EVENING MEETING, HGS/GSH—MAR. 6, 1978

ELLIOT C. MORRIS—Biographical Sketch

Born in Ely, Nevada, Dr. Morris earned BS and MS degrees from the University of Utah. On Leaving the University, he worked 3 years in the Rockies and Alaska for Seismic Exploration, Inc., and Phillips Petroleum Company before resuming his studies at Stanford. While attending Stanford, he worked for the USGS in nearby Menlo Park and took time out for brief stints as instructor of the Stanford field course and as exploration geologist with Richfield in Alaska.

Since receiving his PhD in 1962, Dr. Morris has worked in the Astrogeologic Studies Branch of the U.S. Geological Survey at Flagstaff, Arizona. With the Survey, he has served as Co-Investigator on the Lunar Surveyor Project; Principal Investigator for the Earth-Moon Librations Regions Experiment of the Gemini XI and XII earth-orbital flights; Staff Scientist, Planetary Programs Office, NASA, and Project Chief, Remote Sensing of Geologic Units, McMurdo Area, Antarctica. Since 1969 he has been an experimenter on the Viking Lander Imaging team of the NASA Viking Mars Program, and since 1975 he also has served as Assistant Chief of the Branch of Astrogeologic Studies of the USGS. Dr. Morris is on tour as a Distinguished Lecturer for the AAPG.

VIKING VIEW OF MARS (Abstract)

Two Viking spacecraft, one launched in August and another in September of 1975, travelled more than 200 million mi to explore the planet Mars. The flight of these spacecraft, the intricate landing maneuvers, and the complex operation of the scientific experiments approached perfection.

Detailed pictures returned by the Viking orbiters and landers have revealed the surface of Mars to have much more variety than anticipated. The orbiters have taken thousands of extraordinarily sharp pictures, superior to any taken by previous missions. Hundreds of thousands of square kilometers of the surface photographed by Viking contain numerous physiographic features that are extremely perplexing and difficult to understand. Viking orbiter pictures reveal abundant evidence of catastrophic floods that occurred on the Martian surface in some distant past age; huge canyons, great volcanoes, and vast regions covered by blankets of wind-borne sediments are visible.

The cameras mounted on the two Viking landers have taken more than 1,200 detailed photographs which show the Martian surface at both landing sites to be a rocky, boulder-strewn, reddish-orange desert. Many of the rocks that litter the surface at both sites seem to be vesicular; they could have been produced either by volcanic processes or by hypervelocity impacts of meteorites.

Although both lander 1 and 2 sites appear to be similar block-strewn landscapes, in detail the small-scale features of these areas exhibit considerable variety. The lander 1 site, with bedrock exposed locally, has an undulating surface exhibiting a relief of several meters; the lander 2 site, with no bedrock exposures, is generally flat. At the lander 1 site there is a spectacular field of dunes or drifts of very fine-grained material, scalloped and eroded by Martian winds. Similar dunes are absent at the second site. The lander 1 cameras show the rocks in the vicinity of the spacecraft to have great diversity in brightness, shape, and texture, whereas the lander 2 cameras reveal rocks almost monotonous in their vesicular character.

The primary mission of the Viking spacecraft ended November 5, 1976, when Mars passed behind the sun and radio communication with the spacecraft ceased. Operations of the spacecraft were revived in late December 1976, when Mars again became visible. Acquisition of data from Viking will continue in an extended mission phase for the next 2 years.