coming of the storm, Dr. F. H. Seares of the Mt. Wilson Observatory, in California, wired Science Service. The storm was marked by rapid fluctuations in the earth's magnetic fields during intervals of from twelve to twenty hours, separated by periods of quiescence lasting from eight to fourteen hours.

Science News Letter, May 8, 1937

Children who get enough vitamin D in diet when their permanent teeth are forming are less apt to have the molar teeth decay in later years, so British researchers conclude.

GENETICS

Rickets Tendency Shown To Be Hereditary

RICKETS can “run in the family,” it appears from experiments reported here before the meeting of the National Academy of Sciences, by Drs. G. L. Streeter, E. A. Park and Deborah Jackson of the Carnegie Institution of Washington. The research was conducted at the Institution's department of embryology in Baltimore.

It is not the disease itself that is inherited, but the tendency to develop it if the diet is lacking in vitamin D and is defective in other respects during a critical period of early growth.

Dr. Streeter and his associates put young rats on such a rickets-producing diet as soon as they were weaned. After three weeks on the deficient diet the animals were X-rayed, to show how far rickets had developed, and were then returned to normal diet. At four months of age they were bred.

By mating susceptibles with susceptibles, after fourteen generations a strain of rats was produced which, though it resembled the non-susceptible rats in every other respect, showed a consistent, high hereditary tendency to develop rickets under dietary conditions to which the other rats showed a greater degree of resistance.

Science News Letter, May 8, 1937



Write • SPEAK • Read ANOTHER LANGUAGE

Give yourself the most precious gift of all—a NEW LANGUAGE—or endow a dear one with the ability to speak, read and understand

**FRENCH • GERMAN
ITALIAN • SPANISH**

or any of the 23 languages offered by the Linguaphone Institute.

The quick, easy way to acquire native accent and perfect fluency at home under the greatest language masters. Linguaphone Courses are used by America's foremost actors, singers, writers, teachers and thousands of the public.

Send for FREE Booklet

LINGUAPHONE INSTITUTE

35 Rockefeller Center

New York City