The data reveal distinct organizational patterns of cumulus clouds: in one pattern rows of cumuli are aligned parallel to the low-level wind direction; in the other, the rows are aligned at a considerable angle to the low-level wind. The distributions of these organizational patterns are shown on descriptive charts. A "Whole Sky Code" consisting of 27 categories is proposed by the authors for use in subsequent analysis of tropical cloud data.

The chief deductive results of the study are the conclusions that (i) cloud distribution and structure appear to be controlled by the large-scale planetary flow and (ii) abrupt transitions between organizational patterns of clouds are observed which are evidently related in a sensitive way to the velocity, temperature, and moisture fields. Both of these are consistent with other inferences concerning the tropical atmosphere, and the first confirms the concept underlying the global observation program now being studied by national and international scientific groups.

With great effort and ingenuity Malkus and Riehl have lifted a corner of the veil that obscures the tropical atmosphere, affording a very brief and severely limited glimpse. In almost all respects (except heights of cloud tops and bases) the TIROS satellites now provide much better data in numbers that begin to match the demands of the problem. So I am left with the impression that I have been reading the daily journal written by an early explorer of the unknown new world, full of detail about the geography encountered but in sum providing far less reliable information than one needs to know and far less than is provided on a single page of a modern atlas.

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Textbook on Dynamics: Engineering Aspects

Principles of Dynamics. Donald T. Greenwood. Prentice-Hall, Englewood Cliffs, N.J., 1965. x + 518 pp. Illus. $14.

The author has written an admirable intermediate level textbook on dynamics. Although emphasis is placed on engineering aspects, the book could be used in a physics sequence. The topics covered include dynamics and kinematics of a particle and of a system of particles, orbital motion, Lagrange's equations, rigid body kinematics and dynamics, and linear vibration theory. In the lucid exposition Greenwood maintains a good balance between too little explanation and overmotivation to the point of obscurity. Vector and matrix methods are used throughout, in line with a long overdue innovation in American textbooks on engineering mechanics. Artificial satellites and space exploration have given classical dynamics a rich harvest of new and interesting problems. Not surprisingly, the author has used many of these as illustrative examples and as exercises. We find mention of such things as the "yo-yo" despin mechanism (fortunately without the nickname) and gravity-gradient torque (which provides a natural example of the difference between center of mass and center of gravity).

I found the fundamental chapter on dynamics of a system of particles especially noteworthy. For once the reader is warned that $F = \mathrm{d}(mv)/\mathrm{d}t$ is generally incorrect when m varies! Equations of motion are derived and used for an arbitrary, moving reference point, as well as for the usual fixed or center-of-mass reference point.

Of course, I also found some things not to my taste. The term *tensor* is used superficially and without proper definition; it could have been omitted altogether. The angular velocity of a rigid body is introduced as an almost intuitively obvious concept on page 32 and used freely; on page 330 it is defined. A discussion of Euler or Cayley-Klein parameters would have been welcome because of their newly found importance in computer solutions of rigid body problems.

Finally, the following errata were noted: Problem 5-9 has only the trivial answer $I = 0$, not the answer given in the text. The first of equations (8-308) is incorrect. On page 452 nonnegativeness of the *successive* principal minors (9-33), does not guarantee that V is positive semidefinite; *all* principal minors must be nonnegative.

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Geologic Self-Analysis

The Fabric of Geology. Claude C. Albritton, Jr., Ed. Freeman, Cooper, Stanford, Calif., 1964. x + 374 pp. Illus. $8.

On the first page of the preface we are told that "the very lack of any modern book on the philosophy of geology is justification enough for this work," a statement that not only gives us the principal subject but implies that the philosophy of geology is a neglected branch of the science.

Really, *The Fabric of Geology* is not philosophy as many of us understand that term. Seventeen well-known authors examine questions like these: Can geology be called a science in its own right, or is it only bits and pieces of other sciences, applied to the earth? Does it have "laws and theories of its own"? Is it, uniquely, a historical science? A few of the 17 chapters discuss these matters in considerable detail. Other chapters are peripheral to the central theme; still others confine themselves pretty much to geologic methods, with only tangential reference to philosophic principles.

Paradoxically, the book is wide-ranging and at the same time limited in scope. It is wide-ranging because, in searching for fundamental principles, such diverse fields as paleontology, mineral deposits, geomorphology, and the "historiography" of historical geology are explored. It is rather severely limited by its unremitting search for general geologic laws and theories, which appear to be difficult to find or to formulate.

Who will be interested in geology treated in such limited fashion? Historians and philosophers of science may be expected to take note of a new self-examination in geology, and will look eagerly for general principles and laws by which the science operates. A certain, perhaps small, number of geologists will regard the book as a milestone in geologic thought. The majority will probably put it on the shelf and forget it, or will take it in small doses, at the geologic bedside. A few chapters should make excellent reading for seniors or graduate students; I particularly recommend two chapters—"Rational and empirical methods of investigation in geology" and "Historical science."

Prospective readers should look through the volume, especially at the