

GENERAL SCIENCE

1952 Science Review

History may know 1952 as year of H-bomb. Year's medical advances include drug that could conquer malaria, new anti-TB drug, promising steps toward polio protection.

This summary of the year's happenings in the world of science is limited by space to just the highlights. Most of the events are described in detail in the pages of SCIENCE NEWS LETTER for the current year. If you wish to refer to any particular report, you may find it readily through the index. (See SNL, June 28, and also the issue which will appear next week, Dec. 27.)

By SCIENCE SERVICE STAFF

► THE TOPS in 1952 science, as well as tops in energy loosened by an act of man, was the hydrogen bomb, which presumably was achieved in secret Eniwetok tests.

We cannot be sure just what happened, but if scientists succeeded in transmuting or fusing tritium, the triple-weight isotope of hydrogen, into helium with mass lost converted into tremendous energy, the world has a new power source ranking with the fissioning of uranium and plutonium and the burning of fuels.

There is speculation, fed by the secrecy of the atomic energy program, that this hydrogen-helium conversion might even take place, slowly, without the trigger action of the immense sun-like heat of the plutonium bomb that is believed used to set off a hydrogen bomb. This would be of immense importance. But those not in secret circles can only surmise.

Atomic energy progress announced included the operation of the world's largest accelerator of atomic particles, the cosmotron at Brookhaven National Laboratory, that will rival the cosmic rays with energies up to 3 billion electron volts. Even this is only the beginning, for accelerators that will double and perhaps triple that energy are actually building, and the scientific possibilities of a machine operating at 100 billion electron volts were demonstrated during the year.

Application of atomic power to military uses made gains during the year. The keel of the year's first atomic submarine was laid, engines for it are underway, as are atomic power plants for an aircraft carrier and even airplanes themselves.

In man's continuing fight against disease, the most exciting progress was the successful testing upon prisoner-volunteers of a new drug that in very small doses both cures and prevents malaria. For the first time there is the hope of eradicating this mosquito-carried disease that is rated the world's No. 1 ill, killing 3,000,000 annually and afflicting a quarter of the earth's population.

To join with streptomycin in fighting tuberculosis by chemical methods, a new drug, called isoniazid, came into use, with encouraging results to supplement the older

method of fighting the great white plague.

In a year that saw infantile paralysis cases rise to an unusually high level, there was a mass test of the effectiveness of injections of the gamma globulin fraction of human blood in protecting children against polio. It seems to have worked, cutting the expected paralytic polio cases in half. This method will undoubtedly be used on a larger scale in 1953.

Two promising approaches to a vaccine were made. Virus was grown in eggs which may lead to a useful vaccine. Another vaccine method may give protection against all three types of polio, which were shown to be all the types that cause epidemics.

Promising progress was made in perfecting and using on human patients machines that can take over during operations the functions of the heart and other organs, while some attempts were made to transplant kidneys and lungs.

In electronics and communication, more use was made of transistors, the semi-con-

ductor devices that can do some of the things that vacuum tubes usually do.

The automatic factory and the mechanized business office are being foreshadowed by some of the developments in electronic automatic control mechanism.

There has been the hope that electronic computers could be applied to weather forecasting, which now is a matter of human experience and judgment. The mechanical "brains" progressed during the year so far that there is hope that large masses of numerical weather information can be fed into them to secure weather forecasts in the future sufficiently fast to be useful.

Jet airliners of British manufacture began commercial service between London and South Africa, marking an aviation epoch. Hidden largely under cloak of secrecy, more progress was made on jets for military use. We learned that a U. S. experimental plane in 1951 flew almost twice the speed of sound, and wind tunnel research is being conducted in the region of as high as seven times the speed of sound.

Much such advanced aviation research is aimed at bigger and faster guided missiles, pilotless craft that could reach any part of the world from any part of the world, carrying atomic warheads. We may be sure that already long-range missiles, which may outmode both pursuit plane and bomber, are flying. Some of them will soon be in production.

One of the consequences of radiocarbon dating, itself a by-product of the atomic



HISTORIC ZERO-GRAVITY FLIGHT—One of the monkeys which was rocketed nearly 40 miles into space. Results showed that man may be able to stand the gravity-free state for brief periods.

age, is the discovery that petroleum is being formed contemporaneously in the oceans from the debris of marine life. This explodes the theory that oil formation took millions of years of geologic time. Oil was recovered from the slime of off-shore seas and its high radiocarbon content showed it to have been formed recently.

Archaeologists reported that they had found that Jericho has been inhabited continuously for 6,000 years, which makes it the oldest city now existing.

In the heavens, something new was discovered about the great galaxy of stars, the Milky Way, in which we exist. It has spiral arms, detected both through light reaching optical telescopes and radio waves reaching radio telescopes.

The collision of two great aggregations of stars far distant from us in the universe was detected and located by very short radio waves received by radio telescopes. These nebulae are similar to our own Milky Way but so far away that it takes light millions of years to reach us. The newer method of observing both light and radio radiations produced convincing evidence that a gigantic meeting of nebulae has been spotted for the first time.

Science News Letter, December 20, 1952

AERONAUTICS

First Civilian Jetliner Starts Passenger Service

The world's first civilian jet airliner went into service, carrying 36 passengers between England and South Africa.

The greatest speed ever flown by man, 1,300 miles per hour in a Navy NACA experimental plane, was announced as accomplished in 1951.

The first helicopter crossing of the Atlantic, using the Labrador, Greenland, Iceland, Scotland route was successfully completed.

A high-speed, delta-wing interceptor aircraft went into production.

Television was used to improve radar reception for air traffic control at a busy airport.

Turboprop engines became standard equipment in an AF medium cargo transport.

Fast 100-passenger airliners with turboprop propulsion for long-range routes went into construction.

A new type of power plant, a turbo-compound standard piston engine with special exhaust turbines, was ready for use in a transport plane reported to have a maximum speed near 400 miles per hour.

Major progress was made in setting up very-high-frequency omnirange stations, blanketing the nation to guide pilots on cross-country flights.

Gas turbine and jet engines were used in seaplanes and flying boats, giving them the speed of land planes.

Britain's steam catapult for launching jet aircraft from Navy carriers was experimentally adopted by the U. S. Navy.

A revolutionary method of catapulting and belly-landing aircraft on land by catching it in a flexible sheet was developed.

A Northrop F-89D with rocket cannons in the wingtips instead of near the fuselage was announced.

A turbojet engine was developed that has, with its afterburner, a thrust giving approximately 25,000 horsepower.

A triple-deck freight airplane with room for eight automobiles, 42 passengers and crew was under construction.

A new means for bailing out of jet planes traveling at great speeds was developed; the whole cockpit is ejected by a rocket charge and parachuted to earth.

An American airbase at Thule, Greenland, 900 miles from the North Pole was opened, facilitating Great Circle flights over the top of the world.

Civilian polar air route from California to Denmark via new North Greenland defense airport at Thule was opened by an American-built Scandinavian airliner.

Airways criss-crossing the nation were given route numbers like highways.

An altimeter for use in the thin upper atmosphere was developed, using Geiger tube measurement of cosmic ray intensity as indicator of height above the earth.

A speed record of 699.9 miles an hour was made by a North American Saber jet plane at low altitude.

The "baby blabbermouth" radio signal used a recorded voice to identify stations on the VHF omniranges for aircraft.

ANTHROPOLOGY-ARCHAEOLOGY

Radiocarbon Dates Give Time of Migration Waves

Radiocarbon dates were interpreted to indicate that America was originally peopled by a long series of waves of migration, beginning more than 17,000 years ago and greatly stepped up 3,500 to 4,000 years ago.

Radiocarbon dating indicated that the ancient Dorset people, "ghosts of the Arctic," really lived in New York some 5,400 years ago while the north was still literally frozen.

Fluorine and other chemical tests of some North American human and extinct animal bones indicated that man was contemporary with some of the late Pleistocene animals.

Clovis fluted stone points, weapons used by early American man, were found for the first time in direct association with remains of a mammoth in Arizona.

Close to where 11,000-year-old Tepexpan Man was found in Mexico, discovery was made of man-made obsidian weapons and the bones of long-extinct elephants.

Superior flood control and irrigation devices were found in Arabia where they were in use a thousand years before the birth of Christ.

A new geochemical method for dating ancient human sites was developed, based on the fact

that where man makes his home he enriches the soil with chemicals, especially phosphorus and nitrogen.

Maize pollen grains, at least 2,500 years old, were found 240 feet below the surface of the lake bed on which Mexico City was built.

The shifting of archaic Mexican culture to the highlands and the return of the Nahua to the Basin of Mexico about 800-900 A.D. have been connected with climatic changes and resultant changes in lake level.

Excavations at the Biblical town of Jericho showed that people built houses and a city wall before they had learned to make pots, and that Jericho had a continuous history of at least 6,000 years.

Excavations at Nippur in modern Iraq, holy city of the Sumerians, yielded a large body of material representing the world's oldest literature and important sculptures.

Large jars in which Jewish people of the first century A.D. preserved ancient Biblical manuscripts were reassembled from fragments found in caves near the Dead Sea.

Digging was resumed at the important archaeological ruins of Pompeii where important Roman paintings have been unearthed.

Evidence of two-story construction in King Nestor's palace in ancient Greece and books on clay tablets, preserved some 3,000 years by the fire that hardened them while it destroyed the palace, were finds reported near Pylos.

A fifteenth century archer's helmet was plowed up in New Mexico and was believed to be part of the "surplus" with which the Spanish founder of the town equipped his expedition.

Human bones from the Mariana Islands showed the presence of yaws, a syphilis-like disease, in the South Pacific 1,000 years ago.

The same general pattern of social change is going on in widely separated parts of the world, it was found.

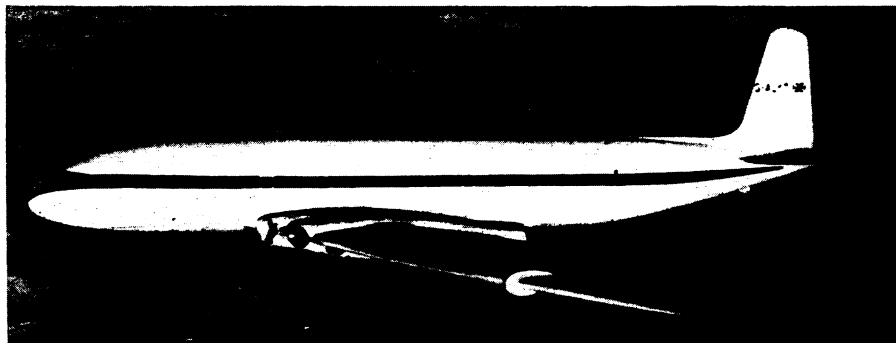
An anthropological laboratory was established in the highlands of Peru to test the effect of modern health, agriculture, education and industrialization measures on indigenous peoples.

ASTRONOMY

Trace Spiral Arms of Milky Way Galaxy

The spiral arms of our galaxy were tentatively located by tracing the shining nebulosity in Milky Way fields and measuring with radio telescopes the neutral hydrogen in the space between the stars.

Upward revision of the scale of brightness of Cepheid stars, used as a stellar yardstick, placed the Magellanic Clouds, Andromeda Nebula and



COMET JETLINER—Future versions of de Havilland Comet, put in regular service in 1952, will resemble the jetliner shown here. Powered by Rolls-Royce "Avon" engines, it will carry 44 passengers, with freight and mails.

nearly all external galaxies farther away than previously estimated.

Technetium, first chemical element to be discovered through atomic bombardment, was identified in the spectrum of red S-type stars.

Radio star in Cassiopeia was identified as the expanding envelope of what may have been a supernova of the remote past, and the source of radio signals from Cygnus was found to be a pair of galaxies apparently in collision.

A low-luminosity variable star in the southern constellation of the Phoenix was found to have the shortest known period of 80 minutes; a record star eclipse lasting 17 years was reported for a double star in constellation of Centaurus.

Twin coronagraphs for Fremont Pass, Colo., and Sacramento Peak, N. M., were completed; construction was begun on a new type of telescope to be used as a regular Newtonian reflector, as a Cassegrain reflector and as a Schmidt-type instrument; plans for the world's largest radio telescope, a 250-foot basket-shaped affair, were announced.

A method by which the heavier elements—carbon, oxygen, neon, silicon, etc.—can be built up in the hot stars out of helium atoms created from primordial hydrogen was suggested.

Spectroscopic observations substantiated the belief that helium is being burned by transmutation into carbon in the extremely hot cores of some of the older stars.

Midget star only about one-third as large as the earth, the smallest known star and one of the faintest, was discovered.

Carbon monoxide gas was found definitely to exist in the sun's atmosphere; hydrogen and helium were identified in the atmospheres of the distant planets Uranus and Neptune.

Novae seen to blaze forth include three in the constellation of Scorpius, two in Sagittarius, one each in Ophiuchus and Scutum; Eta Carina was found to be brightening again.

New comets discovered include Harrington-Wilson, Mrkos, Peltier, Harrington and a second Mrkos.

The sidereal year, the time it takes the earth to complete one trip around the sun, was recommended as a new standard of time to replace the mean solar day.

A corona of stars about four hundred million billion miles in radius was reported to completely surround our Milky Way galaxy of stars.

Northern lights were reproduced artificially through use of an atom-smasher.

Twin stars in the constellation of Cygnus were found to race around each other at the rate of over 1,500,000 miles an hour, the greatest value yet discovered.

In the Small and Large Clouds of Magellan, closest galaxies to our own, 42 eclipsing stars were spotted, the only ones except two recorded beyond our Milky Way system.

Many of the brightest stars in the heavens were estimated to have been created since life began here on earth.

Over a hundred blue stars, each at least 6,000 times as hot as our sun, were spotted in the Northern Cross region.

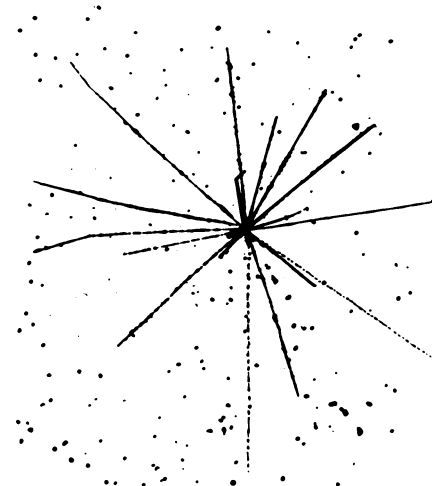
The hisses of a noisy radio star were noticeably reduced as the sun passed between the star and the earth.

BIOLOGICAL SCIENCES

Flesh of Superbison Preserved 28,000 Years

The flesh of a superbison, preserved in the permanently frozen ground of northern Alaska, was found by radiocarbon-dating to be over 28,000 years old.

Fossil remains of pliopithecus, the "missing link" between the modern gibbon and its evolu-



MAN-MADE ATOMIC "STAR"—
A photomicrograph of the first photographic film emulsion exposed to two-billion-volt nuclear particles in the cosmotron at Brookhaven National Laboratory, Upton, N. Y. The incoming particle, believed to have been a neutron and therefore invisible, hit the nucleus of an atom of the emulsion, exploding it into 17 different visible particles that formed tracks in a star-shaped pattern.

tionary ancestors, were discovered in a limestone deposit in Czechoslovakia; although gibbon-like, the fossil ape did not have the specialized long arms of the gibbon.

For the first time a virus-like crystalline substance was isolated from animal growth; it was obtained from human warts.

A lethal gene that affects the sex ratio, resulting in two females for every male born to a stock of mice, was discovered.

A species of giant toad, measuring at least eight inches in length and weighing about two pounds, was discovered in South America.

A technique was developed for transplanting fertilized egg-cells of mice into a foster mother mouse; thus mice can be produced that are not related genetically to the mother that gives birth to them.

Concerted efforts between Near-East nations and the United States brought about control of locust plague for the first time in history.

Use of santobrite, a poison, may make possible almost complete eradication of the snails that carry oriental blood flukes, cause of schistosomiasis in man.

Widespread outbreaks of the epidemic hog disease, vesicular exanthema, occurred.

A fatal virus disease of sheep, scrapie, appeared in the U. S. for the first time in California flocks.

Foot and mouth disease broke out in the cattle country of Saskatchewan, Canada.

The insect-killing power of DDT sprayed on walls was prolonged by a preliminary spraying with a phosphate solution.

Sheep may bear two litters a year through treatment with a newly developed sex hormone, ECP, it was predicted.

Experimental breedings between Red Sindhi bulls of India's tropics and temperate climate Jersey, Brown Swiss and Holstein cows yielded crossbreeds with large milk production in tropical and semi-tropical lands.

A feed supplement containing aureomycin and vitamin B-12 increased the laying of low-producing hens as much as 57%.

Work proceeded on an attempt to make photosynthesis occur outside living cells; if successful, this would make possible food production without living plants.

Yellow-dwarf, virus disease of oats, wheat and barley and spread by aphids, hit California in epidemic proportions.

Stems of bean seedlings were found to absorb streptomycin and cause it to move up into the leaves in sufficient amounts to suppress development of halo blight disease.

A marine biologist discovered three tropical woods that appear to be immune to attack by ship worms.

Plants were made poisonous to the insects that bite them by using insecticides the plants can take up into their roots, leaves and stems.

Exposure to slow neutron radiation was found to alter the sex ratio of hemp plants.

CHEMISTRY-PHYSICS

Eniwetok Tests Add to Thernuclear Research

The Atomic Energy Commission announced tests at Eniwetok and said that "the test program included experiments contributing to thernuclear weapons research," which was interpreted to mean that a hydrogen (tritium) fusion type bomb had been achieved.

A pilot reactor that has its fissionable material in the form of a mudlike slurry started operation and reached criticality.

A scintillation probe was developed for prospecting bore holes for underground radioactive ore.

Effectiveness of lubricants was tested by making one gear radioactive and measuring the radioactivity of particles in the oil stream.

Tritium was found to be no more dangerous than other forms of radioactive material when used as a tracer in biological research.

In the cosmotron at Brookhaven National Laboratory protons were accelerated to 2.3 billion electron volts, the highest energy to which fundamental particles have been accelerated; energies up to 3 billion electron volts are expected to be achieved.

Construction was started on a land-based prototype of the submarine intermediate reactor which, with its liquid metal coolant, will be housed in a spherical steel building.

The keel plate was laid for the first atomic submarine.

The first non-governmental research reactor was placed under construction at the North Carolina State College campus.

A low power research reactor shielded by a "swimming pool" of water, intended for experiments on improved radiation shields, was announced.

With a football-sized core, the National Reactor Testing Station in Idaho, using fast neutrons, was started on a program to demonstrate the possibility of breeding, or producing more nuclear fuel than is consumed.

The Materials Testing Reactor, capable of producing the highest neutron flux achieved so far in this country, went into operation at the National Reactor Testing Station in Idaho.

Electric light bulbs were lighted by the first useful electric power from atomic energy at the experimental breeder reactor of the National Reactor Testing Station.

A public demonstration was staged of an atomic bomb explosion, the third witnessed by the press.

The British exploded their first atomic bomb in Australia.

An atomic accelerator was under construction in Australia, and the Japanese advanced plans to replace a cyclotron destroyed by American occupation troops.

Paper was made of glass fibers to filter out radioactive dust.

Ion exchange plastics in membrane form were developed to desalt sea water continuously and perform other extractions of chemical substances from liquids.

Elusive V-particles, produced when a cosmic ray proton or neutron strikes the nucleus of an atom, were routinely photographed daily on top of Mt. Wilson, Calif.

A new subatomic zeta neutral particle, which lives for less than ten quadrillionths of a second and decays into two pi mesons of opposite sign, was discovered on photographic plates exposed at altitudes over 12 miles.

The theory that "empty" space is filled with an all-pervading ether was revived by Dirac as being in harmony with new electrodynamics ideas.

The theory that creation of matter in the universe is a continuous process was advanced.

The energy expended by an average thunderstorm was computed and found to equal that of 50 Hiroshima-type atomic bombs.

Radioactive tritiated stilbene was used as a constant light source to standardize phototubes.

The transistor, tiny germanium crystal device, was adapted to function at very high frequencies and so can be used in television or FM apparatus.

Six new compounds were found to serve as superconductors at extremely low temperatures.

Impure silicon shows an electronic specific heat at very low temperatures which can be removed by neutron bombardment, but which reappears upon subsequent heating.

Water can be purified by high frequency, high intensity sound and by radiation from atomic furnace wastes, it was announced.

The complete synthesis of morphine was accomplished, but it is not a commercial process.

Total synthesis of cortisone was achieved in a single, uninterrupted series of 30 steps.

Microbiological synthesis of cortisone from progesterone and other available steroids was achieved.

The chemical structure of the antibiotic, terramycin, was found to consist of carbon, hydrogen, nitrogen and oxygen atoms with four rings of six carbon atoms each fused into a bar pattern.

The structural formula for aureomycin was worked out, showing the drug to be amphoteric and high in oxygen content.

For the first time nucleic acid was isolated in its whole, pure state.

First direct evidence that proteins are built in a succession of steps from simple to more complex compounds was found.

An organic arsenic substance, called A-42, was synthesized and found to be extremely effective against insects while being relatively harmless to human beings and animals.

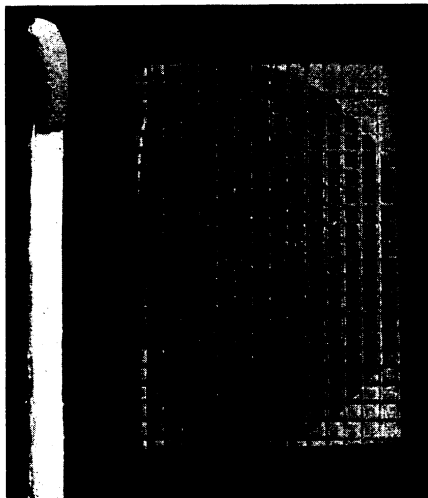
The origin of petroleum was illuminated through discovery by radiocarbon dating that hydrocarbons are accumulating in tidelands at the present time as debris from marine life.

Giant single nucleic acid molecules, such as present in chromosomes and genes, were seen for the first time, with the aid of the electron microscope.

Development of new types of fertilizer containing phosphoric acid promised to relieve the shortage of sulfuric acid and at the same time to aid in by-product uranium recovery.

Radiochemical methods were developed for the detection of trace quantities of minerals through use of neutron irradiation.

A method for detecting underground deposits of uranium and vanadium was developed through study of the kinds of plants growing



WAFER FOR TRANSISTOR—A match indicates the actual size of this germanium wafer used in producing transistors, tiny devices that can do the work of vacuum tubes.

on the surface and chemical analysis of their leaves.

Synthetic rubber was made more resistant to exposure to ozone by blending with a polythene.

Polyacrylonitriles were produced which change the structure of clay, making it porous and suitable for growing plants.

The Nobel prize for physics was awarded to Drs. Felix Bloch, Stanford University, and Edward M. Purcell, Harvard University, for independent work on use of amplified radio frequencies to study the structure of the atomic nucleus.

The Nobel prize for chemistry was awarded to the British biochemists, Dr. Richard L. Millington Syngé and Dr. Archer J. Porter Martin for developing the process of chromatography.

EARTH SCIENCES

Predict Weather by Electronic Calculator

A method of predicting the weather 24 hours ahead by use of an electronic calculator which works on a step-by-step, hour-by-hour basis was announced.

Winds of more than 1,100 miles an hour in the extremely thin air 65 to 100 miles up in the sky were measured by radar-like instruments; average wind velocity at that height was found to be between 150 and 200 miles an hour.

Scientists suggested that steady monsoons, striking constantly against the Himalaya mountains and air masses over Asia, are the cause of seasonal changes in the position of the North Pole.

The Air Force established a permanent weather station on an "ice island" close to the North Pole.

Tracking of jet streams, 200- to 300-mile-an-hour air currents about 30,000 feet above the earth, was begun, using jet planes.

Accurate forecasts of flood crest five to 15 days before occurrence, and general warnings issued more than a month before were responsible for an estimated \$100,000,000 saving along the 1,600-mile length of the Missouri River from North Dakota to Missouri.

Thirty-five major sea mountains, from 3,500 to 12,400 feet high, were found to rise from the floor of the Gulf of Alaska.

Oilmen pushed the method of increasing oil production by pumping water into seemingly exhausted wells; water injection into a central well drives oil to the pumping wells, adding greatly to the efficiency of oil extraction.

Study of Alaskan weather records for a 50-year period seems to indicate that Alaska has slowly warmed up; once ice-bound ports are now open for short periods in the summer.

Primary uranium ores were located in New Jersey, the first indication that primary uranium might be found in the Appalachians.

Extensive deposits of monazite, a thorium-bearing mineral, were discovered throughout a 700-mile area in the southeastern states.

Prediction was made that the Williston Basin of the Dakotas and Montana may be one of the major oil fields of America.

A deposit of an extremely rare mineral, nasonite, was discovered in California; the only other known place that nasonite occurs is in New Jersey.

Paracutin, the volcano that dramatically and unexpectedly burst forth from a Mexican cornfield, was declared dead this summer after nine years of intense activity.

Crater Elegante, huge hole in the earth's surface in Mexico, was caused when a volcano collapsed some 25,000 years ago, it was reported.

Ash Heap Crater, long believed extinct, erupted; this is its first known volcanic eruption in historic time.

Scientists determined that a particular parcel of air will scatter and diffuse into an area 1,000,000 times its original size in as short a time as two hours.

Fossil pollen studies of lake sediments in Mexico and New Mexico provided a continuous record of climatic changes extending back into the glacial period.

Earthquakes of the year included serious shocks in California, Japan, Argentina and Kamchatka.

ENGINEERING-TECHNOLOGY

Atomic Cannon Is Put in Production

A 280 mm cannon with double recoil mechanism that can fire either conventional or atomic projectiles was put in production.

A four-mile-long bridge over the Chesapeake Bay, longest continuous steel structure over water in the world, was opened to traffic.

"Scatter sounding," a technique for informing a radio operator of how well his signals are received in remote places, was developed.

An electronic digital computer was put into mass production.

The life of jet engines was greatly increased by coating with chromium glass the heat-resistant molybdenum metal used in them.

An electromagnetic pump, ancient instrument, was revived for use in the AEC breeder reactor for pumping "hot" metals.

A new medium tank, with one-piece cast hull that affords a poor target for enemy shells, was announced.

A mixture of blackstrap molasses and bunker fuel or asphalt was used to make beach sands hard enough for heavy military equipment.

A device for preventing an explosion when a bullet strikes an aircraft fuel tank was developed; it releases carbon tetrachloride to stop fuel gases from building up explosive pressures.

Logarithm tables accurate to 23 places and useful for numbers up to 99 sextillion were published.

Synthetic motor oils that lubricate truck and



AID BIOCHEMICAL STUDIES—Monkeys have always been one of the most valuable laboratory animals because their biochemistry most resembles that of humans. Here, Donald Tappan (left) checks the result of a nutritional experiment with Dr. C. A. Elvehjem at the University of Wisconsin.

automobile engines satisfactorily even under Arctic conditions were announced.

Work was advanced on methods for recording television programs on magnetic tape.

A way of preventing air pollution caused by ferromanganese blast furnaces by washing down the dust particles in the furnace gases was developed.

A "Walkie-Lookie," portable television camera for spot news coverage having a built-in power supply, was developed.

The transistor went into use in customer long distance dialing service.

An adjustable diesel locomotive was developed that can run on tracks ranging from the United States standard up to the widest gages in use.

Electronic scales buried under highways were used to weigh moving vehicles.

The British navy developed two new television cameras for underwater work, to be used in salvage and hull-inspecting operations in situations where divers can not be used.

MEDICAL SCIENCES

Polio Vaccine Gets First Successful Trials

A vaccine against all three types of polio virus got its first trials on children with gratifying results in increasing protective antibodies in the blood.

Success in getting one polio virus strain to grow in developing chick embryos gave hope of another polio vaccine that could be given by mouth.

Gamma globulin from human blood can more than cut in half the likelihood of children getting paralytic polio, trials involving 55,000 children showed.

Discovery that the polio virus is in the blood for a few days before attacking brain and

nervous system increased hope for success with anti-polio vaccines and medicines.

A fairly simple and inexpensive test for polio infection and immunity was announced.

Evidence that only three different polio viruses exist was obtained.

Pyrimethamine, tradenamed Daraprim, was reported the most powerful anti-malaria drug yet known, acting as a suppressant cure, with the further advantages of being tasteless, odorless and cheap.

Primaquine proved effective in preventing relapses of malaria in returning Korean troops.

Isoniazid, synthetic chemical known by several trade and chemical names, was announced as effective in tuberculosis, although TB germs soon developed resistance to it, and as promising in preliminary trials in Hansen's disease, or leprosy.

Two chemicals, spermine and a protein of unknown identity, which together have a poisonous effect on tuberculosis germs, were found in blood serum and body tissues.

Discovery of an anti-TB germ substance in lymph nodes of tuberculous cattle was announced.

From behind the Iron Curtain (Poland) came news of three new anti-tuberculosis chemicals, hydroxamic acids named T 40, T 95 and T 139.

Successful birth control by pills made of the chemical, phosphorylated hesperidin, was achieved by 298 out of 300 couples.

The escape route of red blood cells from an Rh-positive baby to the blood stream of Rh-negative mothers during pregnancy was traced through fragile capillary junctions leaving red infarcts on the placenta.

The nerve-gas type insecticides such as Parathion, and probably the nerve gases too, can have their dangerous skin-penetrating power reduced through a new kind of emulsifier obtained when ethylene oxide is added to a phenol of high molecular weight.

An antidote to Parathion and some other nerve-gas types of insecticides, and maybe to the nerve gases themselves, was discovered in the scopolamine derivative, Buscopan.

The first successful antidote to beryllium poisoning was found in aurin tricarboxylic acid.

An artificial heart-lung machine was used successfully on a human patient.

A new filter device was developed by the Army Chemical Corps to detect and identify germs in the air in 15 hours instead of almost four days.

Ugly, painful keloids in wound and burn scars were successfully treated with the enzyme, hyaluronidase.

For the first time scientists succeeded in extracting from living tissue a water-soluble substance which can make fat.

Two hormones from the pituitary gland, oxytocin and vasopressin, were isolated in nearly pure form and, for the first time, separated from each other.

Synthetic production for the first time of a B vitamin, the phosphate form of pyridoxamine which may give scientists a chance to learn more about cancer and nutrition, was accomplished.

A new B vitamin, lyxoflavin, with growth stimulating effects for rats and relaxing effects in human high blood pressure patients was synthesized.

A new vitamin factor, called biocytin, has been made artificially.

Discovery that the conversion of carotene to vitamin A is impaired in experimental diabetes was announced and called the first step toward discovery of an agent to control premature aging of the arteries (arteriosclerosis) in diabetics.

A chemical test of saliva that tells whether a boy or a girl baby will be born was developed.

The first hereditary link with the boy-girl ratio in human births was found in blood observations.

Intravenous use of Fraction I (fibrinogen) from human blood to treat uterine bleeding during pregnancy was successful in seven cases.

Living animals have, for the first time, been studied in a weightless, or gravity-free, condition.

Discovery of the first antibiotic chemical capable of stopping trypanosomes, a protozoan family whose members cause deadly African sleeping sickness among other diseases, was announced.

A new chemical, dimethylamino-isopropylphenothiazine, that promises to allow human whole blood to be preserved for longer periods than now possible was reported.

Experiments gave hope that human blood red cells can be stored at very low temperatures for long periods of time and still be useful for transfusions.

Successful gland transplantation in humans, giving hope of sex rejuvenation, was achieved by use of fetal instead of adult tissues.

A new anti-rheumatism chemical, phenylbutazone, or Butazolidin, was announced.

The B vitamin known as pantothenic acid was reported needed by the body to manufacture cortisone.

Cancer cell spread, called metastasis, was produced experimentally in mice for the first time.

First steps toward a skin test for detecting cancer through changes in electrical resistance were taken.

A definite trend toward more leukemia, and slightly more mutational abnormalities in children of those residents of Hiroshima and Nagasaki who got large doses of irradiation from the atomic bombs has been found.

The one-celled parasites called amebas, which cause amebic dysentery, were grown in pure culture for the first time in medical history.

Phantom limb sensations are being used to work an electrical arm under development in Germany.

Encouraging results in preliminary trials of a new antibiotic medicine for germ diseases, erythromycin or ilotycin, from the organism *Streptomyces erythreus*, was reported.

Mass testing to detect drunken drivers was promised by a 25-minute, two-step test.

A new test to tell whether a person died of drowning or was dead before his body was thrown or fell into the water was announced.

Significant chemical and clotting differences in blood and in kidney secretions of multiple sclerosis patients from normal patients were discovered.

A plastic artificial kidney performed outstandingly in trial on several patients suffering from acute kidney failure.

Starting Aug. 13, all bread in interstate commerce in the U. S. was standardized legally for the first time in the nation's history.

Resistance to a virus is inherited as a dominant in accordance with the Mendelian laws of inheritance, it was reported.

The 1952 Nobel prize in medicine and physiology was awarded to Dr. Selman A. Waksman of Rutgers University, discoverer of streptomycin and other antibiotics.

PSYCHIATRY-PSYCHOLOGY

Chemical Injection Brings Patients From Trance

Injection of a body chemical, cholinesterase, into the brain brought patients out of the catatonic trance of schizophrenia, a discovery promising new knowledge of what goes wrong chemically in mental illness.

Photoshock, treatment with an intermittently flashing light in combination with a sensitizing drug, and electrostimulation, treatment with a non-convulsive dosage of electric current, were tried out with some success on the mentally ill.

Removal of the adrenal glands was found, in a few cases, to give temporary improvement to mental patients.

Anguish felt by mental patients was attributed to a substance in the blood which sensitizes some of the brain tissue of susceptible persons.

Metrazol given by mouth caused improvement in mentally ill old persons with arteriosclerosis.

Mental illness, and especially schizophrenia, is more prevalent as the social level goes down, a survey showed.

A systematic study of children's responses to the Rorschach test demonstrated distinctive developmental patterns for all ages from two through ten years.

A kind of homesickness in reverse, termed "nostopathy," was found to affect persons returning home after military service or other prolonged absence.

Quarrelsome tendencies can be influenced more by inheritance than by learning, experiments with mice indicated.

Chronic fear, or anxiety, was found to have an effect on the stomach just opposite to that of acute fear—secretion of hydrochloric acid in the gastric juice is increased.

The chemical steps that make vision possible—bleaching of light-sensitive pigments in the retina and restoration of the pigment—were duplicated in the laboratory.

That previous experience in seeing is important to perception was shown by an experiment in which ring doves hooded from birth required more time to learn to distinguish geometric forms than normally raised birds.

Mesopic vision tests made in a cloudy moonlight illumination were found to correlate so closely with night vision tests that they can be

PUBLIC HEALTH

Nerve Gas As Food Poison

Contamination of food with nerve gases could kill hundreds of people before discovery. Simple chemical kit for detecting chemical warfare agents being developed.

► EXTREMELY DEADLY nerve gases may be used to poison wartime food supplies, Dr. Thomas H. Alphin, chemical warfare consultant of the Federal Civil Defense Administration, warned the National Food and Nutrition Institute meeting in Washington.

A few drops of the liquid form of nerve gases on the skin, if sufficiently concentrated, can cause death in a few seconds.

The highly toxic nerve gases are almost odorless, colorless and tasteless, and cannot be detected by the ordinary human senses until their deadly effects are felt. Contamination of food with nerve gases could kill hundreds of people before it is discovered, and make great quantities of provisions unusable.

Nerve gases can be spread by mortar shells, artillery shells, rockets or aerial bombs. Besides direct attack, nerve gas bombs could be planted by saboteurs for contaminating stores of food and other goods, as well as for anti-personnel purposes.

The Federal Civil Defense Administration is developing a simple testing kit for use in detecting nerve gases and other chemical warfare agents, Dr. Alphin said.

Atomic and biological warfare may also be waged against food supply, the National Food and Nutrition Institute was told.

Dr. Vincent B. Lamoureaux, radiological defense consultant of the Civil Defense Administration, said atomic warfare will cause greatest damage to food supply in the initial blast and fire of the explosion. The tendency in American cities to concentrate warehouses and processing plants in the same area increases the danger here, he said.

substituted for them in testing service personnel.

When gradually increasing electric currents were passed through the amalgam filling in teeth, a new sensation was experienced before the threshold of pain was reached.

Study of a wide variety of animals showed that all are sensitive to sweets.

What you experience with the sense of touch was found to interfere with your judgment of what you perceive visually.

The waking mechanism of the brain was located in the central core of the brain stem at the top of the spinal column.

A white rat is much more intelligent than has been thought and can be used instead of men in tests of the hazards of future flying, a new method of testing showed.

Tiny, one-celled paramecia can be trained, it was discovered, and their capacity for learning is related to heredity.

Radioactive contamination, however, is the new, unfamiliar result of atomic attack, he said, and may make otherwise unharmed foods completely unusable and possibly dangerous.

Biological attack, using insect pests and plant and animal diseases, may be used against our total food supply, said F. K. Erickson, acting chief of the emergency sanitation branch of the Civil Defense Administration.

But bacteriological contamination of prepared foods as a weapon of war may be an even greater danger, he said. It is not unlikely, for instance, that saboteurs could place infectious disease germs in the food supply of large numbers of people, resulting in their sickness or death and the spread of disease.

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AERONAUTICS

Cheaper Troop Transport By Air Than by Water

► IT IS cheaper to transport troops from England to overseas bases by British merchant airliners than by troopships on the ocean, according to a statement in London accredited to the British Secretary of State for Air. It would cost about \$11 less to fly a serviceman from England to the Middle East than to take him by boat.

As new jet and turboprop airliners come along, costs will be reduced substantially, it is claimed. The chief of air staff is reported to have said recently that two long-range, four-engined jet transports, with two in reserve, could lift in a year, between the United Kingdom and the Middle East, more troops cheaper than two of the latest troopships.

For troop transportation a fleet of Britannias, powered by turboprops, is proposed. On a non-stop flight between Britain and the Middle East, each of them could carry 130 to 140 fully equipped men at a cost of about \$42 per man per journey. The flight would take about seven hours. This cost is considerably below those on conventional aircraft and far less than surface costs.

The advantages of air trooping do not stop with the lower cost, it is stated. The speed of air transport also brings with it far greater mobility, because troops are not tied up in transit and can go rapidly to where needed. As mobility improves, a greater area can be covered with the same number of troops, or fewer troops can cover a particular geographic area.

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