Hull gives an unusually coherent account of the succession and filiation of ideas, at the expense of particulars on experimental science. One of his greatest concerns is "the contrast between empirical and a priori methods," and in comparing the Alexandrian and Athenian periods, he gives credit to both, declaring, "The triumph of empiricism was necessary for science. But speculation was an essential first step . . ." (page 124). His comparison of these two periods is especially interesting. He points out with unusual clarity their philosophic differences and attributes them to the influence of the sophists and the neglect of Plato at Alexandria.

Particulars get even shorter shrift in his treatment of the last two centuries; important experimental scientists (Black, Liebig, and Michaelson) and even whole sciences (acoustics) get lost. The 18th century is not lost, as it appears to be, for it is considered in the chapter entitled "Other developments in the 16th and 17th centuries"! But, notwithstanding the brevity, the main lines of recent scientific thought are well discussed, and perhaps better elucidated because of the omissions, for significant particulars are brought in cogently to illustrate the argument.

Hull has begun his work with a disclaimer of any intention of dealing with technology. The scientist will therefore be surprised to find himself referred to on the first and last pages (but apparently nowhere in between!) as a "technician." This slip, if such it be, may be connected with the author's concern "that men of science shall have more in common with other men of thought. Perhaps then they will have less to do with men of power" (page 325). Hull believes history to be useful to the accomplishment of this laudable aim, but not just any history. "Let everyone know the history of his own subject" (page 325). A scientist could do much worse than to begin with Hull's book.

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Fundamentals of Advanced Missiles. Richard B. Dow. Wiley, New York; Chapman and Hall, London, 1958. xvi + 567 pp. Illus. $11.75.

In the preface to this book Dow describes his objective as ". . . a comprehensive treatment of the subject that will present fundamentals in broad perspective but without emphasis on any one type of system." In view of the enormous breadth of the field covered and despite the obvious difficulty of avoiding any reference to information covered by military security restrictions, he has substantially achieved his objective by compressing a fairly comprehensive treatment into one volume of only 555 pages. If there is to be any criticism of this work, it must be on the matter of thoroughness rather than comprehensiveness.

Following a brief historical introduction, the book begins in earnest with a mathematical treatment of flight kinematics, based primarily on geometric considerations. The second chapter, entitled "Application of fluid mechanics to aerodynamics and propulsion," continues the development of kinematics into the area of fluid flow and thermodynamics. It continues with an easily understandable treatment of shock waves and then goes on to discuss rocket and ram-jet engines, ending with an extremely abbreviated section on propellants and combustion.

The author seems almost to have gone out of his way to avoid introducing Newton's laws of motion until the last possible point in the book. The laws appear at the beginning of chapter 3, under the general heading "Dynamics." The remainder of this chapter develops the aerodynamics of bodies, wings, and composite configurations and discusses such subjects as maneuverability, aerodynamic heating, range computations, dynamic stability, and automatic flight control systems.

Although a skilled statistician or operations analyst would undoubtedly consider the chapter on "Application of probability and statistics" to be rather elementary, I thought it to be one of the more valuable sections of the book. The subject is one about which many engineers working in the field of missiles and space vehicles seem to be poorly informed. Although still in the nature of an introduction, this part of the book covers many important elements of subject matter, using well-selected illustrations from fields of guided-missile engineering such as lethality, accuracy, reliability, and signal-to-noise ratio.

Succeeding chapters on microwaves, infrared radiation, and radar will be interesting primarily to those who have had little previous opportunity to study such phenomena and their applications to guided missiles. Chapter 8, on guidance, tends to be more descriptive than the previous chapters and therefore appears to suffer even more from the restrictions imposed by security considerations.

The final chapter considers complete guided-missile systems and outlines the engineering of such systems. This chapter should be valuable for the same reason that chapter 4 is valuable—namely, that not enough engineers and managers in the guided-missile business understand what is involved in true system-design work.

Perhaps the most accurate over-all summarization of *Fundamentals of Advanced Missiles* is that the book is neither to be regarded as a complete and thorough work on most of the subject matter it purports to cover, nor is it brief enough to be considered as a handbook. For reasons of security, no doubt, the illustrations are generally taken from obsolete equipment, such as the SCR-584 radar and the V-2 rocket. The student who is beginning for the first time to study seriously any of the disciplines involved would be better advised to use standard textbooks in physics, chemistry, and mathematics, rather than this composite work; however, as a text for a review or refresher course offered to graduate engineers and others already working in the field, this single-volume introduction should be very suitable.

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Traité de Paléontologie. L'origine des mammifères et les aspects fondamentaux de leur évolution. part 6, vol. 2, *Mammifères (évolution)*. Jean Piveteau, Ed. Masson, Paris, 1958. 962 pp. Illus. Cloth, F. 16,500; paper, F. 15,500.

The second volume of part 6 of the *Traité de Paléontologie* is the first of the two volumes on fossil mammals (other than primates) to appear. It includes consideration of the majority of the eutherian orders; essentially, only the Cetacea, Carnivora, and Artiodactyla among the eutherian orders and the non-eutherian mammals are reserved for the as yet unpublished first volume.

A number of paleontologists collaborated in getting out this extremely useful reference manual: Lavocat, Dechaseaux, Vaufrey, Viret, Saban, Hoffstetter, Guth, and Schaub, as well as Piveteau, contributed significant portions. The ordinal divisions follow essentially the classical arrangement, although the sequence of treatment (not truly significant), is at variance with the convention represented, for example, in Simpson's classification. Classification within the orders follows, of course, the interpretations of the collaborators; thus, for example, Lavocat's arrangement of the condylarths closely follows that of Simpson, and Viret's handling of the perissodactyls follows Simpson's with but minor differences. On the other hand, Schaub's treatment of the rodents and Saban's divisions of the Insectivora exhibit significant modifications.

The taxonomic entities, including genera and higher categories within the orders, are treated in an encyclopedic manner, so far as the more important diagnostic or distinguishing features are concerned, and the work is profusely