

SCIENCE NEWS

*Science Service, Washington, D. C.*SOME ADVANCES IN THE SCIENCES
DURING 1934*(Copyright, 1934, by Science Service)**Astronomy*

SEVENTEEN hundred hitherto unreported variable stars, 1,000 in the Small Magellanic Cloud and 700 in our own Milky Way, were found during Harvard researches.

The average temperature of the interior of the sun is 12,000,000 degrees Centigrade and the maximum is 21,000,000 degrees, as computed theoretically by Sir Arthur Eddington.

Motion pictures of a 25,000-mile "bomb" shot out from a sun-spot were made by Robert R. McMath and R. M. Petrie, at the McMath-Hulbert Observatory of the University of Michigan, by means of the spectroheliocinematograph.

The sun's counter-glow or "Gegenschein" consists of two parts, an inner glow due to a dust ring inside the earth's orbit, and an outer glow due to dust ring outside the orbit of Mars is proposed by Dr. Cuno Hoffmeister of Babelsberg.

Phosphorus, fifty-ninth of the 92 elements to be found in the sun, was identified by Dr. Charlotte E. Moore, of Princeton, using solar spectrograms made by Dr. Harold D. Babcock, of the Mount Wilson Observatory, and phosphorus spectra by Dr. C. C. Keiss, U. S. Bureau of Standards.

A faint diffuse emission line agreeing in position with the green coronal line was found by Harold D. and Horace W. Babcock, of the Mount Wilson Observatory, in spectra of the solar chromosphere taken without an eclipse; the red coronal line was feebly present in absorption, and they found, in the far infra-red, an absorption line of helium and possibly one of ionized helium.

Extreme ultra-violet solar radiation that leaks through the terrestrial atmosphere between the absorption bands of ozone and those of normal molecular oxygen was detected with sensitive photoelectric equipment by Edgar Meyer, Marcel Schein and B. Stoll, of the University of Zurich, observing from Switzerland's Jungfrauoch.

The total solar eclipse of February 14-13, 1934, the paradox eclipse that ended the day before it began because it crossed the international date line, was observed successfully by Japanese and American astronomers from Losap Island in the Pacific.

A change in the magnetic field of the earth during the February total solar eclipse was detected by Commander Akiyosi of the Japanese Naval Hydrographic Office.

Hidalgo, the asteroid that moves like a comet, was re-discovered in October at Simeis Observatory, Russia.

Comets or other objects sighted included: Reinmuth's comet of 1928 rediscovered by Dr. H. M. Jeffers, of Lick Observatory, Encke's comet also picked up by Dr. Jeffers, an unusual object sighted by L. Boyer from Algiers Uni-

versity Observatory, Schwassman-Wachmann's Second Comet rediscovered.

Failure of a brilliant November meteor display made astronomers suggest the earth has lost touch with the densest part of the Leonid meteor swarm.

Unusual meteoric fireballs flashed over New England on September 26 and over Maryland, Pennsylvania and New Jersey on October 17.

Pluto, farthest planet, discovered in 1930, according to Dr. Walter Baade, of Mount Wilson Observatory, is about the size of the moon.

Two white spots on the planet Jupiter were discovered in April, one by a Berlin amateur and another by Professor J. J. Nassau, of Warner and Swasey Observatory in Cleveland.

That Jupiter and Saturn have atmospheres consisting largely of the deadly gases, methane and ammonia, is shown by researches made by Dr. V. M. Slipher of Lowell Observatory, Dr. Arthur Adel of the University of Michigan, Dr. Rupert Wildt of Göttingen and Dr. Theodore Dunham, Jr., of Mount Wilson Observatory.

Life on Venus was pronounced unlikely when Mount Wilson Observatory studies by Dr. Walter S. Adams showed absence of oxygen or water above its dense surface-hiding clouds.

Venus has 10,000 times as much carbon dioxide as the earth, Dr. Arthur Adel, of the University of Michigan, concluded from a comparison of planet and laboratory absorption bands.

The great red spot on Jupiter is a great island of frozen ammonia floating on a sea of liquid hydrocarbons, like ethane, ethylene and acetylene, according to a postulate of Dr. Arthur Adel, of the University of Michigan, and Dr. V. M. Slipher, of Lowell Observatory.

Comets and meteors can be shown with the Zeiss planetarium through use of a new device.

A television-photoelectric scanning of the uneclipsed sun will reveal the corona without waiting for total solar eclipse, is the suggestion of A. M. Skellett, of the Bell Telephone Laboratories.

Aluminum came into use as telescope mirror coating, Dr. John Strong, of the California Institute of Technology, so treating Lick's Crossley reflector and making preparations for aluminizing the Mount Wilson 100-inch mirror.

Scratch-proof telescope mirror coatings were made by Robley C. Williams, of Cornell University, by evaporating a layer of chromium and then a reflecting layer of aluminum on the glass.

The 200-inch telescope progressed as follows:

Two 200-inch glass disks were poured at Corning, N. Y., for the main mirror.

Grinding of the 120-inch flat for testing the 200-inch began at Pasadena, Calif.

Palomar Mountain, northeastward 45 miles from San Diego, elevation 6,126 feet, was selected as the site.

An 85-inch glass disk for the University of Michigan Base Lake telescope and an 82-inch disk for Texas' McDonald Observatory were poured at Corning, N. Y.

The new 40-inch U. S. Naval Observatory telescope made by George W. Ritchey went into service.

A new wide-angle photographic telescope was planned for Lick Observatory.

A new observatory building was completed at Princeton.

The invention of the Schmidt telescope allowed the use of spherical mirror with a slightly figured flat correcting plate instead of paraboloid which is more difficult to make.

Geology and Geography

A new estimate of the earth's age, 1,725,000,000 years, was made by Miss Edith Kroupa, of the University of Vienna, as the result of microchemical analysis of radioactive rock from near Winnipeg, Canada.

Important paleontological finds included two great mass deposits of fossils, one of dinosaurs near Billings, Mont., the other in a German lignite mine, both probably the records of wholesale death in a long-past drought; a "quarry" of horse fossils near Hagerman, Idaho; large numbers of extinct pigs in South Dakota; a nearly complete marine dinosaur near Whitewood, S. D.; fossils of a small horse and a giant mammoth near San Diego, Calif., and the fossil bones of an eagle, in Wyoming.

Two fossil skulls, almost midway between reptiles and mammals, now in the Bloemfontein Museum, S. A., were pronounced one of the most important of all known evolutionary links, by Dr. D. M. S. Watson of the University of London.

Two woolly mammoths, complete with hair and flesh, were found in the age-long frozen soil of northern Russia.

A record for deep-sea diving was established on August 15 when Dr. William Beebe and Mr. Otis Barton reached a depth of 3,028 feet in the bathysphere in the waters off Bermuda.

Abyssal submarine canyons off the coast of California were investigated by Professor Francis P. Shepard, University of Illinois, collaborating with the U. S. Coast and Geodetic Survey and several California institutions.

A tremendous canyon, like that of the Colorado, was found in an inaccessible part of Mexico, by a California Institute of Technology expedition under R. T. Moore.

Calculations based on the effects of high-velocity bullets support the theory that Meteor Crater and similar great pits were caused by the instantaneous evaporation of impacting meteorites, as reported by Professor C. C. Wylie of the University of Iowa.

Halemaumau Pit, in Kilauea volcano, broke into a spectacular eruption on September 6.

The city of Tiberias, on the Sea of Galilee, was devastated by a storm and flood on May 14.

Samples of air taken in the stratosphere flight in the U. S. S. R. showed that its composition at great heights is approximately the same as at ground level.

The research ship *Atlantis* conducted a scientific survey of the fabled Sargasso Sea.

An international geographical congress, under the presidency of Dr. Isaiah Bowman, American geographer, was held in Warsaw, August 23 to 31.

The first report of a Land Use Committee, of the Science Advisory Board, who are making a comprehensive scientific study of the country's natural resources, was presented to President Roosevelt on December 1.

Checking the alarming progress of erosion of the nation's best farm, range and forest lands was undertaken as a leading part in the program of public works.

The U. S. Weather Bureau is extending, with the cooperation of the Army and the Navy, systematic daily high-altitude airplane flights to obtain upper-air meteorological data, to use in the air-mass analysis of current weather.

Geologic effects of the great drought included a dust storm that covered half the country in mid-May, notable low levels in rivers and lakes, and diminished activity in many of Yellowstone Park's geysers and hot springs.

There were hundreds of icebergs in the North Atlantic during the spring but none of them got as far south as the main steamer lanes.

Two masses of rock fell off the face of Niagara.

Only three major tropical storms occurred in West Indian waters, but typhoons in the East Indian region were numerous, and several of them highly destructive.

There were 37 earthquakes of sufficient intensity to affect far-distant seismographs, several of them destructive to life, as in India on January 15, in Afghanistan on June 14 and in Honduras on December 2; in Utah a strong quake tore open the earth and produced fountains of brine.

The Soviet Government energetically pushed its program of Arctic exploration.

Severe floods occurred in Poland during July.

An expedition under the leadership of Martin Lindsay crossed from Jakobshavn on the west coast of Greenland to the vicinity of Scoresby Sound and thence south to Angmagssalik, on what was the real objective of the trip—the exploration of 350 miles of the hinterland of the East Greenland coast.

The city of Nome, Alaska, was destroyed by fire on September 17.

On November 16 a new building of the Scott Polar Research Institute was formally opened in Cambridge, England.

A deed of transfer of the territory of the disputed town of Leticia to Colombia by the commission appointed by the League of Nations was signed on June 19.

A new railroad line connecting Brazzaville on the Congo with Pointe-Noire on the seacoast of French Equatorial Africa was opened during the summer.

A section of the frontier between Libya and the Sudan, not previously demarcated, was defined in an agreement between the British and Italian governments.

Medicine

A triumph of obstetric and pediatric practise was the successful delivery and rearing, with every prospect after six months of continued life and health, of the Dionne quintuplets; credit for this medical triumph belongs to

Dr. A. R. Dafoe, Canadian "country doctor," who struggled against great odds to save the mother and all five baby girls.

Progress in the fight against infantile paralysis was marked by reports of successful use in humans of two vaccines against the disease, one developed by Dr. Maurice Brodie, of the New York City Health Department, and the other by Dr. John A. Kolmer, Temple University Medical School, Philadelphia.

An anti-influenza horse serum, successful in mice, and a method of using these common laboratory animals for influenza studies were reported by Drs. C. H. Andrews, P. P. Laidlaw and Wilson Smith, National Institute for Medical Research, London.

A method of protecting against encephalitis, popularly called "sleeping sickness," but so far applied only to mice, was developed by Drs. Leslie T. Webster and George L. Fite, Rockefeller Institute for Medical Research.

Vaccination against parrot fever or psittacosis was announced by Dr. Thomas M. Rivers, Rockefeller Institute for Medical Research; seven laboratory workers were first to be given this protection which is not considered practicable as yet for the general population.

Isolation and preparation of the pure substance made by the tubercle bacillus that is responsible for the tuberculin skin test in man and animals was announced by Dr. Florence Seibert, Henry Phipps Institute, Philadelphia.

A new explanation of the cause of glandular diseases, such as exophthalmic goiter, which suggests revision in the method of treating these diseases, arose from the discovery by Dr. J. B. Collip and associates at McGill University that the body develops resistance to certain hormones after prolonged administration, probably because of the presence of anti-hormones.

Tremendous precocity of growth and development in successive generations of rats as a result of treatment with thymus gland extract and dwarfism in rats as a result of treatment with pineal gland extract, showing that normal stature apparently depends on proper balance between thymus and pineal glands, was obtained by Drs. Leonard G. Rowntree and J. H. Clark, of the Philadelphia Institute for Medical Research, and Dr. A. M. Hanson, Faribault, Minn.

Cortin, the life-saving hormone of the adrenal gland cortex, was obtained in pure crystalline form for the first time and its chemical formula discovered, as announced, by Dr. E. C. Kendall, Mayo Foundation.

Sterility was cured in a significant proportion of human beings by giving to one or other parent an endocrine gland preparation to make up for hormone deficit, was reported by the late Dr. Allan Winter Rowe, Evans Memorial Hospital, Boston.

The molecular weight and composition of the substance in the thyroid gland, the absence of which causes goiter, was determined by Dr. Michael Heidelberger, Columbia University, New York City.

In the posterior pituitary gland a new factor, probably a new hormone, which controls the activity of the acid-secreting cells of the stomach and may therefore be of

interest in connection with the production of stomach ulcers, was discovered by Drs. E. C. Dodds, R. L. Nole and E. R. Smith, Courtland Institute of Biochemistry, London.

Success in the treatment of the mental disease, involutional melancholia, by the sex hormone, theelin, was reported by Dr. August A. Werner and associates at St. Louis University School of Medicine.

A method for and preliminary results of transplantation of living grafts of thyroid and parathyroid gland tissues in human patients were reported by Drs. Harvey B. Stone, J. C. Owings and George O. Gey of the Johns Hopkins Medical School, Baltimore.

That amidopyrine and chemically related headache and pain-relieving remedies are one if not the sole cause of agranulopenia, fatal bone marrow disease which has been on the increase in recent years, Drs. F. W. Madison and T. L. Squier, Milwaukee, reported and research by many other scientists including Drs. Roy R. Kracke and Francis P. Parker, Emory University, confirmed.

A substance in the kidney excretion of expectant mothers that produced a tenfold decrease in the growth of cancers in mice was discovered by Drs. Henry J. Ullmann, Fritz Bischoff and Richard D. Evans and L. C. Maxwell, chemist, Santa Barbara, Calif., Cottage Hospital, the International Cancer Research Foundation, Philadelphia, announced.

The cancer-producing property of mineral oil is related closely to the oil's refractivity constant, Dr. C. C. Twort and J. W. Twort, of the Manchester, Eng., Committee on Cancer, found; selection or treatment of lubricating oils with this fact in mind may result in lessening of skin cancer among textile workers, known as mule spinners' cancer, they suggested.

One of the normal constituents of the body, a bile acid, was transformed by simple chemical means into a cancer-producing substance by Dr. J. W. Cook and associates at the London Free Cancer Hospital under a grant from the International Cancer Research Foundation.

The venom of an Indian snake, *Vipera russelli*, contains a substance which very rapidly clots both normal and hemophilic blood in the test tube and which was successful in checking bleeding after dental and other operations in both normal and hemophilic patients, Dr. R. G. Macfarlane, St. Bartholomew's Hospital, London, and Burgess Barnett, curator of reptiles, Zoological Society of London, reported.

Ability to hasten blood-clotting and thus to control hemorrhage is a property of human milk, fresh or dried, but not of milk from other animals, Professor A. Solé, of Vienna, reported.

Deaths from peritonitis, often fatal infection following abdominal operations, may be reduced by vaccination with a concentrated fraction of bovine amniotic fluid, Drs. Herbert L. Johnson and Edward L. Young, Boston, announced.

A derivative of morphine, dihydrosesoxymorphine-D, made by Dr. Lyndon F. Small, University of Virginia, was patented and will be manufactured under government license for use on patients in order to determine whether it is habit-forming like morphine.