Light Microscopy

Progress in Microscopy. M. Françon. Pergamon, London, 1961; Harper and Row, New York, 1962. ix + 295 pp. Illus. $9.

This volume, the ninth of the International Series of Monographs on Pure and Applied Biology, edited by P. Alexander and Z. M. Bacq, was copyrighted by the Pergamon Press and printed in Poland. The author, professor of physics at the Sorbonne and the Institute of Optics, has devoted all 11 chapters exclusively to light microscopy.

The first chapter is a treatment of image formation, particularly with respect to the Airy disc obtained under various conditions of illumination, focus, and objective design. Chapter 2 is a skillful and critical review of phase contrast in transmitted light. In the next two chapters the author demonstrates his specialization in interference microscopy by transmitted light and reflected light respectively. Chapter 4, on reflected light, also deals with phase contrast, oblique illumination, dark field, polarized light, and the technique for examining hot metals. The fifth chapter is on accurate geometrical measurements. The next two chapters are on unpolarized, two-wave, interference microscopes and on polarizing interference microscopes.

In chapter 8 Françon again discusses the interference microscopes—this time for measurements. The next two chapters are neat reports on progress in infrared and ultraviolet microscopy and in microspectroscopy and microspectrometry. Although the final chapter is entitled "Chemical microscopy," it is strictly confined to fusion methods. The wealth of material presented in *Chemical Microscopy* (vol. 1, 1958), by Chamot and Mason, is merely mentioned in the all too short "Short bibliography."

The book suffers from the use of authors' surnames without any more specific reference to the literature, except in the incomplete bibliography. While there are very few typographical errors, some of the terms are European, for example *actionless* for inert and *microscopic* for microscopical. Nevertheless, the book will be very valuable to scientists working in many disciplines.

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Space Science

Basic Physics of the Solar System. V. M. Blanco and S. W. McCuskey. Addison-Wesley, Reading, Mass., 1961. xii + 307 pp. Illus. $7.50.

This book evolved from a series of lectures given at Case Institute of Technology to groups of research scientists, engineers, and administrators, working on problems of "space science" in the Cleveland area. Members of the group were trained in the basic physics and technology appropriate to their problems, but had little background in astronomy. The purpose of the lectures was to provide this background in a form related to current problems of space research. Only the solar system was discussed, and only selected aspects of its study were treated—those most in line with the present directions of advance.

The resulting book has the form of a textbook for university students of physics or mathematics on the senior or first-year graduate level. It has only six chapters, averaging less than 50 pages each. The subjects are coordinate systems, planets and satellites, the earth-moon system, the two-body problem, three- and n-body problems, the sun and interplanetary space. Appended to three chapters are problems for the student, and every chapter has an extensive and valuable list of references. The presentation is very compact, with few wasted words; it is also very systematic, so that, from the beginning, the large and varied array of observed data form a significant pattern. The principal physical theories applied are those of particle mechanics under gravitation, mechanics of rotating bodies, absorption and emission of thermal radiation, gravitational and radiative equilibrium of gaseous masses, and spectral emission and absorption of radiation. Relevant numerical tables and name and subject indices are given.

I cannot compare this book with others of its kind, for as far as I know there are no others. It fills a place that has long awaited it. But in comparison to an ideal book, I note the absence of three (or four) chapters: one on ionization processes and plasmas, one (or two) on line spectra, and one on the chemical composition of the sun and solar system. I can see why these were omitted, but both as an astronomer and as a physicist, I miss them. It seems to me that the dynamical sections are handled more systematically and concretely (even to worked examples) than other sections—perhaps reflecting our less complete understanding of the thermal and radiative state of the solar system. Format and typography are excellent, as usual with books published by Addison-Wesley. The whole is a very welcome contribution to the literature of the "space sciences."

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Petroleum Engineering

Formation Evaluation. Edward J. Lynch. Harper and Row, New York, 1962. xviii + 422 pp. Illus. $12.50.

Formation Evaluation represents a major contribution to the technical literature available to petroleum engineers. It may well become a standard textbook, and it should find a place on the bookshelf of development engineers throughout the industry.

Lynch has carefully compiled and presented in an excellent format the current knowledge on all phases of formation evaluation. Each phase of the evaluation process—coring, core analysis, logging, drill-stem testing, and the like—is analyzed, by first considering the theory behind the methods described, then describing their application, and finally interpreting and applying the results.

The chapter on drill-stem testing is particularly noteworthy. The author wisely observes that this test is the most suitable tool available for use in formation evaluation, in that it simulates, if properly conducted, the conditions that will obtain in a completed well. He carefully describes the tools and their use, and he cautions against the hazards that are extant in such testing. He completes the chapter with a thorough discussion of the qualitative and quantitative analysis of the results of the test.

In an appendix, Lynch presents a series of checklists to be used in logging the bore-hole. This is a step-by-step procedure for the entire logging program. It covers preparation for the logging run, a general checklist for all log runs and prints, and specific checklists for each type of log to be