RICHARD D. UNDERWOOD
Biographical Review

Richard W. Underwood was born in Newport, Rhode Island. He received a B.S. Degree in Geology from the University of Connecticut. Additionally, he has studied at the Colorado School of Mines, the U. of Wyoming, George Washington University and the U. of Houston.

Mr. Underwood served in the U.S. Navy, Pacific Theater, during World War II and was commissioned in the U. S. Naval Reserve in 1950, retiring in 1972. Before coming to NASA Johnson Space Center in 1964, he was a civil servant employed with the Army Map Service as a photogrammetry engineer, starting out as a project engineer for the securing of mapping and intelligence aerial photographs in Europe, Asia, Africa, and Latin America. In 1958, he became Chief of Operations for Photogrammetry and in 1961 Chief of Photo Products Branch of Army Map Service. With the Johnson Space Center, Mr. Underwood served as a Supervisory Aerospace Technologist in such capacities as Technical Monitor for photographic experiments on Gemini and Apollo missions and in the development of the High Precision Photographic Laboratory facility at JSC, which processes films from the Apollo, Skylab, and Earth Resources Aircraft Programs.

He presently serves as Technical Assistant to the Chief, Photographic Technology Division, where he is a photogrammetric and photographic sciences consultant to NASA staff elements for such programs as Skylab, Apollo Soyuz Test Project, Space Shuttle, Earth Resources Aircraft Program and related activities.

Mr. Underwood has authored and presented many papers in the field of photogrammetry, photographic sciences, and aerospace photography in the U.S. and abroad.

He is a member of numerous professional photogrammetry and photographic societies, as well as the Geological Society of America.

See Abstract on next page

PHOTOGRAPHY FROM MANNED SPACECRAFT
by
Richard W. Underwood

ABSTRACT

A series of color photographs taken by astronauts from manned spacedraft clearly show the Earth's principal physiographic and structural features. A photographic trip around the Earth shows geological features at distances between 160 kilometers and 400,000 kilometers.

Examples of applications of photography in space include (1) Engineering photography taken in space as "steppingstones to the moon," (2) Apollo 11 photography to relive the historic hour at Tranquility Base on July 20-21, 1969, and (3) color photography from Apollo 12 through 17. Striking color photographs from the latter missions are important in examining the explorations and experiments made by astronauts on the moon. A sequence of views from the current Skylab flights show astronomic studies and geoscience applications.

Geoscientific applications of space photography are demonstrated in Cartography, Meteorology, Oceanography, Agricultural Sciences, Land Development, Civil Engineering, Air and Water Pollution, Structural Geology, and Mineral Exploration. The potential value of these applications to human welfare is very great.

* *