

Mohr. (If these names sound like Gaelic or worse to the nonspecialist, it may be said in their defense that they represent things no more outlandish or less tangible than the elementary particles of physics. Whether or not they are more chaotic remains to be seen.) People looking for new ideas or new fields to conquer will find that almost none of the famous controversies on the origins of these rocks have been firmly resolved. There is still plenty to do, as this book helps to show. But a great deal has been done. Hadrian would have liked what underlies and makes up the wall he never saw.

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The Moon

Planetary Science. A Lunar Perspective. STUART ROSS TAYLOR. Lunar and Planetary Institute, Houston, 1982. xx, 482 pp., illus. \$39.95.

This is the third book concerning the moon written by Taylor. Each book has sought to provide a synthesis of knowledge at an appropriate point in time: following the historic Apollo 11 mission; following study of samples returned by the last Apollo flight; and, now, during a hiatus in planetary exploration. The author properly takes the view that our understanding of the moon is central to the interpretation of remotely sensed data obtained for other planets and satellites.

The book deals with the geology, geophysics, and geochemistry of the moon. The treatment is generally laudable although, by the author's own admission, it is biased toward geochemistry. The origin of the moon is concluded to be in accord with the double planet hypothesis; the capture hypothesis is dismissed, and the fission hypothesis is ruled out for a number of reasons. This discussion is perhaps the least balanced in the book. The evidence of a magma ocean essentially contemporaneous with accretion is very strong, and the author makes a case for melting of the whole moon. The primary differentiation of the moon into crust, mantle, and core (?) occurred during solidification of the magma ocean. The origin of enigmatic KREEP remains obscure but must also be related to the magma ocean. Petrogenesis of mare basalts is complex but is broadly consistent with the remelting of mafic magma ocean cumulates. All of these events have been

observed to a greater or lesser degree by intense cratering events. The moon has been geologically quiescent for three billion years.

The author points out that in some ways our understanding of the moon exceeds our understanding of earth because of the moon's small size and relatively simple geologic history. However, in practical terms our knowledge of the moon is pathetically inadequate. We lack even a low spatial resolution global geochemical and geophysical map of the moon. We lack photographic images of the lunar poles. We have not sampled the most typical lunar terrain. The possibility of a lunar base has been raised, yet we could not sensibly decide on a site for such a base given our current knowledge of the moon.

Overall, the book presents a scholarly synthesis of lunar science in late 1981. I know of no other book in which this task has been attempted. The book is eminently readable and is largely free of typographical errors. Earth and planetary scientists with even a casual interest in the moon will benefit from reading it.

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