

SCIENCE NEWS

NOTABLE PROGRESS MADE IN SCIENCE
DURING 1923*Science Service*

IMPORTANT progress in all fields of science were made during the past year.

Outstanding events in astronomy included the discovery of the reversal of polarity of sun-spots and confirmation of the second and third predictions of the Einstein theory.

A new type of boiler and turbine using mercury instead of steam promises to revolutionize power production.

Missing chemical element No. 72 was discovered, named "hafnium," and found to be like zirconium.

Dinosaur eggs, ten million years old, were discovered in Asia.

Pictures were sent by radio, and the continent was crossed in a non-stop airplane flight.

Insulin as a remedy for diabetes was put into general use.

Important events in various fields included:

ASTRONOMY

Einstein's third prediction as a consequence of his theory of relativity, that spectral lines are displaced under the influence of the gravitational field of the sun, confirmed by Dr. Charles E. St. John, of Mt. Wilson Observatory.

Dr. W. W. Campbell, of Lick Observatory, announced that photographs of 1922 Australian eclipse expedition confirmed the Einstein theory.

Decrease of 4 per cent. in the heat of the sun during the late months of 1922 and the early months of 1923 announced by Dr. C. G. Abbot, of the Smithsonian Institution.

Discovery of the second closest visible star, "Epsilon Indi," seven light years distant, by the Harvard College Observatory.

Discovery of the densest star, not yet named, in the constellation "Coma Berenices" by the Allegheny Observatory.

Total eclipse of the sun occurred on September 10, but observations in California and Mexico were a partial failure because of cloudy weather.

The Greek church replaced the Julian calendar with the Gregorian.

A new asteroid was discovered by Professor George H. Peters, U. S. Naval Observatory.

Harvard College Observatory announced that Nova Aquilae No. 3, the brightest new star seen for centuries, has faded down to normal star brilliance.

Observation of the tail of Baade's comet pointed toward the sun instead of away from it, as is usual, puzzled astronomers at Yerkes Observatory.

Discovery of the reversal of magnetic poles of sun-spots by Dr. George E. Hale, of Mt. Wilson Observatory,

opened a new field in the study of sun-spot phenomena.

Distribution of heat in the spectrum of stars, determined by Dr. C. G. Abbot, working at Mt. Wilson Observatory, was found to differ from distribution of light.

BIOLOGY

Germans announced that sodium di-hydrogen phosphate in moderate doses increases endurance and enables greater physical output without exhaustion.

Complete sex-reversal in a hen, which, after having laid many fertile eggs, became the father of healthy chicks, reported to the British Association for the Advancement of Science.

Experiments at Birmingham University, England, indicated that drinking salt water in moderate amounts is a preventive of heat exhaustion.

Professor G. W. Cavanaugh, of Cornell, announced that vitamin C is present in milk only when cows eat green feed.

Professor Ivan G. Pawlow, Russian physiologist, announced that mice inherit ability to learn.

Ether found to stimulate growth of dormant plants.

Dr. Herbert Evans and Dr. K. Scott Bishop, of the University of California, announced discovery of vitamin X in lettuce, alfalfa, egg yolk and fresh meat, necessary to animals before they can produce young.

Rockefeller Foundation pledged \$325,000 for biological research fellowships under the National Research Council.

Dr. Charles A. Kofoed, of the University of California, announced the discovery of high-speed evolution among microscopic parasites in the bodies of ants.

Photography of plants by the light given out by their own fluorescent pigments has been accomplished by Professor Francis E. Lloyd, of McGill University. It has revealed new uses for some of their structures not previously suspected.

The thymus gland was found to be indispensable in birds and other lower vertebrates for the production of egg membranes and shells. In mammals, including man, it is not of great importance.

PHYSICS AND CHEMISTRY

New "Zeta" rays resulting from atomic collisions discovered by Professor W. D. Harkins, of University of Chicago.

Method for spraying metals on cold surfaces has been announced by U. S. Bureau of Standards.

Voltage of a lightning flash has been measured and found to be about 100,000,000.

A device to eliminate undesirable noises, by making sound waves interfere with each other, has been invented by Dr. G. W. Stewart, of the University of Iowa.

Missing chemical element No. 72 has been discovered by Drs. D. Coster and G. Hevesy, of Copenhagen, and named "hafnium."

How the apple's odor can be made synthetically for use in soft drinks was discovered by Dr. Frederick B.

Power and V. K. Chesnut, of the U. S. Bureau of Chemistry.

A new compass for ships has been perfected at U. S. Bureau of Standards.

A new motion picture camera and projector for amateurs using small sized film has been perfected.

Dr. R. A. Millikan, now director of the California Institute of Technology at Pasadena, was awarded the 1922 Nobel prize for physics in recognition of his isolation and measurement of the electron.

The world's shortest electric waves were produced by Drs. E. F. Nichols and J. D. Tear. They were one fiftieth of an inch in length and are equal to shortest of heat waves; thus the gap in the spectrum between heat and electro-magnetic waves was closed.

MEDICINE

New disease "tularemia," rarely fatal, transmitted by bites of stable-flies and bedbugs from small animals to man, found by U. S. Public Health Service to be widely distributed in the United States.

Artificial fat, "intarvin," for use in the prevention of acidosis in diabetes invented and manufactured in New York.

The first recorded operation on the valves of the heart was performed by Drs. E. C. Cutler and S. A. Levine, of the Harvard Medical School. The patient recovered.

Bacillary dysentery was reported cured by bacteriophage treatment.

Dr. Simon Flexner, of the Rockefeller Institute, announced by radio the discovery by Drs. Peter K. Olitsky and Frederick T. Gates of *Bacterium pneumosintes*, the germ held responsible for influenza.

Bacteria capable of causing tooth decay have been discovered and isolated by Dr. F. E. Rodriguez, U. S. Army Dental Corps.

Ethylene gas was discovered to be effective anesthetic by Drs. A. B. Luckhardt and J. B. Carter, of the University of Chicago.

A substance similar in effect to insulin has been extracted from yeast, by L. B. Winter and W. Smith, in the Biochemical Laboratory at Cambridge.

Tubercle bacillus has been found by Drs. E. B. Brown and Treat B. Johnson, of Yale, to be an animal instead of a plant.

Acetylene gas used as anesthetic in Germany.

Paresis treated by giving patients malaria.

Invention of sulfarsphenamine, a new drug for treating syphilis, was announced by Drs. Carl Voegtlin and J. M. Johnson, of the U. S. Public Health Service.

Tryparsamid, a new arsenical drug remedy for general paralysis and locomotor ataxia, was reported to the American Medical Association by Drs. W. F. Lorenz, A. S. Loevenhart, W. J. Blackwen and F. J. Hodges.

The Army Medical School developed rapid and easy way of purifying drinking water with iodine.

Drs. F. G. Banting and J. J. R. Macleod, of the University of Toronto, were awarded the 1922 Nobel prize for medicine in recognition of their discovery of insulin, the specific for diabetes.

A parasite which causes disease in both plants and man has been discovered by Dr. Richard P. Strong, of the Harvard Medical School. In order that it may affect man it must pass through an insect and a lizard as intermediate hosts.

GEOLOGY

The U. S. Coast and Geodetic Survey announced that studies of earth movements in California show varying and opposing motions, and their study may lead to prediction of earthquakes.

Fossil ancestors of American dinosaurs and dinosaur eggs discovered for the first time in Mongolia by the Third Asiatic Expedition of the American Museum of Natural History.

Japan suffered the most disastrous earthquake of modern times.

EXPLORATION, ARCHEOLOGY AND ANTHROPOLOGY

The Canyon of the Colorado River was surveyed by a U. S. Geological Survey party.

Carlsbad caverns in New Mexico were discovered and explored by the U. S. Geological Survey.

Announcement was made of ten year program of archeological research in the Mada district of Yucatan by the Carnegie Institution of Washington.

Discovery by Smithsonian Institution of mysterious tribe of Indians in northwest Labrador, apparently unrelated to neighboring tribes.

Knud Rasmussen, Danish explorer, began the study of Eskimo in northernmost Canada.

Dr. Eugene Dubois, of Amsterdam, permitted inspection by American scientists of bones of Java ape-man, discovered by him 30 years ago.

Deformed prehistoric skull believed to be earlier than any known Indians and to show relationship with South American tribes, was found near Noel, Missouri.

RADIO AND ENGINEERING, AERONAUTICS

Boiler and turbine using mercury vapor instead of steam put to practical use in Hartford, Conn., electric power plant.

Device invented for feeding air to airplane engines at atmospheric pressure regardless of altitude, making possible higher records in altitude flights.

Empty airplane flown under radio control by another plane at Dayton, Ohio.

U. S. Hydrographic Office announced "double-tracking" of the Pacific Ocean to avoid traffic accidents.

C. Francis Jenkins, Washington inventor, sends photographs five miles by radio.

The first rigid airship to be built in America, the Navy fleet airship U. S. S. *Shenandoah*, formerly known as the ZR-1, was successfully launched and tested, using helium gas for inflation.

The success of night flying and carrying of mails was demonstrated by five day test by the Air Mail Service in which mail was transported across the continent both ways in from 27 to 30 hours.

A non-stop flight across the continent was made by an Army T-2 airplane which previously established an endurance record of 36 hours.

A new official speed record of over 4 miles a minute, 243.67 miles an hour, was established by Navy aviators at the Pulitzer races, and subsequently 266.6 miles per hour on a straight-away course was achieved.

LIFE HISTORY OF CHIGGER

ANOTHER chapter in the life of the chigger has been observed and the eradication of this summer pest brought closer by a discovery of Dr. H. E. Ewing, of the Division of Insects of the U. S. National Museum. Dr. Ewing reports that he has found the hitherto unknown full grown form of the common chigger, together with strong indications that the rabbit is largely responsible for its spread.

The adult chigger has long been known to entomologists as *Trombicula*, a harvest mite which lives in the soil. In finding this mite most frequently associated with the tiny red larval form familiar to the picnicker in the woods, Dr. Ewing suspected its identity. He collected a number of *Trombiculae* and bred them in captivity. The resulting young were the characteristic red chigger about one fiftieth the size of the adult mite, which is orange-red in color and about as large as the head of a pin.

From the chigger stage of life the insect passes first into a nymph stage for a few weeks and then to the adult stage. The insect lives about ten months in the adult stage and is almost amphibious, requiring a great deal of moisture. Dr. Ewing plans to attack these mites in experiments at the Pennsylvania State Forest Camp near Stone Valley, Huntington County, Pa. By raking over the soil, letting it dry, and by using sulphur, he hopes to free the site from chiggers.

The indications are that there is but one generation a year, and if the adults can be exterminated by depriving them of moisture, the chigger may be checked. Another possibility of control is by getting rid of the rabbits. Although it is not definitely known yet whether rabbits are the only animal which is the natural host of the chigger, the indications are that it is the principal one.

Dr. Ewing tried raising chiggers on men, field-mice and other animals. After swelling up with a full meal of the blood-serum of man, and most other animals, they drop off. Chiggers never bury themselves under the human skin as was formerly supposed, but merely attach themselves by their mouth parts to the outer skin.

The chigger is not known to carry any disease to man in this country, but the Japanese chigger is held responsible for transmitting the very serious and prevalent "flood fever" of that country which is similar to the Rocky Mountain spotted fever in this country.

AN INTERNATIONAL AUXILIARY LANGUAGE

Science Service

A MOVEMENT to form a strong popular organization devoted to language in general and international auxili-

ary language in particular was reported to the American Association for the Advancement of Science by its Committee on an International Auxiliary Language.

One of the chief aims of the proposed International Auxiliary Language Association would be to secure adequate support for thoroughgoing scientific study of linguistic problems by the most competent experts and institutions. Preliminary steps toward a permanent organization have been made in meetings at New York and the international language problem is being studied in universities and private schools in New York City.

In a program devoted to international language, Joseph Bartlett, instructor in French at Antioch College, told how Esperanto is being used among the blind. Mr. Bartlett, who is himself blind, is actively engaged in working among the blind in all parts of the world through the use of Esperanto. Esperanto books for the blind are proving especially important in Brazil, because of the small number of Portuguese books in Braille.

J. W. Hamilton, of St. Paul, Minn., presented the possibilities of a simplified form of English, called Cosmo-English that has proved especially useful in teaching foreigners.

"The modern world of science, technology and commerce has become truly cosmopolitan," said Eugene F. McPike, of Chicago, in presenting a paper on "Inter-language." "Knowledge is without nationality. Trade is international. But the different peoples are in great need of a common medium of inter-comprehension. And this they may wish for and obtain without departing from patriotism or imperilling national safety. Nor do they have to surrender any of their priceless treasures of achievement."

ITEMS

Science Service

A COMPLETE diet may be built around a quart of milk as a nucleus, according to Dr. Alonzo E. Taylor, director of the Food Research Institute of Stanford University and member of the Food Administration during the war. Using milk instead of water it is possible, Dr. Taylor said, to make a loaf of bread that contains all elements and vitamins needed for health and nutrition, if a few additional substances are mixed with the dough. The organs of animals make better balanced rations and include more vitamins than muscle tissue.

THE U. S. Hydrographic Office is now constructing a chart of currents of the world which will "save millions of dollars each year for the owners and will shorten the number of days at sea of the ship taking advantage of the route which has the most favorable currents." To aid this work, Navy Department officials have requested all captains to throw over bottles containing drift report papers every four hours during their voyages. When picked up and reported these papers will give data for the chart.

FORECASTS of wheat production this year in sixteen countries of the Northern Hemisphere is about 1,878,000,000 bushels compared to 1,754,000,000 bushels last year.