# SCIENCE NEWS

*Science Service, Washington, D. C.*

## SCIENCE IN 1937

### CHEMISTRY—PHYSICS

THE discovery of a new sub-atomic particle heads the list of 1937 achievements in physics and chemistry. The new particle, yet unnamed and without a niche in the structure of atomic physics, is intermediate between the electron and the proton. It appears to possess either a positive or negative electrical charge and preliminary determinations of its mass placed it at about 150 times the mass of the electron.

Other outstanding events included:

Element No. 87 reported discovered and named Madavium.

Construction of a cyclotron atom smasher to generate potentials of 50,000,000 volts and costing $100,000 was begun.

The concentration of the heavy isotope of nitrogen was announced.

Cosmic rays were found to have a small daily variation in intensity.

The oxygen in rocks has been found to be heavier than the oxygen in air or water.

Construction was begun on a new radium-refining plant at Port Hope, Ontario.

High-pitched sound waves were used to precipitate chimney smoke.

The most accurate determination of the force of gravity ever made in America was completed.

Ethyl cellulose was added to the chemical family of transparent wrapping materials.

Improved electrostatic high-voltage generator, operating in a pressure chamber to prevent electrical sparkover, was put in operation for atom-smashing experiments.

The molecular weight of visual purple, chemical compound in the eye's retina which enables man to see, was determined as about 800,000.

Glass fibers were more widely used for special textiles.

Tracks made by atomic particles in photographic emulsion were used to distinguish the nature of the particles.

Magnesium, featherweight metal, was refined by an electrothermic process at a cost less than aluminum.

The magnetism of the neutron was demonstrated.

A primeval explosion which led to the expanding universe was suggested as cause of cosmic rays.

Seventy compounds closely related to life-sustaining chlorophyll were prepared synthetically.

Ten amino acids were pronounced essential to life and growth.

Tri-calcium phosphate was found to remove fluorine compounds from drinking water.

Two hypotheses were advanced giving some other interpretation of the so-called "red shift" of light from distant nebulae than the familiar expanding universe theory.

The magnetic force of the basic unit of magnetism, known as the magneton, was determined.

Using "heavy" hydrogen atoms as tags, chemists were able to trace the storing of fat in the animal body.

Research disclosed milk sugar is made in the mammary glands of animals out of glucose and lactic acid.

By atomic bombardment titanium was made artificially radioactive, liberating gamma rays for periods useful in cancer treatment.

A rapid method of identifying ores by the iridescence of thin sections was developed.

Cosmic ray particles were observed smashing into the earth's atmosphere with energies of 10,000,000,000 volts.

### EARTH SCIENCES

DISCOVERY that the puzzling "cryptovolcanic structures"—volcano-like formations without evidence of subterranean fire—resemble the eroded remains of meteor scars is one of the outstanding achievements in earth sciences this year. Falling meteoric masses of great size, practically unimpeded by air friction, release energy in landing sufficient not only to backfire themselves out of the crater, but to throw the underlying rock into wave-like formations, which may be recognized even after thousands of years of erosion, it was discovered.

Other developments in earth sciences during the last year were:

Story of the ice ages was read by cores of mud taken from bottom of Atlantic with "gun" sampler.

A weather station near the North Pole was established by Soviet scientists through use of air transport.

The site of the dinosaurs' "last roundup" in Utah was explored by paleontologists.

*Australopithecus*, strange extinct ape of South Africa, was shown to have marked human-like characters in teeth, shape of face and other details.

Studies of marine canyons showed that their extent and numbers were greater than heretofore supposed, but gave no certain clue to their origin.

Fossil pollens in peat bogs show that, compared with present temperatures, the climate was warmer just after the most recent ice age, then cooler only a few thousand years ago.

The earth's age was checked by studies of radioactive potassium, and the figures agreed closely with those found from studies of uranium.

Life appeared on earth at least 1,250,000,000 years ago, according to studies of the radium and helium content of the oldest rocks containing evidence of life.

A perfectly preserved hairy mammoth probably more than 10,000 years old, was found frozen in a Siberian bog with hide and flesh intact.

Geophysical methods of prospecting were widely adopted in Canada, where more than 99 per cent. of the area is covered by glacial drift which makes ordinary prospecting methods ineffective.

New types of fossil reptiles, related to the dinosaurs, were found this year in Brazil, Texas, Wyoming, Utah and Colorado.

Earthquake epicenters were found to move during the quake as adjustments of earth stresses progress.

Fossil bones of a hippopotamus-sized mammal that lived in Colorado forty-five million years ago, when the Rocky Mountains were a flat grassland, were discovered.

Record-breaking floods visited the Mississippi, Ohio and Connecticut valleys during 1937, causing great property damage and accelerating flood-control work.

### Astronomy

THE discovery of two great exploding stars, super-novae the astronomers call them, through use of a relatively small Schmidt telescope operating from Mount Palomar, Calif., the future home of the great 200-inch reflector, was an outstanding feature of the astronomy of 1937. These super-novae, only 15 of which had been discovered in all previous history, were each 500,000,000 times the sun's brilliance and they were both extremely distant in the heavens.

Outstanding astronomical developments of the year include:

The most extensive metagalactic cloud or star system, more than 50,000 times the Milky Way's size, was discovered.

Sprawling cosmic dust cloud near sky's North Pole was discovered obscuring and reddening star light.

Two new interstellar gases, neutral potassium and calcium, were discovered.

A new system was discovered in Milky Way consisting of giant cluster of hundreds of stars which revolves about still larger cluster.

Total solar eclipse of June 8, was observed by expeditions to South Sea desert island, Peruvian Andes, from airplanes and steamer.

Sub-stratosphere airplane photographs of totally eclipsed sun, June 8, showed corona to be uniform, globular, million-mile-thick blanket.

Temperature drop of 1500 degrees Centigrade was observed between sun's surface and its overlying atmosphere.

Sun-spots increased in number, bringing magnetic storms and radio fade-outs.

Six new comets or asteroids were reported: Whipple comet, Wilk comet, Gale comet, Finsler comet which reached naked eye brilliance and developed two tails, Hubble comet, and Reinmuth object which moved very speedily.

Returns of the following periodic comets were observed: Daniel (1909), Grigg-Skjellerup, Schwassman-Wachmann, Encke.

Eros, tiny planet neighbor to earth, was shown to be shaped like a huge brick tumbling end over end in sky, which explains light variations.

### Biological Sciences

THE past year was marked by continued progress in techniques for the manipulation and control of life in its earliest stages. Unfertilized eggs of rabbits were sent into first stages of development when placed in contact with the sperm of rats. Fruit flies, important in genetical research, were artificially fertilized for the first time. Parts of sea-urchin eggs from which the nuclei had been removed were stimulated to divide to as many as 500 new cells by chemical and physical means. First commercial-scale production of chicks by artificial insemination of hens was tried.

Other important events in the life sciences were:

Paramecia, one-celled animals, previously thought to be without sex, were found to be of two kinds.

Catalase, important in the life of cells, was obtained in pure crystalline form.

Heartbeats of insects were recorded with a new mechanism.

Experiments showed that trout, like other animals, can have their breeding period changed by changing the length of time they are exposed to light each day.

Plant cancers, usually caused by germs, were experimentally induced with chemicals.

Rat embryos were grown for several days, in glass vessels containing a circulating nutrient fluid.

Flowers were induced to form fruit without pollenation, through spraying with growth-promoting substances.

Water "activated" with x-rays was found to be toxic to plants and animals.

Major outbreaks of grasshoppers and Mormon crickets occurred in the West, and autumn studies of egg deposits indicated probability of similar outbreaks next year.

The white-fringed beetle, a new insect menace, was found in three Southern states and brought under control.

The Migratory Bird Treaty with Mexico was ratified.

A new organization, the Wildlife Society, was formed to promote the protection and restoration of native species.

The first nation-wide bird census was taken by the National Association of Audubon Societies.

A $615,733 foundation was established at Harvard, for research on faster-growing tree varieties.

Germany entered the whaling industry, with the aim of reducing import of necessary fats.

Study of brains of lower primates showed them to be remarkably symmetrical, contrasting with human and higher ape brains, which are somewhat lopsided.

Nine live gibbons, man's nearest ape cousins, were brought back from Indo-Malaysia, to found a study colony in Puerto Rico.

Specimens of the long-sought African peacock were brought to the United States.

### Anthropology and Archeology

NEWLY discovered fossil remains of the Java Ape-Man, *Pithecanthropus erectus*, definitely proved that this primitive being was a human being, not an ape. Associated fossils indicate that this ancient race is not as old as was once supposed.

Other notable researches included:

*Homo sapiens* has something new to be proud of, since anthropologists in 1937 dug up evidence that our own species of mankind was on earth much earlier than supposed. Skeletons in Palestine caves reveal *Homo sapiens* present among other, less enduring types of Old Stone Age man as early as 60,000 years ago.

Peking Man, who inhabited a China cave more than half a million years ago and whose remains have amazed modern science, became a more vivid figure from the past

with discovery of a skull showing more clearly what his face was like. The new skull includes eye socket, nose bones and other previously unknown features.

Definite proof that man reached the Straits of Magellan just after the most recent ice age was unearthed in caves where fire-scarred bones of extinct ground sloths and horses were found under four other culture layers and a bed of volcanic ash.

America acquired new evidence of early inhabitants when Utah caves yielded flint and bone tools unlike those of Folsom Man and an infant's skeleton 5,000 to 10,000 years old.

Folsom hunters of ancient America were more definitely assigned to the late Ice Age, when geologists in Colorado dated an earth layer containing Folsom tools as belonging to that era.

The biggest human skull ever found was unearthed among Indian remains in Virginia.

Excavating Plains Indian sites took on a practical angle, when archeologists reported these Indians apparently found certain areas undependable for farming.

Villages of Indians who met Columbus were excavated in the Bahamas.

Ruins of a pyramid near Guatemala City revealed Mayan Indians rebuilt the pyramid eight times.

Shattered thrones unearthed in Piedras Negras, Guatemala, inspired a new theory that social revolt helped destroy the Old Mayan Empire.

Chemical analysis demonstrated Eucador's Indians actually achieved an alloy of platinum.

A new type of Stone Age man was unearthed at Steinheim, Germany, with skull older, yet partly more modern in type, than Neanderthal Man.

The long-sought Temple of Ares, god of war, was unearthed in the Athenian Angora.

Flint tools found near Bethlehem revealed man's existence in Palestine, at the dawn of the Stone Age.

Help for understanding politics in the Bible era was provided by finding several thousand letters to a Syrian king, about 1900 B. C.

A prince's palace occupied in five historic eras was unearthed at Megiddo, Palestine, and also a great hoard of ivory and gold art.

A real estate deed 3,500 years old, unearthed at ruins of Dura on the Euphrates, added over a 1,000 years to antiquity of that city.

Tepe Gawra, Mesopotamia, "world's oldest city," was revealed as having flute music, art vases, and fine architecture at the very early era of 400 B. C.

*(To be Concluded)*

# PREVIEW OF THE ANNUAL SCIENCE EXHIBITION

(Continued from page 8)

## NATIONAL LIVE STOCK AND MEAT BOARD

**Chicago**

**Booth 57**

The National Live Stock and Meat Board will present an exhibit of children's diets in wax models, illustrating the normal diet for children of three different age groups. The background will consist of the Food Value charts in the form of electrically illuminated transparencies. Nutrition literature will be available for distribution.

## NATIONAL TUBERCULOSIS ASSOCIATION

**New York**

**Booth No. 74**

This society will display a six panel Tuberculin Test Exhibit.

## PHIPPS AND BIRD, INC.

**Richmond, Va.**

**Booth No. 18**

An exhibit for physiologists of a Kymograph with the various attachments demonstrating the practicability of ink writing, thus doing away with the need for smoking and shellacking of Kymograph paper. Also on exhibition will be a micro-centrifuge developed primarily for Phipps and Bird for semi-micro qualitative analysis in chemistry and inexpensive enough to be furnished individual students; the Coleman pH Electrometer with glass electrode; and an inexpensive oven with thermostatic control within a temperature range to 175° C.

## PRENTICE-HALL, INC.

**New York**

**Booth No. 78**

". . . popularized science of the most satisfactory sort . . ." is how *The New York Times* describes "Ascaris: the Biologist's Story of Life," the new book by Dr. Richard Goldschmidt, of the University of California. The exhibit will include the fields of Physics, Chemistry, Engineering, Meteorology, Biology, Hygiene, Mathematics, Statistics, Psychology, and Education. Advance proofs will enable visitors to examine important books that will be published in 1938.

## RADIO CORPORATION OF AMERICA

**New York**

**Booth Nos. 88, 89**

Radio Corporation of America will illustrate some of the work done in its laboratories from the standpoint of research and the commercialization of research projects. New and useful instruments for laboratory application will be shown in operation as well as evidence of research work which has not yet reached the public.

## H. M. RANDALL

**University of Michigan**

**Booth Nos. 43, 44**

Spectroscopy of the Far Infrared. This exhibit will consist of the actual apparatus, whenever its transportation is possible, used in this type of spectroscopy. Thus, thermocouples, echelette gratings, prisms and plates of crystals transparent beyond 15 μ, together with samples of the uncut crystals as they appear when removed from the melt, will be shown. A crystal cutting machine will be