"Mounting the fossil skeletons [at the University of Nebraska museum] was invaluable training for me since it gave me the opportunity to learn one phase of paleontological museum work that is not often available to students of the science." [From *Digging into the Past*]

cate of continental drift.

The museologist will be interested in Colbert's ideas on museum administration, based on problems at the American Museum. He provides an account of the establishment of the professional museum journal *Curator* and the problems of designing and installing the exhibits in two large halls devoted to dinosaurs.

Colbert stresses the importance of publishing the results of scientific collecting. Only on publication of the identification and description of a fossil "does it become a truly significant object." Colbert's own scientific work abundantly illustrates this precept.

Throughout his career his wife, Margaret Matthew Colbert, daughter of a distinguished predecessor at the American Museum and illustrator of many of his books, shared in his scientific endeavors. She accompanied him on most of his foreign excursions.

The historian of science should find many points of interest, not only in Colbert's own career but in his account of events leading up to a major shift in the ideas of geologists on the driving forces in geological history and on geographic patterns of past ages. His impressions of many leading scientists with whom he was acquainted are likewise of interest. General readers will find adventure, hardship, and the pleasures of discovery set forth in a highly readable account.

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Many-Body Theory

The Fractional Quantum Hall Effect. Properties of an Incompressible Quantum Fluid. T. CHAKRABORTY and P. PIETILÄINEN. Springer-Verlag, New York, 1988. xii, 175 pp., illus. $45. Springer Series in Solid-State Sciences, vol. 85.

The fractional quantum Hall effect was discovered experimentally in 1982. It was immediately recognized as a fundamentally new macroscopic manifestation of the quantum laws underlying electrical conduction in solid matter. Initially puzzling to theorists, it was explained in its essentials within a year by R. B. Laughlin with his proposal of a liquid wave function. This work spawned a number of novel concepts, most notably that of fractional charge—the idea that an interacting many-electron system could appear, for example, to consist of a two-dimensional gas of particles of charge equal to one-third of the charge of the electron. Because of this and other remarkable features, the theory of the fractional quantum Hall effect is often felt to be the most significant advance in many-body theory of this decade.

These initial breakthroughs have been followed by progress in experimental techniques; in particular, steady advances in semiconductor technology have improved the quality of the transport measurements that identify the quantum fractions. Theoretical progress has been made as well, especially in developing the hierarchy picture, which extends Laughlin's original work to most (though not all) of the currently observed quantum states. Much remains to be done, however. On the experimental side, the development of other measurements to complement the transport data, the extension to multilayer structures, and the clarification of the even-denominator fractions are most pressing. On the theoretical side, the issues associated with higher-order and even denominators, finite temperatures, and multilayers still need a great deal of work.

One virtue of Chakraborty and Pietiläinen's book is therefore its timeliness. The field has completed an initial phase in which the most fundamental issues have been identified and largely clarified. This means that there is plenty of material for a full-length monograph. There has now come a realization that there are a number of interesting and rather diverse research paths to be followed. Any theoretical physicist who wants to be involved in these efforts needs a thorough grounding in the basics. This new book offers that.

The three main computational methods of the field—exact diagonalization of small systems and Monte Carlo and diagrammatic methods—are each explained in detail. Particularly welcome is the exposition of the "hypernetted chain" approach, which has never received a unified and clear treatment in the context of the Hall effect. The book explains the well-established applications to various aspects of the problem—the ground state and its excitations, both quasiparticle and collective. The authors discuss spin-reversed states at considerable length, a welcome choice of topic because of the experimental discovery of these states since the book was written. In sum, all of the topics for which there are firm results are covered, and covered in detail sufficient to equip anyone who has digested the contents for beginning research.

This book invites comparison with the only other comprehensive survey of the field, the second half of *The Quantum Hall Effect*, edited by R. E. Prange and S. M. Girvin. Chakraborty and Pietiläinen's focus is narrower in that they discuss theoretical issues mainly on the level of internal consistency and technical detail and mostly ignore broader implications. This is perfectly appropriate in a very specialized treatise, but the air does get a bit thin at times. Still, one could contend that this makes a good contrast and complement to the earlier book, which offers a much broader perspective. Prange and Girvin is still the best place for a beginner to start.

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Immunogenetics

Immunoglobulin Genes. T. HONJO, F. W. ALT, and T. H. RABBITTS, Eds. Academic Press, San Diego, CA, 1989. xviii, 410 pp., illus. $79.50.

One could argue that immunoglobulin genes and proteins, their structure, function, and expression, are the most intensively studied gene-product system in biology. Of course, several other genes and proteins have also been studied in detail (for example, α- and β-globin), but none displays the specificity and diversity of immunoglobulins or the programmed DNA rearrangements of immunoglobulin genes. Simply, immunoglobulin (or antibody, the alternative term) genes have been investigated more because there is so much more to investigate. This wealth of experimental results is summarized in *Immunoglobulin Genes*.

There are several characteristics of immunoglobulin expression that make it interesting. An individual mammal can produce more than ten million different immuno-