

# The Royal Society

Monday 9 June 1975 at 10.00 a.m.

Tuesday 10 June 1975 at 9.30 a.m.

Wednesday 11 June 1975 at 9.30 a.m.

and

Thursday 12 June 1975 at 9.30 a.m.

at 6 Carlton House Terrace, London, SW1Y 5AG

A MEETING FOR DISCUSSION

THE MOON – A NEW APPRAISAL FROM SPACE  
MISSIONS AND LABORATORY ANALYSES

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## 67. STRATIGRAPHY OF THE MOON

By F. El-Baz

The lunar scene is a continuous panorama of ancient impact physiography. Multiringed circular basins and smaller craters scar the Moon's highlands and provide evidence of a violent early history. Basin formation, the major material-transporting mechanism on the Moon, produces a deep inner depression, one or more benches, a basin rim, and radially lineated ejecta. Study of lunar photographs indicates that, on a relative age scale, subdued basin and crater features are older representations of younger, well-preserved forms. Absolute age dating of returned samples makes it feasible to calibrate this relative age scale. All the larger basins were formed during pre-Nectarian, Nectarian and Imbrian times, i.e. 4.6 to 3.9 billion years ago.

Following this major sculpturing episode, and during the Imbrian and Eratosthenian times, mare volcanism became the most important mode of deposition of lunar surface materials. Basaltic lavas from deep-seated sources flowed to partially fill the impact basins and cover their peripheral troughs and surrounding lowlands between 3.8 and 3.2 billion years ago. This occurred more frequently on the nearside than on the farside, probably because the farside crust is thicker. Graben rilles, arches and ridges in and around mare basalts attest to post-mare crustal deformation to adjust to the added load of dense volcanic rock. During the past one billion years, Copernican time, only a small number of craters were formed in both highland and mare rocks.

The successes and failures of photogeology in studying lunar stratigraphy provide the necessary lessons for understanding the geologic history of the terrestrial planets. This is particularly true since both Mars and Mercury display many common types of features with the Moon.