

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.

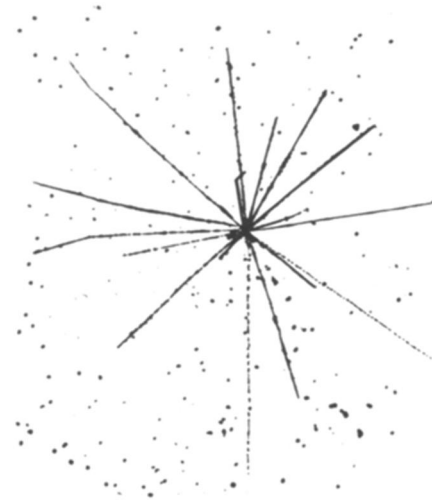
The hisses of a noisy radio star were noticeably reduced as the sun passed between the star and the earth.

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 Thermonuclear Research

The Atomic Energy Commission announced tests at Eniwetok and said that "the test program included experiments contributing to thermonuclear 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.