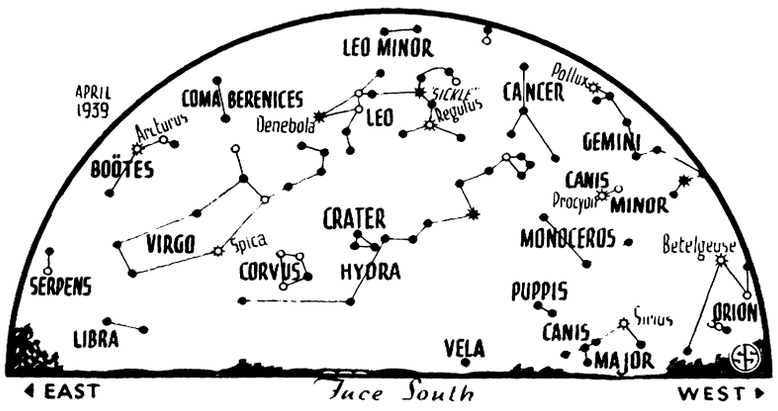


ni, the twins, with Castor and Pollux. To their left, and a little lower, just above Sirius, is Procyon, in Canis Minor, the lesser dog. About as high, in the northwest, is Capella, in Auriga, the charioteer. And low in the north, like a "W" resting on one side, is Cassiopeia, the queen.

No planets are placed this month in such a position as to be shown on the maps. In the last few days of April Mercury will be seen low in the east, in the morning twilight. Venus is still the conspicuous morning star, visible in the southeastern sky, even after dawn has started to break, but it is drawing closer to the sun. Jupiter is in the same direction, and will pass Venus on the evening of April 21, when the planets are not visible in the United States. But if you look at them the next morning, you will still see them close together, with Venus the more brilliant of the pair. Saturn this month is nearly in line with the sun and will not be seen at all.

Only Mars is left, but that is seen as a brilliant red planet, in the constellation of Aquarius, in the east after midnight. We now have a foretaste of the summer, when it will be closer, and brighter, than for many years past.

Celestial Time Table for April

Saturday, April 1, 8:00 a. m., moon nearest earth, 226,500 miles away. **Monday, April 3,** 11:18 p. m., full moon. **Monday, April 10,** 12:27 a. m., Algol at minimum; 4:33 p. m., moon passes Mars, about 11 lunar diameters to north. **Tuesday, April 11,** 11:11 a. m., moon at last quarter. **Wednesday, April 12,** 9:16 p. m., Algol at minimum. **Thursday, April 13,** 4:00 a. m., moon farthest away from earth, 251,400 miles away. **Saturday, April 15,** 6:05 p. m., Algol at minimum. **Sunday, April 16,** 11:04 p. m., moon passes Jupiter about 10 lunar diameters to north; 12:54 p. m., moon passes Venus, about 11 lunar diameters to north. **Wednesday, April 19,** morning, partial eclipse of sun, seen as annular in Alaska; 11:35 a. m., new moon. **Friday, April 21,** early a. m., meteors from constellation of Lyra; 9:00 p. m., Venus passes Jupiter about half a lunar diameter to south. **Wednesday, April 26,** 1:25 p. m., moon at first quarter. **Friday, April 28,** 5:00 a. m., moon nearest earth, 229,400 miles away.

Eastern Standard Time throughout.

Science News Letter, March 25, 1939

PHYSICS

Cosmic Ray Research Will Aid Study of Distant Nebulae

COSMIC RAYS, already a potent means of learning new things about the nuclei or "hearts" of atoms, will next have the task of helping scientists discover new facts about distant nebulae.

This new role of cosmic ray research in the future was suggested at the Sigma Xi lecture at Louisiana State University by Prof. Carl D. Anderson of California Institute of Technology.

Prof. Anderson, brilliant young winner of the Nobel Prize in Physics in 1936, when he was only 31 years old, is noted for his researches on cosmic rays and for his discovery of the positron, fundamental atomic particle.

"Cosmic ray researches have told us new facts about the smallest things in the universe, the elementary particles," Prof. Anderson said. "They give rich promise of telling us in the near future equally important facts about the largest things in the universe, about the far-away nebulae and other astronomical bodies.

"Cosmic ray investigations will support and be supported by astronomical investigations. The electroscope, Geiger counter and cloud chamber will work hand in hand with the 200-inch telescope, each doing an important job in translating into knowledge those messages which come to us from outer space."

The energies of some cosmic ray particles are enormous, Prof. Anderson continued. They are more than 1,000 times as energetic as any other particles known in the science of physics.

In studying cosmic rays in the laboratory scientists are in effect "sitting in" at the death and birth of matter, declared Prof. Anderson:

"A certain electron, for example, which may have been playing its prosaic role as a part of an atom for hundreds or thousands of years, will be struck a blow so hard that it will be projected through space at a speed greater than a hundred thousand miles a second; it will in turn strike several million other electrons and pass through several million atoms before it is finally brought to rest and again attaches itself to another atom, where it may carry out its normal duties with very little disturbance for perhaps another million years."

"Twins" Born

Other electrons, however, may be annihilated by the cosmic ray impact. After several million years' existence, perhaps, suddenly this electron disappears. But out of this annihilation a new electron appears which is one of a set of atomic "twins." These twins are alike except that they have opposite electrical charges.

Such positive and negative electrons, created in pairs, follow a greatly different "life" pattern. The negative electron joins other similar electrons and takes up a normal existence in some other atom.

The positive electron, however, survives only for about a billionth of a second. In this brief fraction of time the positive electron finds a negative electron and the two combine and neutralize their electrical charges. By this union, Prof. Anderson said, they are annihilated and in their stead appear "two bits of radiant energy whose ultimate fate will be to interact with other electrons in the surrounding material."

Prof. Anderson's lecture is the first of

14 which he will give in universities through the country in the next three weeks. The lectureship is sponsored by Sigma Xi, national honorary society for the promotion of research in science. Election to membership in Sigma Xi is equivalent—among scientists—to membership in Phi Beta Kappa in general academic life.

Science News Letter, March 25, 1939

PHYSICS

Fast Electrons Added To List of Atomic "Bullets"

FOR the first time anywhere scientists at the University of Notre Dame have demonstrated that an electron—lightest of all atomic particles—can produce an atomic disintegration.

Prof. George B. Collins, Dr. Bernard Waldman and William R. Polye of the Physics department have shot swift flying electrons from the Notre Dame atom smasher into atoms of the chemical element beryllium. (*Physical Review,* Feb. 15). Out of the impact each beryllium atom, of mass nine, was turned into two atoms of helium, each with mass four, and into a neutron of mass one. The energies of the electrons used as "bullets" in the research were 1,720,000 electron volts.

The experiments are highly important to science because they indicate another way in which neutrons can be created by atomic bombardment. Neutrons are the massive, neutral particles used so widely in the current splitting of uranium with the release of vast amounts of atomic energy.

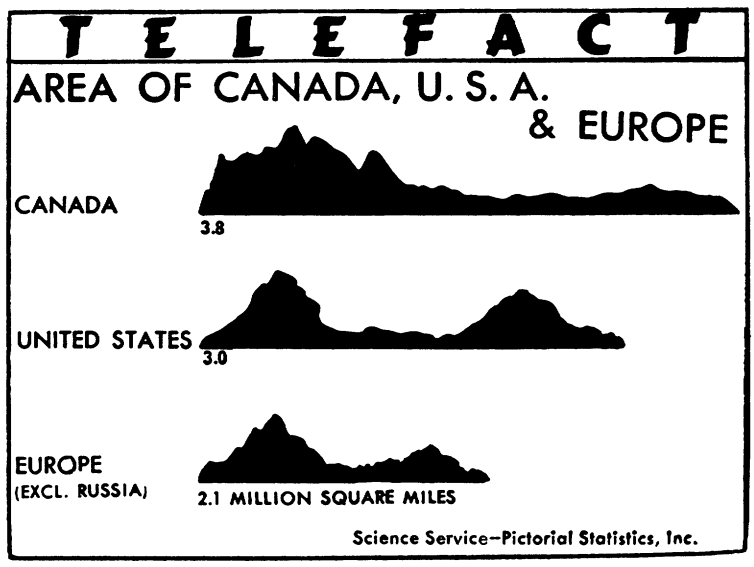
Previously scientists have been unable to effect transmutation of the elements and atomic disintegration with electrons. Cores of hydrogen atoms, known as protons; deuterons; and neutral particles, the neutrons, have been employed.

Prof. Eugene Guth, of Notre Dame, made the mathematical calculations forecasting that high energy electrons might disintegrate beryllium in a way which these experiments have now confirmed.

The actual train of events in the bombardment, reports Prof. Guth, is that beryllium of mass nine, when struck by the electron, forms beryllium of mass eight, plus a neutron, plus a low energy electron. The beryllium, mass eight, almost instantly breaks down into two helium atoms, each with atomic mass four.

Science News Letter, March 25, 1939

Jamestown Island, famed in Virginia history, is really about a dozen islands cut apart by creeks.



MEDICINE

Blue Dye May Have Role In Sulfanilamide Treatment

When Patients Turn Blue, Injection of Methylene Blue Restores the Oxygen-Carrying Hemoglobin of Blood

WHEN patients getting sulfanilamide treatment turn blue, as a number of them alarmingly do, it may be helpful to inject into their veins a blue dye, methylene blue. Dr. William B. Wendel, of the University of Tennessee College of Medicine, makes this suggestion on the basis of investigations he has made there and at Washington University School of Medicine, St. Louis.

Dr. Wendel has just reported details of his investigations to the scientific publication, the *Journal of Clinical Investigation.* Associated with him in part of the investigations were Dr. Alexis F. Hartman of Washington University and Dr. Anna Dulaney of the University of Tennessee.

Methylene blue is the same dye that was widely heralded a few years ago as a life-saving antidote in cases of carbon monoxide and cyanide poisoning. According to Dr. Wendel's studies, the dye may find a new field of usefulness by making sulfanilamide treatment less hazardous for some patients, especially those having heart and respiratory involvement, and by making it possible to give larger doses of sulfanilamide, thus extending its usefulness in combating infections.

Dr. Wendel believes that the reason some patients turn blue when under sulfanilamide treatment is because some of the oxygen-carrying hemoglobin of their blood is converted into methemoglobin, which cannot carry oxygen. As a result the tissues of the body are at least partially suffocated. If this condition went far enough it would end fatally.

When methylene blue is injected into the veins, the methemoglobin disappears rapidly from the blood and is replaced by an equivalent amount of hemoglobin, Dr. Wendel reports.

Medical scientists are not all agreed that development of methemoglobin is the cause of the blueness (cyanosis is the technical term) of some patients during sulfanilamide treatment. Dr. Wendel points out that the frequency of methemoglobin development following sulfanilamide treatment has not been determined, but he and his associates found at least traces of this chemical in the blood of approximately 98 out of 100 patients who were getting sulfanilamide. He therefore believes the use of methylene blue as an aid to sulfanilamide treatment is worth trying, although he cautions that small amounts of the dye should be used and that it should be injected slowly and carefully into the veins.

Science News Letter, March 25, 1939