

ciently certain for incorporation into a Moonwide stratigraphic system.

The absolute length of the periods can be estimated only crudely. An assumption that the majority of craters are of impact origin allows the spatial frequency of craters on surfaces of different ages to be compared with the flux in space of potential crater-forming objects and the spatial frequency of presumed impact structures on Earth. Such comparison suggests that, if the present rate of flux prevailed through the Copernican and Eratosthenes Periods, these periods occupied the greater part of time since the origin of the planets. If so, the pre-Imbrian and Imbrian must have been periods of short duration during which the rate of impact of crater-forming objects exceeded that in subsequent time.

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November 9, 1964

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"What Is Our Geologic Image?"

The image the geologist portrays to the public is generally indistinct. Few people have a clear understanding of the geological profession and its contributions to society. The capabilities, talents, and potential leadership of the geologist are generally overlooked. The image must be brightened by aggressive actions. The public should be informed and educated to the qualities of the geologic profession. Students need to be encouraged to study geology; to recognize that geology as a science is not only rewarding as an avocation but also as a vocation; that the economic geologist has almost unlimited opportunities to advance his ambitions.

During 1966, the Semi-Centennial Year for the American Association of Petroleum Geologists, petroleum geology will be publicized. Through its theme "Petroleum Geology—The First Fifty Years" the public will be informed on the contributions that petroleum geology has made to mankind. Both national and local publicity campaigns will take the geological message to the people in an effort to enhance and enlighten the geologic image.

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"Origin and Significance of Glauconite in the Geologic Sequence"

Glauconite is defined as any sand-sized, earthy, greenish pellet found in sedimentary rocks. This definition has no specific implication regarding chemical or mineralogical composition. However, most glauconite pellets are composed primarily of a randomly interlayered 10-Angstrom non-expandable (illitic) material and expandable (montmorillonitic) material. Much of the variation in glauconite properties is related to variation in the amount of expandable layers present.

Glauconite pellets reveal much variety in external appearance (morphology) and internal structure (as seen in thin section). These characteristics can be used to interpret the origin and/or subsequent history of pellet types. Suggested origins include (1) chemical precipitation, (2) expansion and alteration of detrital mica, (3) alteration of fecal pellets, (4) alteration of clay fillings of fossil tests, (5) mechanical aggregation, and (6) chemical replacement. Original morphologies may be obscured by abrasion (reworking) and internal structures changed by recrystallization.

Glauconitization apparently requires four essential factors: (1) parent material (generally an expandable layer lattice silicate), (2) a source of iron and potassium (sea water), (3) local reducing conditions, and (4) time. The last factor emphasizes the progressive nature of glauconitization, which may be terminated at any stage (most likely by burial).

The progress of glauconitization results in certain interrelated changes in glauconite pellets:

- (1) An increase in iron and potassium,
- (2) a decrease in the amount of expandable material, (3) an increase in crystallinity (degree of ordering), (4) a change from light green to dark green color, and (5) an increase in rounding and sorting of pellets. There are only general trends and exceptions may be common.

Glauconite is a reasonably safe criterion for a marine, shallow water environment and slow rates of deposition. It is most abundant at unconformities; e.g., at the base of marine transgressive sequences. Redeposition in terrestrial environments is unlikely. Transportation of glauconite after its formation inhibits its use as a more spe-