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40th Anniversary Troop 15.

1). Honor to attend & represent
those who were members of our
Troop. from 1924-1929

a). Scoutmaster Chuck + Tom Hill

b). Eagle Train, Col Frank, Pitler,

2) In these days when all of
us are so preoccupied with:

Appropriate to see in company
what progress has been made
from those days 30 yrs ago

3). What does this prove?

Under a govt that guarantees
protects the rights of the individual,
where opportunity exists for learning,
PROGRESS can be made.

4). What is the Challenge of today?
Our frontiers are those of
Science
+
Service

Threshold of the greatest era
of Scientific advancement in
history of man.

Young men here are needed
in our laboratories

However if we are to derive
the maximum benefits we must
have those who will serve in the
Frontiers of Service.

Service in govt
" " the church
" " our schools.
" " civic organizations.

Speech: Boy Scout
Feb 8, 1958

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D. R. FORD LI
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SCIENCE NEWS

Science Service, Washington, D. C.

SCIENTIFIC PROGRESS DURING 1925

Agriculture

Chemical analysis of the cotton plant, and discovery that trimethylamine is the odorous substance that attracts the boll weevil, was reported by scientists of the United States Department of Agriculture.

Anthropology

A prehistoric skull, which may be another link in the chain of human evolution, was found at Taungs in South Africa. It is said to be older than the ape man of Java and half way between the higher apes and man.

Excavations in Florida revealed human remains closely associated with the bones of mammoth under circumstances thought to indicate that prehistoric elephants survived in America longer than previously supposed.

The Gobi Desert expedition of the American Museum of Natural History discovered in Mongolia abundant traces of Old Stone Age culture. Among other things, they learned that ancient man made ornaments out of the still more ancient dinosaur eggs.

Human remains of prehistoric times were found in a cave in Crimea together with skeletons of mammoths, cave hyenas and cave bears, characteristic of the later days of the Old Stone Age.

The skull of a hitherto unknown race of the Neanderthal type of ancient cave men was discovered near Capernaum in Galilee.

A French-American expedition explored northern Africa and found evidences of prehistoric men similar to those of southern Europe.

Dr. Edward Sapir, Canadian anthropologist, announced that he had discovered striking resemblances between American Indian dialects and the ancient Chinese language.

Ten prehistoric stone tombs containing valuable relics were unearthed from an ancient Indian mound near Cartersville, Georgia.

A hoard of valuable pearls was discovered in a prehistoric Indian mound in Ohio.

Archeology

An expedition to excavate Armageddon, famous ancient battleground in central Palestine, was organized by the Oriental Museum of the University of Chicago.

The Russian Geographical Society's expedition to Tibet returned with an extensive collection of ancient relics, some of which indicate that 2,000 years ago a Mongolian civilization flourished which had contact with Hellenic culture.

The antiquity of the Phoenician alphabet was set back from 850 B. C. to the fifteenth century B. C. by discovery of old inscriptions.

Astronomy

The total eclipse of the sun on January 24, 1925, was

found by Professor Ernest W. Brown, of Yale University, to have been four seconds late, due partly to uncertainty as to the moon's actual position in space.

The puzzling shadow bands which appear before and after total eclipses of the sun were traced to rising warm air currents by Dr. Charles Clayton Wylie, of Iowa University.

Studies based on this eclipse showed that the sun's corona is approximately 5,000 degrees Fahrenheit, or only half as hot as earlier calculations had indicated.

The total eclipse of the sun, which was visible along a path from Buffalo, through Ithaca, Poughkeepsie, New Haven and Nantucket, was observed by more than 20,000,000 people, more than ever before observed such a phenomenon. For the first time in history such an eclipse was observed from a dirigible balloon, the *Los Angeles*, of the U. S. Navy, by a party of astronomers from the U. S. Naval Observatory. Astronomers from the Harvard College Observatory, Mt. Wilson Observatory, Sproul Observatory of Swarthmore College, Allegheny Observatory, Lowell Observatory and others went to points along the path of totality to photograph it, while astronomers at Cornell University, Vassar College, Yale University and Wesleyan University observed it from their own observatories.

Many spectrum lines, indicating the presence of oxygen and other chemical elements, were photographed at the eclipse for the first time by Dr. H. D. Curtis, of the Allegheny Observatory at Pittsburgh. These photographs were of the flash spectrum, which can be seen just before and after a total eclipse, and of the corona, which is seen during totality. They were made by red and infra red light.

Astronomers from the Naval Observatory at Washington, the Sproul Observatory at Swarthmore College, the Allegheny Observatory at Pittsburgh, the Mt. Wilson Observatory in California, Harvard University, the U. S. Bureau of Standards and institutions in Europe, sailed for Sumatra to prepare for the observation of a total eclipse of the sun which will be seen there on January 14, 1926.

Photographs made by Dr. Edwin P. Hubble, of the Mt. Wilson Observatory, California, with the great 100-inch telescope showed that the spiral nebulae, and certain irregular nebulae, consisted of great swarms of stars at vast distances. The nearest are so far away that their light takes about a million years to reach us, and they were therefore shown to be "island universes," similar to our own stellar system of which the sun and the other stars in the Milky Way and also those seen in other parts of the sky are parts.

Eleven comets, an unprecedented number for one year, were discovered; two by American astronomers, Professor George Van Biesbroeck, of the Yerkes Observatory, and Leslie C. Peltier, an amateur of Delphos, Ohio; two others by amateur astronomers in South Africa and two in Russia. Some of the eleven were old friends returning on

one of their periodic visits, while others were new ones. A "nova," or new star, was discovered in the constellation of Pictor, the "Painter," in the southern skies on May 25 by an amateur astronomer in South Africa, named Watson.

The sun's present mass will supply light and heat for the next fifteen trillion years, and, as the sun may gather up more matter as it passes among the stars, it may continue longer, according to reports made to the American Mathematical Society. Study of sunspots in relation to weather continued, and Dr. H. H. Clayton, former head of the forecasting department of the Argentine Weather Service, predicted that other nations would follow Argentina's example in applying observations of solar radiation to forecasting.

The craters on the moon were caused by the explosions of millions of meteors, after hitting the moon with a speed as high as 50 miles a second, according to a new theory proposed by A. C. Gifford, of New Zealand. The theory that the moon is made of material that was once part of the earth's crust and that was peeled off by attraction of the sun was advanced by Dr. R. H. Rastall, at Cambridge University.

A branch of the Harvard College Observatory was established in the nitrate desert of northern Chile, the highest driest desert in the world, to aid in the observation of stars too far south to be seen from Cambridge. A branch of the Yale University Observatory was established in South Africa with the completion of a 26-inch refracting telescope. This observatory will supplement the work done at New Haven, Conn., by Dr. Frank Schlesinger, director of the observatory, in finding the distances of the stars.

Aviation and Aeronautics

The U. S. dirigible *Shenandoah* was wrecked by a storm in Ohio, with great loss of life.

An attempt was made by U. S. airplanes to fly to the Hawaiian Islands, but it was not successful.

A new type of airplane, the autogiro, invented in Spain, was tested and praised by the British Air Ministry. It obtains its lift in part by large propeller-like rotating wings.

Biology

A chemical test by which the sex of plants or animals can be determined from a few drops of plant juices or blood was worked out in Russia and applied by scientists of the Carnegie Institution of Washington.

Evidence that a severed optic nerve can reunite and at least partially recover its function was obtained by study of rats at the University of Chicago.

The pituitary gland was completely removed from dogs by surgeons of Johns Hopkins Hospital without killing the animals, an operation previously considered as productive of certain death.

Star-fish and sea urchins were developed from unfertilized eggs at the University of Chicago with only ultra-violet light for a father.

Silkworms were successfully vaccinated against a bacterial disease by Dr. R. W. Glaser, of the Rockefeller Institute for Medical Research.

A new method of killing protozoa, the minute animals that inhabit the digestive tracts and blood systems of man, animals and insects, by an overdose of oxygen, has been discovered by Dr. L. R. Cleveland, of the Johns Hopkins University. While these minute animals are often harmless and sometimes helpful, there are some that are the cause of such diseases as malaria, sleeping sickness and dysentery.

Success in preserving the last herds of American bison from extinction was reported from Canada.

For the first time, male sex glands were successfully transplanted in animals and made to persist in normal condition.

A scientific survey of America's fresh water food resources was inaugurated by the National Research Council.

Chemistry

Mercury was transmuted into gold. Professor A. Miethe, of the Berlin Technical High School, found that mercury vapor lamps became obscured after long usage by a sooty substance which on analysis proved to be partly gold. Artificial production of gold from mercury by the application of strong electrical forces was also announced by Professor Nagaoka, of Tokyo.

Dutch scientists claimed to have transmuted lead into mercury and thallium.

Methods of reclaiming old automobile oil were reported by several investigators.

Vitamin C, the preventive of scurvy, was obtained for the first time concentrated into crystalline form.

Two missing chemical elements, numbers 43 and 75, were discovered by means of spectra obtained by passing a beam of X-rays through concentrated solutions of rare minerals. Dr. Walter Noddack, of Berlin, the discoverer, named them masurium and rhenium.

Production of methanol, or wood alcohol, from coal, was invented and developed in Germany. Experiments with this German synthetic methanol, at the Harvard Medical School, showed it to be as poisonous as wood or methyl alcohol.

A new process by which "pure" aluminum—containing less than two one hundredths of one per cent. of impurity—can be made commercially, was reported.

Rare elements, such as lithium, vanadium and nickel, were found in petroleum ash in quantities sufficient to warrant their extraction from the ashes of petroleum cokes and to be used as future sources of these substances.

Evolution

The state of Tennessee passed a law forbidding the teaching of evolution in public schools and universities. The testing of this law, by the trial of John T. Scopes, of Dayton, Tennessee, in July, was one of the most dramatic events of the year. The verdict of the lower court was conviction. The constitutionality of the law will be tested before the Supreme Court of the state in January, 1926.

Life existed on the earth when the oldest known rocks were formed. Dr. John W. Gruner, of the University of Minnesota, found fossil remains of blue-green algae in

Archaean rocks which were once believed to have been formed by the direct cooling of a molten earth.

The biggest lot of dinosaur bones ever found in one place was unearthed in Tanganyika, formerly German East Africa.

Chemical affinities between the blood of apes and man, much closer than that between the tailed monkeys and man, was shown by serological tests at the Rockefeller Institute.

Evidence of the process of evolution actively going on was discovered in snails of the South Seas. The divergencies shown did not produce distinct species, but the existence of divergent individuals of adult growth showed "that mutation is a real and contemporaneous process."

Geography

The *Maud*, Captain Amundsen's ship, returned after three years of drifting in Arctic ice and Dr. Harald Sverdrup reported tidal observations that indicate there is no land in the unexplored Arctic area.

A great submarine current which runs from the North Atlantic and comes to the surface again 2,000 miles south of the equator was discovered by the German ship, *Meteor*.

Experiments to see whether ships could detect hidden icebergs by the sonic depth recorder were made by U. S. Coast Guard cutters.

Perfection of a new sounding device especially designed for speedy mapping of the ocean floor by means of echoes from the sea bottom was announced.

Geology

The City of Santa Barbara, California, was badly damaged by a heavy earthquake in June; another earthquake shook Montana and neighboring states at the same time. New England and eastern Canada were shaken by an earthquake on February 28.

The U. S. Coast and Geodetic Survey, the Jesuit Seismological Association and Science Service of Washington, cooperating with seismological observatories in the United States and foreign countries, have perfected a method of quickly and accurately locating the epicenters, or points of greatest motion, of earthquakes.

Foot prints of animals that lived twenty-five million years ago were found in primitive rocks 950 feet below the top of the Grand Canyon of the Colorado River. They are believed to have been crustaceans and amphibians.

Rich deposits of platinum have been found in the Transvaal.

Inventions

A boiler in which the flame burns in direct contact with water, thereby eliminating much of the heat loss common in other boilers, was invented by a Belgian scientist.

An airplane gasoline tank which can be completely riddled by explosive bullets without bursting into flames or leaking was developed in Vienna.

A system of musical stenography by which the full orchestrated score can be taken down as it is played was devised by M. Henry Raymond in Switzerland.

The rotor ship, which uses wind power by means of rotating cylinders instead of by sails, was invented in Germany by Dr. Flettner.

✓ C. Francis Jenkins, of Washington, D. C., reported that he had successfully sent moving pictures by radio from one room of his laboratory to another and that long range radio movies had been proved practicable.

Synthetic "wool" was commercially produced from wood by processing similar to that used in making rayon or artificial silk.

A gas mask effective against all poisonous gases, provided they are not too strongly concentrated, was developed by the U. S. Bureau of Mines.

Medicine and Physiology

The use of delicate electric needles to replace the surgeon's knife and render surgery less painful and dangerous was announced by Dr. Howard A. Kelly, of Johns Hopkins University.

A new chemical substance composed partly of arsenic and bismuth was found effective in the treatment of syphilis by scientists of the Pasteur Institute in Paris.

Successful use of radium in the treatment of leprosy was reported by the Kalihi Leper Receiving Hospital at Honolulu.

Eggs from hens deprived of sunlight were found to lack vitamin which prevents rickets in children, while the eggs of hens receiving sunlight had this important food factor.

Eggs do not have to be fresh to retain their vitamins, because nine-year-old eggs were still found rich in vitamin A, in experiments conducted by the U. S. Bureau of Chemistry.

The parathyroid gland, one of the ductless glands situated in the throat in the region of the Adam's apple, secretes a hormone that prevents tetany, a condition of spasms and stiffening of the muscles.

A new dietary factor that prevents pellagra has been found in fresh milk, brewers' yeast and fresh beef, by scientists of the U. S. Public Health Service.

(To be continued.)

ITEMS

A CAREFUL analysis of cancer statistics gathered by the U. S. Census Bureau over a period of about twenty years in ten Eastern states reveals definitely that cancer mortality is from 25 to 30 per cent. higher than it was about twenty years ago. This is the claim of Dr. J. W. Schereschewsky, of the U. S. Public Health Service, who made the statistical analysis and reported it to the American Medical Association. "There has been a pronounced increase in the observed death rate from cancer in persons forty years old and over in the ten states comprising the original death registration area," Dr. Schereschewsky said. "Part of this increase is due to greater precision and accuracy in the filling out of death returns, but the remainder is an actual increase in the mortality of the disease."

SCIENCE NEWS

Science Service, Washington, D. C.

SCIENTIFIC PROGRESS DURING 1925

(Continued)

Medicine

The causal organism of one type of cancer was isolated and photographed by means of the ultramicroscope, according to the claim of English workers.

The germ which causes distemper in dogs was discovered by Professor Robert C. Green, of the University of Minnesota.

Certain soil bacteria were found to have the same effect on plant growth as vitamins have on animal growth, by Dr. Florence A. Mockeridge, of Swansea, England.

A vaccine made from infected cattle ticks was found an effective protection against Rocky Mountain spotted fever.

Chicago bacteriologist found bacteria living in oil wells more than 1,000 feet deep. This is a record depth for living organisms on land.

Hoof and mouth disease of cattle was fought in Denmark with serum treatment instead of by slaughtering the herds.

Dr. A. Besredka, a Russian scientist working at the Pasteur Institute in Paris, discovered that deadly germs may be entirely harmless if planted in tissue on which they are not accustomed to prey.

An extract obtained from the liver of animals was found to be effective in lowering high blood pressure of human subjects and may prove to be as effective in its field as insulin is in treating diabetes.

Extract from the parathyroid glands was found to be useful in speeding up the healing of broken bones.

The causative organism of sleeping sickness, encephalitis lethargica, was, according to claims, identified as a minute filter passing organism.

A new synthetic substitute for cocaine which can be used as a local anesthetic, has been discovered in Germany. It was named "totokain" and is prepared from some of the intermediate products in the manufacture of artificial rubber.

The thymus gland, an obscure ductless gland in the neck, was found to have influence on egg production in the case of pigeons.

Rats from which the thyroid gland has been removed, and which were suffering from cretinism as a result, were made to grow normally again by extra doses of pituitary extract.

Propylene, a gas closely related to ethylene, was found to possess important anesthetic powers.

Vitamin E, the presence of which in foods is necessary for reproduction of offspring, was shown to be present in a large variety of vegetable and animal substances.

A process of quantitatively measuring the flow of the blood, sought for during the past two centuries, was discovered at Yale University.

The League of Nations established the broadcasting of health reports from a radio station in French Indo-China,

so that countries of the world might be kept informed of disease conditions, and warned of alarming changes in the plague areas of the Far East.

Complications from scarlet fever, such as inflammation of the joints, infections of the ear, nose and throat, can be avoided by early use of the antitoxin perfected by Dr. G. F. Dick and Dr. Abraham Zingher, according to reports made by them.

Milk, olive oil and some other foods which had been exposed to ultra-violet light were found to have the same curative effects on children suffering from rickets as doses of cod-liver oil or exposure of the patients themselves to ultra-violet rays.

Researches at the Carnegie Institution's Department of Genetics showed that determination of sex must be considered from a physiological, chemical and biological standpoint, and that changes in the rate of living of the organism may be even more fundamental in determining sex than the make up of the cell itself.

A new and powerful antiseptic, derived from the coal-tar product resorcinol and called "hexyl-resorcinol," was made by Dr. Veader Leonard, of Johns Hopkins.

A new X-ray machine, in which the photographic plate is exposed only when the heart is quiet between beats, made it possible to take clearer X-ray pictures of conditions in the lungs, was developed at the University of Pennsylvania.

A new cure for hookworm, as effective as carbon tetrachloride, was discovered by Drs. Maurice C. Hall and J. F. Shillinger, of the U. S. Department of Agriculture.

Physics

Penetrating radiation of cosmic origin was discovered by Dr. R. A. Millikan to be made up of "ultra X-rays" a thousand times shorter than the shorter and hitherto most powerful rays known. It is believed they are evidences of the formation of matter throughout all space.

Cathode rays, shot through a metallic window in a vacuum tube, were found to kill bacteria and insects and produce other striking physiological and physical effects.

Professor Gilbert N. Lewis announced a new theory of radiation based on the Einstein view of time, which makes a distant star and the eye-ball of an observer come into virtual contact.

A method for making sheets of steel so thin that they could be seen through like glass was invented by Dr. Karl Mueller, of Berlin.

Hafnium, one of the latest discovered chemical elements, has been found to be of practical value in the making of filaments in electric lights.

An ether drift experiment, by Professors A. A. Michelson and H. G. Gale, of the University of Chicago, in which the speed of two beams of light, one traveling east and the other west, when compared, indicated that the ether is not appreciably dragged along with the earth in its rotation, confirming Einstein's theory.

SCIENCE NEWS

Science Service, Washington, D. C.

SCIENTIFIC ADVANCES DURING 1927

ASTRONOMY

An amateur astronomer named Blathwayt, at Braamfontein, South Africa, discovered a new comet on January 13.

An amateur astronomer, William Reid, of Rondebosch, South Africa, discovered a new comet on January 26.

The Pons-Winnecke comet, which made one of its sexennial visits to the earth's neighborhood, was detected on March 3 by Dr. George Van Biesbroeck, of the Yerkes Observatory, Williams Bay, Wis. It came within 3,500,000 miles of the earth on June 27, close, with one exception, than any comet had been known to come in the past.

A new comet was discovered on March 10 by Dr. Carl L. Stearns, of the Van Vleck Observatory of Connecticut Wesleyan University.

The Grigg-Skjellerup comet was discovered on March 30 by Dr. George Van Biesbroeck, of the Yerkes Observatory.

An Australian justice of the peace and amateur astronomer, Walter F. Gale, discovered a new comet on June 7.

Schaumasse's periodic comet was observed on its return on October 4 by Professor Van Biesbroeck, of the Yerkes Observatory, and possibly by Gerald Merton, of the British Royal Observatory, a little earlier.

Encke's comet, a periodic visitor, was found on November 12 as it came near the earth again, by Professor George Van Biesbroeck, of the Yerkes Observatory.

A naked-eye comet visible in both the northern and southern hemispheres was discovered on December 3 by J. F. Skjellerup, Australian amateur, and was visible just before Christmas.

A new star was located in the Milky Way by Dr. Max Wolf, of the Heidelberg Observatory in Germany.

A comet and a nova, or new star, were discovered within three days by two German astronomers, Drs. A. Schwassman and Wachmann.

Professor Joel Stebbins, of the University of Wisconsin, announced the discovery that the satellites of Jupiter always keep the same side turned toward their parent planet, just as the moon does toward the earth.

An eclipse of the sun on June 29, visible in England and Norway, was seen at certain points along the path of totality by astronomers from the British Royal Observatory and the Hamburg Observatory in Germany, though American astronomers in Norway were unable to see any of it on account of cloudy weather.

The aid of the Canadian Mounted Police, Catholic missionaries to the Eskimoes, fur trappers and others was asked by Dr. Willard J. Fisher, of the Harvard College Observatory, in observing the total eclipse of the moon on June 15.

Discovery of just how the solar radiation varies was announced by Dr. C. G. Abbot, of the Smithsonian In-

stitution. Many large sunspots were observed, and magnetic storms on the earth took place in apparent conjunction with them.

The possibility that stars may be liquid was advanced by Professor J. H. Jeans, English astronomer.

Basalt, a rock common on the earth, is not present on the surface of the moon, Dr. Fred E. Wright, of the Carnegie Institution, told members of the National Academy of Sciences.

"The sun and the near-by stars may be in a vast cloud of cosmic 'dust,'" said Professor Edward S. King, of the Harvard Observatory, "thus causing the more distant stars to appear redder than the nearer ones," an effect that has actually been observed.

The radius of the universe was estimated as one hundred million light years by Professor E. T. Whitaker, of Edinburgh University, in a report to the British Association for the Advancement of Science.

In the hands of amateur astronomers in all parts of the world, his invention of the spectrohelioscope may go far towards solving outstanding solar mysteries, Dr. George Ellery Hale, honorary director of the Mt. Wilson Observatory, declared.

A 60-inch reflecting telescope, the largest in the southern hemisphere and the third largest in the world, was ordered for the new South African station of the Harvard College Observatory, which will replace the former station at Arequipa, Peru.

The solar wave-lengths in the unexplored regions of the spectrum were mapped by the U. S. Bureau of Standards in cooperation with Allegheny Observatory.

The largest disk of optical glass ever cast in the United States was made by the U. S. Bureau of Standards, the reflecting telescope blank being of borosilicate crown glass, 70 inches in diameter and 12½ inches thick.

PHYSICS

A new theory of the mechanics of atoms was enunciated by the Swiss physicist, Schrodinger, which, in brief, holds that electrons and other units of matter are wave systems like ordinary light and X-rays.

The 1927 Nobel prize for physics was awarded jointly to Professor Arthur H. Compton, of the University of Chicago, and Dr. C. T. R. Wilson, of the University of Cambridge, for their researches on X-rays and radium radiation.

The tercentennial of the death of Isaac Newton was celebrated by scientists all over the world.

Dr. Dayton C. Miller, of the Case School of Applied Science, at Cleveland, Ohio, repeated experiments that may show that the earth is drifting through the ether.

Sound-waves vibrating far too rapidly to be heard produced such curious effects as the emulsion of a candle in water, Professor R. W. Wood, of the Johns Hopkins University said, in describing to the National Academy of Sciences work which he had performed in collaboration with Alfred L. Loomis.

Cathode rays from the tube recently invented by Dr. W. D. Coolidge, of the Research Laboratory of the General Electric Company, have been found to be like sunlight in their power to give certain substances the quality of preventing rickets.

An instrument known as the thermionic microammeter, able to measure one five-billionth of an ammeter, was developed by the laboratory of the General Electric Co., at Lynn, Mass.

The grid glow relay, invention of D. D. Knowles, Westinghouse engineer, which operates on a billionth of a watt of electrical power, was demonstrated.

Discovery of a new electrical insulator was announced by Dr. Abram Joffe, a Russian scientist visiting the United States.

A highly successful process of television, by wire and radio, the development of the Bell Laboratories under the direction of Dr. Herbert E. Ives, was demonstrated on April 7.

The televox, an apparatus by which the telephoned note of a tuning-fork can be used to extinguish lights, start and stop electric fans, and operate other devices, was exhibited by its inventor, R. J. Wensley.

The non-magnetic ship Carnegie was overhauled preparatory to a lengthy scientific cruise to begin next year.

Metal shrinks when it is magnetized, Professor S. R. Williams, of Amherst College, stated.

The conclusion that nebulium, the strange "element" supposed to exist in such bodies as the great cloud of glowing gas in the star group of Orion, is merely oxygen and nitrogen was reached by Dr. I. S. Bowen, of the Norman Bridge Laboratory of Physics.

Dr. Paul R. Heyl, of the U. S. Bureau of Standards, announced the determination after three years' work of the Newtonian constant of gravitation as the fraction 6.664 over a hundred million; a value ten times more accurate than the previously accepted value.

The "quantum," the "atom" of which modern physicists suppose that light and other radiations consist, may be divided was indicated by experiments by Dr. A. J. Dempster, of the University of Chicago.

The wind velocity of the hurricane that wrecked Miami on September 18, 1926, was determined as 132 miles an hour, which was stated to be the highest on record, by Benjamin C. Kadel of the U. S. Weather Bureau.

CHEMISTRY

Experiments by H. S. Cooper, of Cleveland, Ohio, showed that the light-weight metal beryllium or its alloys is suitable for airship frames and light-weight pistons.

The new chemical element rhenium was obtained in pure form by its original discoverers, Drs. Walter and Ida Noddack.

Metallic vanadium was obtained for the first time by J. W. Marden and M. N. Rich, of the Westinghouse Lamp Co.

A record making deposit of borax, in the form of a new mineral called rasorite, was discovered in California by C. M. Rasor.

Professor David I. Macht, of the Johns Hopkins University, announced that polarized light speeded the

growth of certain plants and had other effects on life.

That the germs of tuberculosis contain a previously unknown compound, a phosphorous-containing fat, was discovered by Professor R. J. Anderson, of Yale University.

Making of synthetic rubber from coal on a commercial scale was announced by the German chemical trust.

Electroplating of rubber from latex or colloidal solutions of rubber was developed upon an industrial scale.

Hydrogenation of coal to produce liquid fuels resembling petroleum reached the point of commercial application.

Progress in the further synthesis of chemicals from cheap raw materials was made.

Cornstalks were utilized experimentally as a source of cellulose for paper and artificial silk.

New denaturants for alcohol were developed, some of them being produced by synthesis from petroleum products.

The U. S. Bureau of Standards discovered that duralumin can be protected against corrosion by coating with pure aluminum.

ENGINEERING

The U. S. Army developed a new fire-control instrument for anti-aircraft artillery, which makes it possible for one man to aim any desired number of guns.

A new 3-inch anti-aircraft gun firing 15-pound shells at the rate of about one every two seconds was developed by the U. S. Army.

The six-mile Moffat tunnel under James Peak, Colo., was completed.

The Holland vehicular tunnel between New Jersey and New York City was opened to traffic.

The United States Steel Corporation inaugurated an extensive program of research into the fundamental problems of the industry.

A device for detecting one part of mercury in 20,000,000 parts of the atmosphere was developed by the General Electric Company.

Diphenyl oxide, a white chemical with a powerful odor like geraniums, was experimented with as a substitute for water in steam boilers, in an endeavor to increase their efficiency.

More durable paper currency resulting from tests of the U. S. Bureau of Standards resulted in estimated savings of one million dollars a year.

An acoustical plaster which absorbs most of the sound falling upon it was developed by the U. S. Bureau of Standards.

Methods of making low-cost roads of gravel, sand and clay were developed.

GEOLOGY AND GEOGRAPHY

Scientists of twenty-five nations, meeting at Prague, passed resolutions recommending an international co-operative study of "ocean deeps."

Floods in the lower Mississippi Valley and in New England were the worst that had ever been recorded.

That the Mississippi floods may be due to the gradual sinking of the lower valley of the river, closer and closer to sea-level, was suggested by Dr. David E. White, geolo-

gist of the National Research Council and the U. S. Geological Survey.

Disastrous tornadoes struck Louisiana, Mississippi, Texas, Oklahoma, Illinois, Arkansas, Kansas and Missouri; St. Louis was particularly damaged.

Large quantities of oil may be deposited below the bottom of the sea, said Dr. Parker D. Trask, of the American Petroleum Institute.

Discoveries of potash salts in Texas and New Mexico thick and rich enough for mines were discovered through test borings made by the U. S. Geological Survey.

Seven thousand square miles in southeastern Alaska were surveyed by aerial mapping through the cooperation of the Navy and the U. S. Geological Survey.

Two large areas in Alaska, totaling 7,800 square miles, were explored by scientists of the U. S. Geological Survey, discovering and mapping a high mountain region hitherto unknown and finding a volcano in eruption.

A great earthquake on May 22 in the Kansu province in interior China was announced to the world on the following day by Science Service, in cooperating with the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association, though it was not for many weeks later that actual reports from the devastated region reached civilization.

Other severe earthquakes during the year that were immediately located by the cooperation of these three bodies included those in Chile on April 14 and November 14; Japan, March 27; Alaska, on October 24, and California on November 4.

The heat of Kilauea, the world's largest volcano, was measured by means of borings made in its floor by Dr. T. A. Jaggar, director of the Hawaii Volcano Observatory.

BIOLOGY

A ten-million dollar war was waged against the European corn borer in the Corn Belt states by the Department of Agriculture and declared successful.

Three botanists, Dr. A. B. Stout, Dr. Ralph McKee and E. J. Schreiner, announced the development of a fast-growing hybrid poplar to meet the demands for wood pulp.

Cells, usually assumed to be short-lived, were found still living in the heartwood of redwood trees a century old, it was reported by Dr. D. T. MacDougal, of the Carnegie Institution of Washington, and Dr. G. M. Smith, of Stanford University.

Small amounts of copper were found to make low-grade muck lands highly productive, according to E. L. Felix, of Cornell University.

The Tennessee State Supreme Court, in a decision on the appeal in the famous Scopes case, declared the anti-evolution law constitutional, but so worded its decision as virtually to nullify the law. John Scopes was excused from paying the fine levied against him for violating the statute, because of an error on the part of the judge presiding at his trial.

Efforts made in thirteen states to pass anti-evolution statutes were unsuccessful.

X-rays applied to the reproductive cells of animals and plants were found to speed up the rate of evolutionary change over a thousand per cent. This work was done on fruit flies by Professor H. J. Muller, of the University of Texas, and on tobacco plants by Professor T. H. Goodspeed and Professor A. R. Olson, of the University of California.

Natural evolutionary changes in shell-fish within sixty years, producing distinctly recognizable animal varieties in a lake in Wisconsin, were reported by Dr. Frank C. Baker, curator of the museum of natural history of the University of Illinois.

Chemical affinities between the milks of related animals were discovered by Professor H. R. Marston, of the University of Adelaide.

Eggs of the marine worm, *Nereis*, were fertilized without fathers, by the use of an electric current, by Ware Cattell, of Memorial Hospital, New York City.

Dr. Barnett Sure, of the University of Arkansas, has shown by experiments with rats that a poorly nourished mother, whose bodily stock of vitamin B is subnormal, becomes unable to pass along this necessary food element to her nursing offspring.

The female sex hormone, or gland essence that causes typically feminine reactions and development in animals, was discovered in male animals as well as female, by Dr. Otfried O. Fellner, of Vienna.

The tuberculin testing of fowls to weed out avian tuberculosis was advocated by Dr. John R. Mohler, chief of the U. S. Bureau of Animal Industry, at the Third International Poultry Contest held at Ottawa, Canada.

Mathematic studies of athletic records show that the one for the 880-yard run should be most easily broken, according to the statement of Dr. Earle R. Hedrick, of the University of California.

Dr. Raymond Pearl, director of the Institute for Biological Research at the Johns Hopkins University, announced a theory based on laboratory observation of yeast, bacteria and fruit flies, that biological and human populations rise and fall in accordance with a universal law.

Congress passed a bill to provide for the collection and care of a herd of the nearly extinct Texas longhorn cattle in the Wichita National Forest, Oklahoma.

A program for the scientific study and administration of the great elk herds of the Yellowstone region was planned by a cooperative committee of the national, state and private bodies interested.

The First International Congress of Soil Science was held in Washington in June and attracted scientists from many foreign countries.

A serious plague of mice occurred in Kern County, Calif., during January and February.

A new mosquito poison based on formaldehyde and said to be the most efficient yet devised, was announced by E. Boubaud, of the Pasteur Institute, of Paris.

Rediscovery of the straight-billed reed runner, a bird of Uruguay first noted by Darwin in 1831, of which all trace had been lost for nearly one hundred years, was made by C. C. Sanborn, of the Captain Marshall Field South American Expedition of the Field Museum.



SCIENCE NEWS

Science Service, Washington, D. C.

SCIENTIFIC EVENTS OF 1926

PHYSICS

Dr. W. D. Coolidge, of the General Electric Company, demonstrated a new cathode ray tube, with which these rays are for the first time obtained in quantity outside the tube. The effect of the tube is estimated to be equivalent to a ton of radium.

Professor A. A. Michelson, of the University of Chicago, announced his new determination of the speed of light as 299,736 km. or 186,284 miles per second.

Helium was prepared in solid form at a temperature of 457 degrees below zero Fahrenheit by Professor W. H. Keeson, of the University of Leyden, Holland.

Magnetism of hydrogen atom was measured by Drs. J. B. Taylor and T. E. Phipps, of the University of Illinois.

The penetrating cosmic rays vary daily with the aspect of the heavens according to Dr. Werner Kolhoerster, German physicist.

Experiments made by means of midnight balloon ascensions in Belgium showed no ether drift, thus substantiating the Einstein relativity theory.

Dr. Roy J. Kennedy, of the California Institute of Technology, repeated the Michelson-Morley experiment and obtained no evidence of ether drift.

Experiments by Dr. Carl T. Chase, of the Norman Bridge Laboratory of Physics, at Pasadena, gave support to the Einstein theory of relativity in opposition to Dr. Dayton C. Miller's results.

Experiments by Dr. Rudolph Tomaschek, of the University of Heidelberg, Germany, fail to confirm the ether drift indicated by experiments of Dr. Miller at Mt. Wilson, California.

Dr. G. M. B. Dobson and Professor F. A. Lindemann, of Oxford University, showed that the temperature 50 miles above the earth is as high as that of a warm summer day.

A vacuum switch which stops immense electrical currents safely was devised in the new high-tension laboratory of the California Institute of Technology.

A new kind of vacuum tube with which electric currents can be amplified one billion times was developed by Dr. Albert W. Hull and H. N. Williams working in the research laboratory of the General Electric Company.

The sound of a single atom of radium was made audible to radio broadcast listeners when Dr. H. P. Cady, chemist of the University of Kansas, amplified minute electric currents 700 billion times.

The proposition that beats of a master pendulum of great precision might be signalled throughout the world by radio, so that all telegraphic, astronomical and radio instruments would be in exact tune with each other was urged by Albert Einstein before the League of Nations Committee on Intellectual Cooperation.

Dr. James Franck, of the University of Göttingen, and Dr. Gustav Hertz, of the University of Halle, divided the

1925 Nobel physics prize and Professor Jean Baptiste Perrin, of the Sorbonne, Paris, was awarded the 1926 Nobel prize for physics.

Professor Niels Bohr, physicist, received the Franklin Medal from the Franklin Institute, Philadelphia, for his work on the structure of the atom.

Dr. W. D. Coolidge, inventor of the type of X-ray tube now almost universally used in hospitals and laboratories, was awarded the Howard N. Potts Medal of the Franklin Institute for his invention which "has simplified and revolutionized the production of X-rays."

CHEMISTRY

Hydrogen was transmuted into helium by Professor F. Paneth and Dr. Peters, of the University of Berlin.

Gold was claimed to have been transmuted to mercury by Dr. A. Gaschler, of the Berlin Technical High School.

Nitrogen is changed to fluorine and then to hydrogen and oxygen when hit by the nucleus of an atom of helium, Dr. William D. Harkins, of the University of Chicago, told the National Academy of Sciences.

Professor S. B. Hopkins, of the University of Illinois, discovered a new chemical element, No. 61 in the periodic table, and named it illinium.

Elements 75 and 43, reported discovered by Professor Walter Noddack, of Berlin, in 1925, have been relegated to the limbo of still undiscovered metals, by experiments at the Platinum Institute of the Russian Academy of Sciences which failed to substantiate the German results.

A synthetic drug called plasmochin, more powerful than quinine, was made in the Elberfelder Farbenfabriken.

Compounds analogous to chaulmoogra oil were made in the laboratory by Dr. Roger Adams, of the University of Illinois, and were found to act as an effective germicide against leprosy.

The valuable constituent of insulin was prepared in crystalline form by Dr. John J. Abel, of the Johns Hopkins University.

The first enzyme, one of an important class of substances involved in digestion, to be isolated was made in a crystallized form by Dr. James E. Sumner at the Cornell University Medical School.

An extract of the parathyroid gland, which controls the lime content of the blood, was prepared successfully from animal glands by A. M. Hjort and H. B. North, Detroit chemists.

Luminous flames radiate more heat than non-luminous flames, according to tests made by Professor R. T. Haslam and M. W. Boyer, of the Massachusetts Institute of Technology.

A new method of welding pieces of metal together was announced by Dr. Irving Langmuir, of the General Electric Company, by which hydrogen molecules are broken into atoms and recombined to give an intensely hot flame.

Methods for liquefying coal and obtaining motor fuel and other valuable products from coal were perfected by

Dr. Friedrich Bergius and Dr. Franz Fischer, of Germany, and by General Georges Patart, of Paris.

A process for making sugar from wood was developed by Professor Friedrich Bergius, of Heidelberg University.

Tests made by government chemists showed that a thin film of metallic chromium electroplated upon printing plates of finished steel or copper-nickel would make the plates wear longer than plates of hardest steel.

A world famine in rubber by 1930 was predicted by the U. S. Department of Commerce.

Commercial application of carbon dioxide ice for refrigeration purposes has reached the practical stage.

The wide-spread supplanting of cotton by rayon and similar fabrics made from wood began a revolution in American agriculture.

A project was set on foot to produce levulose sugar in large quantities from the roots of dahlias.

A system of zoning was evolved at the International Conference on Oil Pollution in an attempt to solve the problems arising from the discharge of waste oil by vessels at sea.

A set of world standards for gasoline and other liquid fuels was proposed at the meeting of the International Union of Pure and Applied Chemistry.

Professor Richard Zsigmondy, of the University of Göttingen, Germany, received the 1925 Nobel prize for chemistry and Professor Theodor Svedberg, of the University of Uppsala, Sweden, was awarded the 1926 prize.

Poland elected as its president Professor Ignatz Moscicki, well-known in the field of chemical engineering.

The American Chemical Society celebrated the fiftieth anniversary of its foundation.

A meeting of the International Union of Pure and Applied Chemistry was held at Washington, from September 13 to 15.

ASTRONOMY

Observable region of space was shown by Dr. Edwin Hubble, of Mount Wilson Observatory, to be a sphere of 140 million light years' radius, including some 2,000,000 nebulae, all of them embryo or grown stellar systems.

Mars came closer to earth than it will come again until 1939.

The temperature of the moon was found to be above boiling point when the sun is shining directly on it, by Dr. Donald H. Menzel, of the University of Iowa, as a result of observations at the Lowell Observatory in Arizona.

New evidence that our sun is a variable star was obtained by Dr. Charles G. Abbot, of the Smithsonian Institution, by means of a new system he devised for measuring and recording the changes in the energy reaching the earth from the sun.

American astronomical expeditions traveled to Sumatra to observe a total eclipse of the sun on January 14.

Some 125,000-mile long sunspots, the largest seen in years, were observed by Professor George H. Peters, of the U. S. Naval Observatory, in September.

An unusual display of sunspots, the largest being 45,000 miles in diameter and the largest group 150,000 miles long, was observed in October. Some of the spots could be seen with the naked eye through smoked glass.

Great increase in sunspot activity was marked on earth by auroral displays and magnetic storms, which caused much disturbance in radio and telegraphic communication.

Eight comets, two of which were new, were discovered during the year. One of the new ones was discovered in January by an amateur astronomer named Blathwayt in South Africa. The second was discovered by Dr. J. Coma-Sola, of Fabra Observatory, at Barcelona, Spain, in November.

A new star was found in a spiral nebula in the constellation Virgo by Professor Max Wolf, of Heidelberg.

A telescope with a 41-inch lens, to be the largest refractor in the world, was ordered by the Russian government from the Parsons firm in England.

BIOLOGY

Dr. James B. Sumner, of Cornell Medical College, isolated and crystallized the first enzyme, urease.

A "death whisper" consisting of highly intense "beams" of sound-waves too short to be audible, at frequencies as high as 300,000 per second, was shown by Professor R. W. Wood and A. L. Loomis to be capable of killing certain small animals and plants and to have other strange biological effects.

The human body grows in three distinct spurts, Dr. Charles B. Davenport, of the Carnegie Institution of Washington, told the National Academy of Sciences.

Eyes of an embryo chicken removed from the egg and planted in a culture medium continued to grow and develop in "a surprisingly normal way" according to two British physiologists, Dr. H. B. Fell and T. S. P. Strangeways.

The theory that vitamins have opposites, "toxamins," which occur in certain foods and prevent proper bone formation and cause serious nervous diseases, was advanced by Professor Edward Mellanby, of the University of Sheffield, England.

An eleven-day-old human embryo, the youngest human specimen ever available for observation, was studied and described by Dr. George L. Streeter, embryologist of the Carnegie Institution of Washington.

The mystery of the giant cells in the blood, which are present in tubercular conditions and some other pathological cases, was solved by Dr. W. H. Lewis, of the Carnegie Institution of Washington, who announced that these cells are formed by the fusion of a number of white blood cells.

An international school of fisheries was inaugurated at the University of Washington.

A fly imported from Europe to help save New England shade trees from two insect pests was found to be an enemy to 92 other insects as well.

White pine blister rust, which has for several years been devastating the pine forests of the East, was discovered to be threatening the white pine stands of the West.

New corn-harvesting machinery was invented to combat the spread of the European corn borer.

Individual cells that have lived as long as two centuries were discovered in Arizona cacti by Dr. D. T. MacDougal.

That plants will respond to strong light if it is flashed on them for as little as one one thousandth of a second was demonstrated by Dr. F. A. F. C. Went, of Utrecht.

Suction powers in vegetable growth as high as 500 pounds per square inch were demonstrated by Dr. A. Ursprung, of the University of Freiburg, Switzerland.

The discovery that plants, as well as animals, have in their cells the special bits of living matter known as the sex chromosomes, was announced by Dr. Kathleen B. Blackburn, British botanist.

The popular idea that big seeds are better than small ones was exploded by the experiments of Dr. Felix Kotowski, of the College of Agriculture at Warsaw, who showed that size of seed has no effect on the size of vegetables.

The relationship that plants bear to each other as branches of the evolutionary family tree was demonstrated by means of serum chemistry by Professor Karl Mez and Dr. H. Zeigenspeck, German botanists.

Luther Burbank died on April 11.

Plants living for months in hermetically sealed glass bulbs were exhibited to the National Academy of Sciences by Raymond H. Wallace, of Columbia University.

Anti-evolution bills were defeated in Louisiana and Kentucky.

Mississippi enacted an anti-evolution law.

MEDICINE

Partial immunization to measles, by means of injections of blood serum from persons who have had the disease and recovered, was claimed in a report to the League of Nations Health Committee.

The germ of oroya fever, or Peruvian fever, was isolated at the Rockefeller Institute by Drs. Hideyo Noguchi and T. S. Battistini.

Dr. E. B. Krumbhaar, of Philadelphia, announced the discovery that the spleen is an important source of the anti-bodies in the blood, which aid the body in resisting bacterial infection.

A skin test for susceptibility to infantile paralysis was originated by Dr. Edward C. Rosenow, of the Mayo Foundation.

Bacteriophage, the enemy of germs, discovered by Dr. F. d'Herelle, was declared by him to be a living parasite of parasites and not just a chemical factor.

Cause of creeping eruption was found to be a small parasitic thread worm by experts at U. S. Bureau of Entomology.

Mrs. Margaret R. Lewis, of the Carnegie Institution, and Howard B. Andervont, a Johns Hopkins University graduate student, discovered that a form of cancer occurring in chickens is the result of the white blood cells running wild.

Experiments on 50,000 mice by Dr. Maud Slye, of the University of Chicago, showed that resistance as well as susceptibility to cancer in mice is hereditary.

Virus from chicken sarcoma was found to be absolutely resistant to X-rays by workers at Cancer Research Laboratory at Middlesex, England.

Rat bite fever was found to be an effective cure for general paralysis or paresis.

The Pasteur Institute claimed that babies may be protected from tetanus infection by giving prenatal doses of tetanus anatoxin to mothers.

Indications were found that trachoma, a disease of the eye for which immigrants have been barred from entering the United States, is due to a deficient diet, by Dr. B. Franklin Royer, medical director of the National Committee for the Prevention of Blindness.

Two Prague scientists discovered a way of using washed animal blood in human transfusions.

By coating them with gold, Professor H. Bechold, German scientist, made visible minute bacteria formerly beyond the power of any microscope.

Polonium, the radioactive element isolated by Mme. Curie, was declared to be of possible use in treating syphilis as a result of preliminary tests made at the Pasteur Institute.

The theory that some diseases may be the result of a partnership of two kinds of germs was advanced by Dr. Aldo Castellani, internationally known for his studies of tropical diseases.

Protection against typhoid fever by swallowing vaccine was tried out experimentally in bacteriological laboratories at the State College of Washington.

Discovery of the chemical compound in tuberculin that causes the skin reaction in persons that have tuberculosis was announced by Dr. Florence B. Seibert, of the University of Chicago, as a new step toward understanding the chemistry of tuberculosis.

The belief that the adrenal glands play an important part in the production of body heat was advanced by Dr. Charles Sajous, professor of endocrinology at the University of Pennsylvania.

It was shown that ultra-violet light is necessary for the formation of vitamin B, which prevents beri-beri and similar diseases, and of the growth-promoting vitamin A, at least to a certain extent.

Nickel and cobalt were shown to be necessary to the proper functioning of the pancreas, which prevents diabetes, by Gabriel Bertrand, of the Pasteur Institute of Paris.

The Health Organization of the League of Nations built up an epidemiological service to check the spread of infectious diseases between countries.

A drive for full birth and death registration throughout the United States was inaugurated by the American Medical Association.

Tetraethyl lead "anti-knock" gasoline was declared not unduly dangerous to health by the U. S. Public Health Service.

A movement to secure uniform milk ordinances for all the states was instigated by the U. S. Public Health Service at a conference of health authorities from the different states.

Berlin established a matrimonial bureau where candidates for marriage can receive medical and genetical advice.

