ure does not necessarily invalidate the methods.

In discussing the possibility of polyphylesis of the angiosperms, Hughes presents some arguments of a sort that tends to negate his previous demand for thorough analysis of the fossil record. Hughes's reasoning is that there are clear-cut differences between the monocotyledons and dicotyledons (in spite of comparative morphologic evidence from groups such as Piperales or Alismatales that fails to show such differences), that the monocotyledons may have begun with the Palmae (again, a view totally at variance with views based on extant plants), and that Palmae first appear much later than the earliest dicotyledons and hence may have a separate origin. He dismisses without reanalysis Doyle's (1973) well-documented report of the occurrence of monocotyledons other than palms in beds about as old as those having the earliest dicotyledons.

Hughes's more general point is, however, well taken. We should not be restricted in our thinking by concepts based totally on extant plants or continue to look among extant plants for "matches" with the fossils. Analyze the fossil record, which has the important element of time that is lacking in studies of extant plants. When approached in this manner, the origin and early diversification of angiosperms will no longer be viewed as an "abominable mystery." I strongly urge any student or colleague to read this book and to consider the ideas presented.

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Operation Kohoutek

Comet Kohoutek. Papers from a workshop, Huntsville, Ala., June 1974. GILMER ALLEN GARY, Ed. National Aeronautics and Space Administration, Washington, D.C., 1975 (available from the Superintendent of Documents, Washington, D.C.). x, 272 pp., illus. Paper, $3.35. NASA SP-355. Stock No. 033-000-00598.

Although Comet Kohoutek fell short of the brightness optimistically predicted for it in early 1974, the intensive campaign coordinated by NASA's "Operation Kohoutek" office made it by far the best-observed comet in history. Very important to a number of novel discoveries was the interest stimulated by the campaign among investigators who had not previously been actively engaged in studies of comets.

Early, sometimes incomplete, results obtained from observations of Comet Kohoutek, many of them with NASA facilities or in NASA-coordinated observations from Skylab 4, aircraft, rockets, and ground-based telescopes, were presented at a workshop held at the Marshall Space Flight Center in June 1974. This volume, the skillfully edited proceedings of that workshop, provides a very useful overview of the wide variety of investigations that were carried out, together with their principal results. Particularly impressive is the enormous wavelength range included in the diverse observations of the comet, extending from the extreme ultraviolet to radio detection of the hydroxyl radical at 18 centimeters. Detailed reports of most of this work have been published since the time of the workshop, many of them in the special issue of *Icarus* (**23**, No. 4 [1974]) devoted to results of observations of Comet Kohoutek. References to such publications are given, and only short summaries of the authors' work are presented in this volume.

The final section of the book includes very interesting summaries by A. H. Delsemme, Fred L. Whipple, George Herbig, and John C. Brandt. These serve to bring into focus the significance of the new findings and to point out areas in which information is still lacking. Several appendices, including a comprehensive ephemeris of Comet Kohoutek, complete the book.

Intensive programs of observation of selected comets, parallel to Operation Kohoutek, can be expected further to increase our fund of information on the structure and composition of the comet nucleus and on the formation and behavior of the coma and tail in the near-sun environment. But very important gaps clearly will remain until it is possible to investigate comets in situ.

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