

Map Moon's Terrain

THE FIRST topographic map of the moon is now being prepared in this country. It will be used in the selection of eventual landing sites on the moon, as well as in the designing of a lunar surface vessel and telemetering instruments.

The project is being carried out jointly by the U. S. Army Map Service and the U. S. Geological Survey. It was outlined before the Geological Society of America meeting in Pittsburgh by Arnold C. Mason, Maxim M. Elias, Robert J. Jackman and Anabel B. Olson of the Geological Survey, Washington, D. C.

Observatories from various parts of the world have cooperated in the project by providing photographs of the moon. These are being carefully matched to obtain pictures of the same areas from different angles during the moon's libration, or slow, apparent swing of the visible half of the moon's surface.

This libration causes parts near the limb or edge to be alternately visible and invisible, assuring map coverage of about 60% of the lunar surface. It is doubtful whether recent Russian photographs of the other side of the moon will show sufficient

detail to be useful for topographic map-making purposes.

Although many planimetric maps (those that do not indicate elevations) of the moon have been prepared, this new map will be the first topographic map of the moon's surface, Mr. Mason told SCIENCE SERVICE.

The map, expected to be completed by October, 1960, will be at a scale of 1:5,000,000 on a modified stereographic projection. Elevations will be shown by form lines at 1,000-foot intervals. At this scale, the diameter of the moon would represent 50 inches on the map. The moon map will thus be printed on four separate 30-square-inch sheets.

A second map is also contemplated at a scale of 1:1,000,000. This will probably require an additional several years to complete.

The current terrain study of the Geological Survey describes surface features, including slopes, and will include interpretations of the constituents and texture of the moon's surface, and the likelihood of underground openings and caverns.

Science News Letter, November 14, 1959

ASTRONOMY

Find Nitrogen Tetroxide In Atmosphere of Venus

THE CHEMICAL compound nitrogen tetroxide has been discovered for the first time in the atmosphere of the planet Venus.

Its presence there was detected from an examination of the sun's light reflected from Venus and spread out into its rainbow pattern of colors by a spectrograph at Georgetown University, Washington, D. C. Nitrogen tetroxide consists of two atoms of nitrogen and four of oxygen.

The compound has also been found in Jupiter's atmosphere, and the scientists reporting their Venus studies suspect it is present in the atmosphere of Mars. Finding nitrogen tetroxide in a planet's atmosphere explains previous failures to detect molecular oxygen—the oxygen is locked away in chemical compounds.

No free oxygen has been found in the atmosphere of any planets of the solar system except earth, Dr. C. C. Kiess of Georgetown College Observatory reports. The studies of the spectrum of Venus were made by Dr. Kiess, his wife, Harriet C. Kiess, and Father F. J. Heyden, director of the Georgetown Observatory. Their observations are reported in *Science* (Oct. 30).

They found a wide, continuous absorption band in the violet and ultraviolet region of the Venusian spectrum between about 4,500 and 3,800 angstroms. This structureless band is virtually "identical" with that produced by nitrogen tetroxide gas.

The presence of nitrogen tetroxide on Venus may also account for the color effects, when that planet's atmosphere appears

not pearly white, but yellow, when seen through a telescope.

Their studies were made with the support of the U. S. Army Engineers at Fort Belvoir, Va.

Science News Letter, November 14, 1959

ASTRONOMY

Four "Exploding" Stars Found From Mt. Palomar

FOUR SUPERNOVAE, "new stars" that suddenly blaze forth to several million times their previous brightnesses, have been detected so far this year at Mt. Palomar Observatory.

Supernovae sometimes shine with considerable fractions of the total brightness of the galaxies in which they appear. They are believed to occur at the average rate of one in each galaxy every 300 or 400 years. The last to appear in the Milky Way galaxy in which the sun and its planets, including earth, are located was in 1604.

The four supernovae of 1959 were found by Howard S. Gates and Dr. M. L. Humason, members of a scientific team searching for exploding stars under a program sponsored by the National Science Foundation.

Detection of supernovae is important because of the possibility the blazing stars can be used as yardsticks to measure intergalactic distances.

When enough is known about supernovae, it may be possible for scientists to determine the distances of the galaxies in which they appear from the apparent brightnesses of these "new stars."

Science News Letter, November 14, 1959

NEW AND IMPORTANT BOOKS FROM PHILOSOPHICAL LIBRARY

ATOMIC TERMINOLOGY

English-German-French-Italian, edited by Lore Lettenmeyer. A dictionary of essential terms in atomic and nuclear physics and associated fields. \$6.00

UNIVERSITY MATHEMATICS

by Joseph Blakey. In one volume; all that is necessary for a rapid yet thorough study of algebra, trigonometry, co-ordinate geometry, calculus, etc. "The best book of its kind." *Leeds University Review* \$10.00

MODERN ELECTRONIC COMPONENTS

by G. W. A. Dummer. The first complete survey of the characteristics of the more common electronic components, and their behavior under normal and stress conditions. \$15.00

DICTIONARY OF AERONAUTICAL ENGINEERING

by J. L. Nayler. An up-to-date dictionary which includes details of the new terminology which has arisen with advent of guided missiles, satellites, etc. \$10.00

NUCLEAR POWER PLANT

by E. Oppenshaw Taylor. A review of the basic ideas underlying nuclear power generation. \$7.50

ELECTRIC MOTORS AND GENERATOR ILLUSTRATED

by E. T. G. Emery et al. The design, construction, installation, operation, testing and maintenance of all types of AC and DC motors and generators. Over 400 illustrations—diagrammatic and pictorial. \$12.00

AUTOMATION, CYBERNETICS AND SOCIETY

by F. H. George. An over-all survey of cybernetics and its applications as automation. Illustrated. \$12.00

ELECTRONIC COMPUTERS REVISED

by T. E. Ivall. Largely revised, with new, modern diagrams and pictures. The emphasis is on digital and analogue computers and their applications in industry, commerce and science. \$12.00

THE CHALLENGE OF SCIENCE EDUCATION

Edited by Joseph S. Roucek. Twenty-five international authorities discuss the level of science in American education, the relation of science to classical education, religion, and national welfare, and many other aspects of science in society. \$10.00

PROPERTIES OF MATTER

by F. C. Champion and N. Davy. An enlarged edition of a standard text; the subject re-oriented from a philosophical point of view to atomic interpretations. \$10.00

CHEMISTRY OF NUCLEAR POWER

by J. K. Dawson and G. Long. An authoritative account of the part played by chemists in the development program of nuclear power. \$10.00

THE STORY OF CHEMISTRY

by Georg Lockemann. A completely new comprehensive history which not only includes the newest advances in nuclear chemistry but sheds new light on theories of ancient chemistry. \$4.75

You can expedite shipment by enclosing remittance.

PHILOSOPHICAL LIBRARY

15 East 40th Street, New York 16, N. Y.