

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey
Geologic Division
Branch of Astrogeology
345 Middlefield Road
Menlo Park, California

April 30, 1963

Memorandum:

To: V. E. McKelvey

From: D. P. Elston



Subject: Monthly report for Director and Secretary

1. Highlights and noteworthy results.

D. J. Milton has identified stishovite in sandstone that had been explosively shock-loaded by P. S. De Carli of Stanford Research Institute. This is the first crystalline phase, other than diamond, to be synthesized by shock in the laboratory.

Revised estimates have been presented by R. E. Eggleton for the thickness of the Apenninian Series in the Lansberg region of the Moon, an area extending from 16°N to 16°S and from 10°W to 50°W lying adjacent to the southern edge of the Mare Imbrium basin and including the Ranger target area. The average of the estimated thickness of the Apenninian in the eastern three-fourths of the region is about 600 meters. The thickness generally decreases away from the Mare Imbrium basin. The eastern half of the area forms a strip nearly radial to the inner Imbrium basin, a large circular basin within the Mare Imbrium basin. In this strip the estimated thickness shows a general southward decrease from about 900 meters at the northern edge to about 550 meters in the southern two-thirds. This regional trend supports the interpretation that the Apenninian Series is ejecta from the inner Imbrium basin.

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5. Conferences and scientific meetings:

E. C. T. Chao attended the American Geophysical Union meeting in Washington,
D. C.

R. J. Hackman attended the 29th Annual Meeting of the American Society
of Photogrammetry in Washington, D. C.

R. J. Hackman attended a meeting of the Philadelphia Geological Society
in Philadelphia.

D. P. Elston attended the Pacific Northwest Metals and Minerals Conference,
Portland, Oregon.

H. J. Moore attended the 6th Hypervelocity Impact Symposium at Cleveland,
Ohio.

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6. Talks or papers presented at meetings.

<u>Speaker</u>	<u>Organization</u>	<u>Subject</u>
R. J. Hackman (Astrogeology)	29th Annual Meeting of the American Society of Photo- grammetry, Washington, D. C.	"A Lunar Isotonal Map"
R. J. Hackman	Naval Air Engineering Center Space Technology Series, Philadelphia, Pennsylvania.	Lunar Geologic Mapping
R. J. Hackman	Philadelphia Geological Society Philadelphia, Pennsylvania.	Lunar Geologic Mapping
D. P. Elston	Pacific Northwest Metals and Minerals Conference, Portland, Oregon.	"Astrogeological re- search of the U.S. Geological Survey"
E. C. T. Chao	California Institute of Tech- nology, Pasadena, California.	Impact metamorphism
E. C. T. Chao	Scripps Institute of Oceano- graphy, La Jolla, California.	Impact metamorphism
E. C. T. Chao	American Geophysical Union, Washington, D. C.	"Geological occurrences of some Southeast Asian and Australian tektites".

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<u>Speaker</u>	<u>Organization</u>	<u>Subject</u>
E. C. T. Chao	American Geophysical Union, Washington, D. C .	Metallic spheroids from Meteor Crater, Arizona (by Cynthia Mead, Janet Littler, and E. C. T. Chao).

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7. Visitors.

Visitors

Visited and purpose

Dr. James W. Johnson
Georgetown University

R. J. Hackman to see and discuss various stereoscopes that are available for photointerpretation purposes.

Lt. Col. Alberto Viola
Buenos Aires, Argentina

R. J. Hackman to discuss photogeologic techniques used in lunar mapping.

Carroll F. Merriam
Prospect Harbor, Maine

R. J. Hackman to discuss facilities available in Maine for the forth-coming lunar eclipse.

Peter Grant
Marquardt Corporation
Van Nuys, California

R. J. Hackman in regard to instruments and studies their company is undertaking that might be applicable to lunar work.

George P. Zebal
Vice President
Rocky Mountain Assoc.
Alexandria, Virginia

R. J. Hackman for information on Astrogeology's lunar studies.

Ralph B. Baldwin
Oliver Machinery Company
Grand Rapids, Michigan.

R. J. Hackman to discuss some geologic aspects of his new book on the Moon.

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7. Visitors

Visitors

Visited and purpose

L. R. Bartlett

Boeing Aircraft

Seattle, Washington

D. P. Elston, R. E. Eggleton, Harold Masursky to discuss nature of lunar surface and lunar vehicle design.

Sigurdur Thorarinsson

Icelandic Vulcanologist

C. H. Marshall and J. F. McCauley to discuss lunar vulcanism and visit Sunset Crater, Arizona.

C. H. Marshall and

J. F. McCauley

(Astrogeology)

Dr. Arthur Hoag, U.S. Naval Observatory, Flagstaff, to discuss dome and telescope construction.

Lado Muhlstein, NASA

Ames Research Center

R. V. Lugn, Ray Batson, H. J. Moore to discuss possibility of application of photogrammetric techniques to record experimental data.

Al Loomis, Jet Propulsion

Laboratory, Pasadena, Calif.

R. E. Eggleton to discuss status of Branch program and Jet Propulsion Laboratory geological planetology program.

Ed Lawrence, Consulting

Geologist, Reno, Nevada

Harold Masursky to discuss mineralization in the Cortez Range, Nevada.

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7. Visitors

Visitors

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Harold Masursky
(Astrogeology)

Harold Giltmaker, Don Groning, and
M/Sgt. Edward Heart, Photo Electronic
and Analysis Section, Reconnaissance
Laboratory, Wright-Patterson AFB, Ohio
to obtain ultra high altitude photography.

Dr. Henry Kirshner
Cornell Aeronautical
Laboratory, Inc.
Cornell University

E. C. T. Chao to discuss thermal expan-
sion data of stishovite.

Dr. Virgil Barnes
University of Texas

E. C. T. Chao to discuss tektites.

Dr. Alvin J. Cohen
University of Pittsburgh

E. C. T. Chao to discuss tektites and
matters concerning the 1963 International
Tektite Symposium.

Dr. Henry Schwarcz
Canada

E. C. T. Chao to discuss tektites and
the Ries Crater.

Dr. Peter Signer
University of Minnesota

E. C. T. Chao to discuss rare gases in
Ries rocks and tektites.

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7. Visitors

Visitors

Visited and purpose

Michael Duke

E. C. T. Chao to discuss meteorite studies, laboratory facilities.

California Institute

of Technology, Pasadena, Calif.

Donald E. Gault, NASA

E. C. T. Chao to discuss study of small particles.

Ames Research Center

James M. S. Sun

E. C. T. Chao to discuss tektite and high pressure minerals.

Jet Propulsion Laboratory

Pasadena, California.

C. H. Marshall and

Kitt Peak National Observatory to inspect the telescopes and observatories.

J. F. McCauley

(Astrogeology)

C. H. Marshall and

The Geology Department, The Arizona Geological Survey, and the Lunar and Planetary Laboratory, all at the University of Arizona.

J. F. McCauley