elegant and meticulous work on the mitotic spindle. Their warnings concerning extrapolation from one species to another and conclusions based solely on fixed material (where, in the time required to kill, chromosomes may move as much as 0.5 micrometer and membranes may be formed or destroyed) might well be heeded by workers in other areas. The relationship of microtubules to chromosome movement is imperfectly understood. It appears that kinetochore fibers pull kinetochores during most mitotic movements, but microtubules are not attached to the poles in either plants or animals. Educated guesses are that anaphase movement is triggered by the removal of some blocking material and that kinetochore microtubules grow poleward with elimination occurring at the poles at metaphase and through anaphase. The entire fiber could thus be transported poleward, pulling the chromosome, the motive force possibly supplied by interaction between kinetochore fibers and continuous fibers.

Bahr, in a paper on mitochondrial DNA content and x-irradiation, concludes that DNA content is correlated with dry mass. He suggests that a mitochondrion containing only one DNA molecule must have a minimum dry mass, the "unit mitochondrion."

Several of the authors seem to favor strongly the chromatid folded fiber unineme structure model previously proposed by the editor, without reference to other possibilities. Although this model may prove to be correct, it can be questioned whether the current state of knowledge warrants such reverence. Consider, for example, that the model could impose magnificent acrobatics during the terminalization process on chromatids involved in chiasmata.

MAJORIE P. MAGUIRE
Genetics Foundation,
University of Texas, Austin

Analytical Chemistry

Spectrochemical Methods of Analysis. Quantitative Analysis of Atoms and Molecules. J. D. WINEFORDNER, Ed. Wiley-Interscience, New York, 1971. xiv, 530 pp., illus. $23. Advances in Analytical Chemistry and Instrumentation, vol. 9.

The two major divisions of this book cover, respectively, flame spectrometric methods of analysis and absorption and luminescence spectrometry in solutions. Each division has an opening chapter which is intended to introduce the theory by describing excitation and deexcitation processes. The chapter by Alkemade and Zeegers on these processes in flames is long (125 pp.), detailed, and inclusive. It should be of great value to serious workers in flame spectrometric research and could be read with benefit by most others who are using flame spectrometric methods. It is probably much too detailed for the beginner. The corresponding chapter by McGlynn, Srinivasan, and Maria on solution spectrometry is much shorter (35 pp.) and quite narrow in approach. It assumes considerable knowledge of the subject and treats only phosphorescence kinetics. These authors state, "We hope . . . we will provide a little information and impart a few attitudes which will be helpful to the reader." Without faulting these aims, one can wonder if they were the intentions of the editor.

Each of these introductory chapters is good in its own way. Many of the others are of much poorer quality. The appendix on signal-to-noise ratio theory in optical spectrometry, by the late W. J. McCarthy, must be mentioned as an outstanding feature of this book. It is concise and lucid and deserves to be read by the majority of us, students and workers, who are not already familiar with this topic. The mathematical analysis of signals and noise has proven its value in the design of instruments and experimental procedures, and this is the clearest introduction to the subject that I have seen.

The editor states in the preface that the book is intended for analytical chemists, for other scientists using spectrometric methods, and for students, and that it is intended to introduce the subjects and to serve as a review of recent work. I'm afraid that these several aims are too contradictory to coexist in a single volume. Each author not only has focused on a single topic, but also has focused on a single aim. Although the book offers something for almost any individual, it also has many parts which will be essentially useless for that same person.

This is not a textbook. This is not a reference book. This is not a set of reviews. This book cannot be classified. Many scientists and students will benefit by selective reading from it.

MARVIN MARGOSHES
Technicon Instruments Corporation,
Tarrytown, New York

Books Received

Advances in Agronomy. Vol. 23. N. C. Brady, Ed. Prepared under the auspices of the American Society of Agronomy. Academic Press, New York, 1971. xvi, 408 pp., illus. $21.

Advances in Electronics and Electron Physics. Vol. 30. L. Marton and Claire Marton, Eds. Academic Press, New York, 1971. xii, 334 pp., illus. $19.50.

Advances in Immunology. Vol. 13. F. J. Dixon and Henry G. Kunkel, Eds. Academic Press, New York, 1971. xvi, 336 pp., illus. $16.50.

Advances in Microwaves. Vol. 7. Leo Young, Ed. Academic Press, New York, 1971. xiv, 294 pp., illus. $18.50.

The American Ideology of National Science, 1919–1930. Ronald C. Tobey. University of Pittsburgh Press, Pittsburgh, 1971. xiv, 264 pp. $9.95.

Animals of the Arctic. The Ecology of the Far North. Bernard Stonehouse. Holt, Rinehart and Winston, New York, 1971. 172 pp., illus. $10.95.

Annual Review of Phytopathology. Vol. 9. James G. Horsfall, Kenneth F. Baker, and George A. Zentmyer, Eds. Annual Reviews, Palo Alto, Calif., 1971. xii, 494 pp., illus. $10.

Atlas of Fossil Man. C. Loring Brace, Harry Nelson, and Noel Korn. Holt, Rinehart and Winston, New York, 1971. x, 150 pp., illus. $3.25.

Biochemical Aspects of Reactions on Solid Supports. George R. Stark, Ed. Academic Press, New York, 1971. xii, 234 pp., illus. $13.50.

Computer Applications in Civil Engineering. Paul D. Spindel. Van Nostrand Reinhold, New York, 1971. viii, 216 pp., illus. $8.95.

Concentrations of Solution. A Programmed Learning Manual. Charles B. Leonard, Jr. Medical Examination Publishing Co., Flushing, N.Y., 1971. 120 pp. Spiral bound, $3.

Conceptual Foundations of Quantum Mechanics. Bernard D'Espagnat. Benjamin, Menlo Park, Calif., 1971. xviii, 494 pp., illus. Cloth, $21.50; paper, $6.95.

Contributions to Sensory Physiology. Vol. 5. William D. Neff, Ed. Academic Press, New York, 1971. xiv, 224 pp., illus. $12.50.

Current Topics in Cellular Regulation. Vol. 4. Bernard L. Horecker and Earl R. Stadtman, Eds. Academic Press, New York, 1971. xvi, 268 pp., illus. $15.

DNA Complex and Adaptive Behavior. John Gaito. Prentice-Hall, Englewood Cliffs, N.J., 1971. viii, 120 pp., illus. $6.50.

Dams and Other Disasters. A Century of the Army Corps of Engineers in Civil Works. Arthur E. Morgan. Porter Sargent, Boston, 1971. xxvi, 422 pp. $7.50.

Differentiable Dynamics. An Introduction to the Orbit Structure of Diffeomorphisms. Zbigniew Nitecki. M.I.T. Press, Cambridge, Mass., 1971. xvi, 282 pp., illus. Paper, $6.50.

Experimental Coelenterate Biology. Howard M. Lenhoff, Leonard Muscatine, and Lary V. Davis, Eds. University of Hawaii Press, Honolulu, 1971. x, 282 pp., illus. $12.

(Continued on page 566)