ASTRONOMY

Earth's Growth Stunted

Theory of arrested growth in youthful period of four planets closest to the sun is advanced by Purdue physicist. They include Mercury, Venus, Earth and Mars.

➤ THE four planets closest to the sun—Mercury, Venus, our own earth and Mars—never quite grew up. Their growth was stunted when they were young. They took on weight, but failed to balloon in size like Jupiter and the other planets farther away from the sun.

This picture of the creation of the solar system is advanced by Dr. D. ter Haar of Purdue University's Department of Physics.

The solar system did probably start from a sun surrounded by a gaseous envelope just as the German philosopher, I. Kant, thought, Dr. ter Haar reasons. Likewise the six planets that have satellites began as bodies with extended atmospheres.

Atmospheres Around Planets

When they were being created, the outer planets were surrounded by atmospheres, but the inner planets had practically none. As a result, today the outer planets such as Saturn and Jupiter are surrounded by extensive satellite systems while the inner planets possess only a few of the known satellites.

The original solar envelope contained between one-tenth and five-tenths of the solar mass, the Purdue physicist calculates.

Three distinct steps followed in the creation of the planets by condensation are reported to be:

1. The formation of nuclei for further condensation.
2. The growth of these nuclei.
3. The capture of additional light compounds by gravitation. The planets are pictured as growing much faster during the last stage when they captured numerous gas molecules than during the first two.

The first two stages, Dr. ter Haar figures, are similar to the formation of drops of moisture in a supersaturated vapor. The temperature determines which compounds are supersaturated at a given density.

In the gaseous disk from which the planets were created, the temperature decreased with increasing distance from the center. Consequently, in the regions nearer to the sun fewer compounds took part in the initial condensation phases than in the outer regions of the solar system.

"It now turns out," Dr. ter Haar states in the journal, *Science,* (April 23) "that in the regions of the solar system where the terrestrial planets are found, only inorganic compounds will condense. In the regions of the outer planets, however, both organic and inorganic compounds can condense. It is very remarkable that the change-over from inorganic to organic compounds lies just in the region between the inner and outer planets."

Two results follow, Dr. Ter Haar calculates. First, there will be fewer condensation nuclei in the inner parts of the system than in the outer parts. Secondly, the specific density of the condensation nuclei in the inner regions will be higher than that of the nuclei in the outer regions. From this alone, we could expect heavy, small inner planets and light, large outer ones.

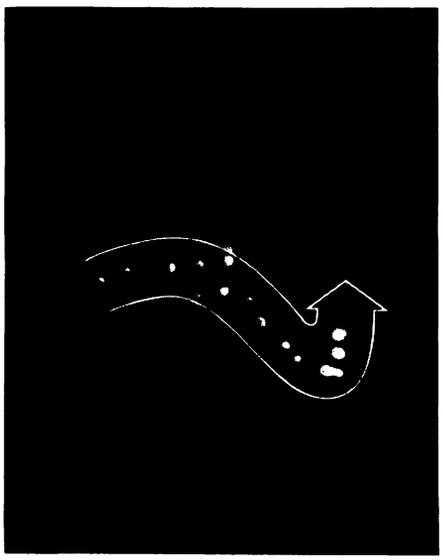
The inner planets grew more slowly than the outer planets during the first two stages. Therefore the outer planets may well have reached the third stage before the envelope surrounding the sun had dissipated very much. But by the time the inner planets had reached the size that gravitational effects would be important, the gaseous envelope had practically dissipated and appreciable further growth was impossible.

Third Stage of Growth

In the building up of the outer planets, about 20 times as much matter in the sun's gaseous disk took part as was used in the formation of the inner planets. By failing to grow up fast enough, these were cheated out of the third stage of their growth, that of acquiring lighter gases by gravitational capture.

A qualitative analysis such as this, Dr. ter Haar reports, shows that the theory advanced by Kant in the middle of the eighteenth century is stronger than was suspected. It is thus rather satisfying to find, he says, that the differences between the inner and outer planets can be explained by the Nebular Hypothesis, the simplest possible explanation of how the solar system came into being.

Science News Letter, May 8, 1948



ELUSIVE ELECTRON—The first definite tracks of electrons, particles that make up atoms, are shown in this picture, developed after an electron sped through the emulsion, striking silver grains in its path. This shows an enlargement of a 13-grain track. X-rays, filtered through lead, were used to start the electrons flying into this new type of Eastman plate.

PHOTOGRAPHY

Electron Tracks Captured On New Photographic Plate

➤ ELECTRONS, known as particles of electricity, are the commonest of the fundamental bits of matter, and scientists work with them daily.

Yet only now have electron tracks been definitely photographed. Eastman Kodak scientists announced that tracks about two thousandths of an inch long—less than the thickness of this piece of paper—have been captured in a special photographic emulsion.

Science News Letter, May 8, 1948

GENERAL SCIENCE

Three Medals Awarded at National Academy Meeting

➤ THREE medals were awarded in absentia to scientists at the annual meeting of the National Academy of Sciences.

Dr. Alexander G. Vologdin, a corresponding member of the Academy of Sciences of the U.S.S.R. and a distinguished scientist of the Paleontological Institute in Moscow, received the Charles Doolittle Walcott bronze medal and award for 1947 for his researches on the

early Cambrian organisms, *Archaeocyatha.*

Dr. Felix Andries Vening Meinesz, professor of geodesy and geophysics in the University of Utrecht and President of the Netherlands Geodetic Commission, was awarded the Agassiz gold medal and honorarium for 1947 for his contributions to oceanography. Prior to the invention of his multiple pendulum apparatus, measurements of gravity could not be accurately determined on unstable ground.

The Henry Draper medal for 1947 was conferred on Dr. Hans Albrecht Bethe, professor of physics at Cornell University, for his quantitative solution for the source of the tremendous flow of energy from the sun and stars.

Science News Letter, May 8, 1948

GENERAL SCIENCE

New Science Accolades

Elections to National Academy of Sciences and American Philosophical Society include three Nobelists and plutonium discoverer. Fourth woman academician named.

➤ WHEN she was elected to the most exclusive science society in America, the National Academy of Sciences, Dr. Gerty T. Cori, of Washington University Medical School, St. Louis, added this honor of being the fourth woman academician in history to a similar election a few days earlier to the American Philosophical Society, with almost as restricted a membership.

She thus joins her husband fellow-scientist in membership in these two leading societies as well as the Nobel prize given them last fall.

The discoverer of plutonium, Dr. Glenn T. Seaborg, University of California chemist, was another scientist elected to the Academy.

Prince Louis de Broglie, Nobelist and famous French theoretical physicist, and Dr. Ronald A. Fisher of Cambridge, England, leading statistician, were elected foreign associates of the Academy.

The discoverer of the neutron (the atomic particle that is trigger of the atomic bomb) Sir James Chadwick of Liverpool, England, was elected a foreign member of the American Philosophical Society, as was Dr. Otto Lous Mohr, president of the University of Olso.

The physicist-member of the Atomic Energy Commission, Dr. Robert F. Bacher, was elected a member, as was Frederick Osborn, U. S. representative on the UN Atomic Energy Commission, who was made a member in the social science section.

Other new members elected to the National Academy of Sciences are:

Eric G. Ball, professor of biological chemistry, Harvard Medical School; Lloyd V. Berkner, chairman of the Section of Exploratory Geophysics of the Atmosphere, Carnegie Institution of Washington; Felix Bloch, professor of physics, Stanford University; Hallowell Davis, director of research, Central Institute for the Deaf, research professor of otolaryngology, Washington University; John R. Dunning, professor of physics, Columbia University; W. Maurice Ewing, head of department of geophysics, Columbia University; Karl Folkers, assistant director of research, Merck and Co.; Thomas Francis, Jr., professor of epidemiology and chairman of the department, School of Public Health, University of Michigan; Edwin R. Gilliland, professor of chemical engineering, Massachusetts Institute of Technology; Haldan K. Hartline, associate professor of biophysics, Hospital of the University of Pennsylvania; Ernest R. Hilgard, chairman of the department of psychology, Stanford University; Frank L. Horsfall, Jr., member, Rockefeller Institute for Medical Research; John R. Johnson, professor of chemistry, Cornell University; Raymond A. Kelser, dean, School of Veterinary Medicine, and professor of bacteriology, University of Pennsylvania; Cyril N. H. Long, chairman of department of physiological chemistry, Yale University School of Medicine; Edward J. McShane, professor of mathematics, University of Virginia; Donald H. Menzel, chairman of department of astronomy, Harvard University, associate director for solar research, Harvard College Observatory; C. W. Metz, chairman of department of zoology, University of Pennsylvania; Curt P. Richter, associate professor of psychobiology, Johns Hopkins University; Hermann I. Schlesinger, professor of chemistry, University of Chicago; Francis O. Schmitt, head of department of biology and biological engineering, Massachusetts Institute of Technology; Gilbert M. Smith, professor of botany, Stanford University; Curt Stern, professor of zoology, University of California; Chester Stock, professor of paleontology, California Institute of Technology; James B. Sumner, professor of biochemistry, Cornell University; Edward Teller, professor of physics, University of Chicago; Kenneth V. Thimann, associate professor of botany, Harvard University; Charles A. Thomas, executive vice president, Monsanto Chemical Company.

ACADEMY MEETING—Among the scientists attending the annual meeting of the National Academy of Sciences were (left to right): Dr. Th. G. Sahama, visiting Finnish scientist at the Geophysical Laboratory, Carnegie Institution of Washington; Dr. Felix Chayes, Geophysical Laboratory, Carnegie Institution of Washington; Dr. K. J. Neuvonen, visiting Finnish scientist at the Geophysical Laboratory, Carnegie Institution of Washington; and Dr. W. H. Bucher, professor of structural geology, Columbia University.