SCIENCE NEWS

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SCIENCE IN 1942

CHEMISTRY AND PHYSICS

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ELECTRON accelerator, whirling electrons up to 20,000,000 volts and producing x-rays of like power was completed, and a similar 100,000,000-volt machine is being built. A direct current x-ray generator operating at a potential more than 4,000,000 volts was developed.

An x-ray microscope has been devised which, by a photographic process, converts the usual diffraction pattern of a crystal into an actual picture of the arrangements of the atoms in one plane of the crystal.

New electron spectrometer, utilizing the varied slowing up of electrons passing through a specimen, produces a "spectrum" which aids in identifying the material, and supplements the electron microscope examination.

New ultra-fast oscillograph, with a beam sweeping at 18,000 miles per second, and timing to a few billionths of a second, records the wave form of transients, lightning flashes, and other oscillatory discharges up to 113 megacycles.

New scanning electron microscope makes use of television principles to examine opaque objects (not possible in the ordinary electron microscope), and reproduces the picture on a telegraphic facsimile printer.

An adapter has been devised which converts the ordinary electron microscope into a diffraction camera, so that in addition to the usual electron picture, the crystal or molecular structure of the specimen may also be determined.

Desk-size electron microscopes were developed, having simplified operation and much lower cost.

Chemical element 61, illinium, which does not occur in nature, was produced artificially by atomic bombardment with the cyclotron, but quickly disappeared by radioactive disintegration.

New measurements of the "proper" life of the mesotron gave it 2.8 millionths of a second in place of 1.6 millionths of a second previously estimated.

The proposal has been made to use the freezing point of benzoic acid, 122.37 degrees centigrade, for the standardization of thermometers.

Neutron pictures to supplement x-ray pictures showed certain advantages; neutrons were also employed in geophysical prospecting.

Synthetic cellulose was made for the first time.

Hydrogen fluoride was found to be a catalyst superior to aluminum chloride in the manufacture of synthetic rubber and of 100-octane gasoline.

Methods were found for making many kinds of oil out of any vegetable or animal fat.

By the use of fusel oil, alcohol was made from agricultural and industrial wastes without the expensive distillation process.

New solvents of the nitroparaffin class were developed for paints, lacquers and varnishes.

A solution of potassium, copper and arsenic salts has been found an effective means of retarding decay in telephone poles.

Color photography at night from high flying airplanes has been made possible by special filters and brilliant flash bombs of colored light.

Synthetic chewing gum was produced to replace chicle from tropical America.

Bread molds were found superior to malt in alcoholic fermentation.

ASTRONOMY

The first planet outside our own solar system was discovered, a satellite of an obscure double star in Cygnus, that is a sixtieth the mass of the sun and about 16 times the mass of Jupiter.

The brightest nova since 1918, Nova Puppis, rose to brilliance greater than first magnitude.

A remnant of Kepler's famous nova of 1604 was discovered as a small fan-shaped cloud.

A "Saturn" star, an intensely hot body surrounded by a luminous gas ring four times the diameter of our sun, was discovered.

S Doradus, a star 600,000 times brighter than our sun, was shown to be a double star, with each twin a giant.

Three or four mysterious spectral lines in starlight were explained by assuming that a substance impossible on earth, CH, or hydrogen carbide, exists in the so-called "empty" space between stars.

The mass of the moon was determined anew, this latest value making it 1/81.271 of the earth's mass.

A new "window" in the atmosphere was discovered when the observable spectrum in the infra-red region was extended to 24 mu.

The most powerful magnetic field measured in a group of sun-spots was recorded for the group visible to the unaided eye February 25 to March 1.

The reddest star ever photographed was discovered in the constellation of Monoceros.

A nova or exploding star was discovered in the constellation of Cygnus.

New comets discovered were Whipple, Oterma I, Oterma II.

New comets rediscovered were: Grigg-Skjellerup, Forbes, Schwassmann-Wachmann I, Wolf I.

A military version of the Schmidt camera-telescope went into war service as an aerial camera.

Pronunciations of constellations, stars, planets, etc., were standardized.

War time was adopted February 9 when all civil clocks were advanced an hour.

EARTH SCIENCES

In order to deprive the enemy of weather information, daily maps and forecasts were suspended by the U. S. Weather Bureau for the duration.

There were 40 earthquakes of sufficient strength to record themselves on distant seismograph instruments;

notable among them was a "family" of nine shocks in Ecuador at the beginning of July.

A gas well yielding pure nitrogen surprised its drillers in Wyoming.

A new device for sorting valuable particles out of low-grade tin ores and other minerals was developed.

Large-scale tests of sponge-iron production were undertaken in order to relieve scrap shortage in steel production.

A robot weather station, suitable for installing on mountaintops or uninhabited islands, was invented.

An unprecedentedly wet season kept some central areas of the country soggy during much of the summer, and caused some floods.

There were several severe tornadoes; one of them, in the Ozarks, killed 28, injured 200.

A storm-caused tidal wave near Calcutta drowned more than 10,000 persons.

No tropical storms of full hurricane strength reached the United States from the Carribean-Gulf region.

A new branch of geological science made its bow: paleogrostology, the study of fossil grasses.

An outflow of lava from Mauna Loa menaced the city of Hilo, but stopped before doing damage.

Biological Science

Crops of corn, wheat, soybeans and several other products broke all records, despite menacing farm labor shortages and early frosts.

An American scientific mission went to China to aid in improving agriculture and soil conservation there.

There was lively interchange of scientific personnel and information between U. S. A. and Latin-American agriculture.

The U. S. A. and Britain offered aid to the USSR in reconstructing agriculture in the "scorched earth" regions after the war.

Search for new sources of natural rubber included enormous expansion of guayule acreage, importation of hundreds of pounds of kok-sagyz seed from the USSR, efforts to organize collections of wild rubber in South and Central America, and planting selected seedling and grafted trees in the same tropical regions.

The four great regional laboratories of the U. S. Department of Agriculture concentrated efforts on war problems.

Day-and-night changes in temperature were found necessary for the production of fruit and seed by plants.

Tobacco mosaic virus kept 28 years in a bottle was found still able to produce disease.

The country-wide Victory Gardens movement was successfully carried through.

Domestic production was undertaken in many crops hitherto imported: hemp and other fibers, cork oak, drug plants, flavoring herbs, etc.

The number of plant patents passed 500.

Mechanization of beet sugar production was advanced by invention of a machine for planting treated seed, and of another to top harvested beets; both previously hand work.

Many new insecticides, both natural and synthetic, were tried, in search for substitutes for previously imported pyrethrum and rotenone.

A substitute for tapioca, both for food and "stickum" for stamps, was found in "Leoti" sorghum seed.

Thousands of sea birds became U-boat victims, killed by oil released from torpedoed ships.

Archeology, Anthropology

New Stone Age implements were found in the famous cave on Mt. Carmel in Palestine where only Old Stone Age records had previously been known, thus closing a long gap in the site's pre-history.

Cannibals and head-hunters in some South Sea islands reverted to old practices, due to removal of governmental controls and missionary influences by Jap invasion.

Despite a wartime spurt in the birth rate, the population of the United States is becoming stationary, statistical studies indicated.

No human artifacts were uncovered along the whole length of the new Alaskan Highway.

The smallest known normal human skull was found in an ancient cemetery in coastal Peru.

Psychology and Psychiatry

The number of brain cells in baby rats was increased artificially by injecting the mothers with pituitary growth hormones before the birth of the young, but their ability to learn was not increased.

A test for color aptitude has been prepared for evaluating workers in industries requiring accurate discrimination of small color difference.

Experiments showed that a change in the pitch of sound may be heard although there has been no shift in the point of maximal stimulation on the basilar membrane of the cochlea.

By stimulation of the eye with a barely perceptible electric current, it is possible to distinguish between blindness due to disease of the eye's retina and blindness caused by disease of the nerve.

Brain wave rhythms which are blocked out when the eyes see light can be used to detect cases of faked complete blindness.

By leaving intact a tiny isolated blob of pituitary gland and hypothalamus to maintain the water and sugar balance of the body, it was possible to discover that animals lacking 95 per cent. of the brain can walk, jump, claw and right themselves.

A single application of alum to the motor area of the brain made animals subject to repeated epileptic-like seizures when exposed to loud noise, apparently by permanent alteration of the brain cells.

Brain injuries resulting in spastic paralysis do not result in any characteristic personality traits, survey of 123 child patients revealed.

The character of brain activity, which changes with increasing age during the period of growth, was observed to continue to change toward the fast end of the brain frequency spectrum during adult life.

A monkey was taught to distinguish objects on the basis of such qualities as mobility and color, demonstrating a capability for this kind of abstract thinking.

(To be continued)