deciphering the geologic history of rocks. Of the 78 figures and diagrams in the body of the text, 61 present pure observational data; only 17 show hypothetical or theoretical relationships. The reference list of 198 items covers most of the important literature on the distribution of minor elements in igneous rocks.

In its favor is the fact that Shaw's book offers an extremely valuable assemblage of data, ideas, and references on the determination and distribution of minor elements in igneous rocks. In its disfavor is what I found to be a wholly inadequate index. More than half of my attempts to use the index to rediscover material already spotted in the text were unsuccessful.

In summary, Shaw's book is a must for every geochemist who needs to know what rocks are really like in the field—and who reads French.

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Science in High School

Secondary School Science Teaching Practices. H. Seymour Fowler. Center for Applied Research in Education, New York, 1964. xiv + 113 pp. $3.95.

This book reviews the changes in high school science curricula during this century and describes current science teaching practices in high school. There is no discussion of the new courses in biology, chemistry, and physics which have been developed by the Biological Science Curriculum Study, the Chemical Bond Approach Project, the Chemical Education Materials Study, and the Physical Science Study Committee. These new programs will be considered in a forthcoming volume.

In separate chapters the author discusses the four science courses commonly offered in high school—general science, biology, chemistry, and physics. For each of these courses he gives the historical background and discusses the changes in content and in teaching philosophy that have taken place over several decades. He emphasizes the role of popular textbooks in dictating the organization of science courses in high school.

Various types of courses in each subject matter area are outlined. For example, in the chapter on biology courses, Fowler describes "The Principles Course," "The Problems Course," and "The Social Implications Course." It would have been helpful if he had indicated how widely each course is, or was, used.

High school science is taught in schools that range from excellent to poor by teachers with much, and by teachers with little, preparation in science. For this reason it is not possible, in a book of this size, to do more than give some idea of what an "average" course is like. In general, this objective has been achieved. However, there are some statements about common teaching practice that may be questioned. For example, Fowler states that "most high school chemistry teachers have insisted on provision for a double period as laboratory time" (p. 46). I have visited many high schools where the time for chemistry laboratory work is limited to a single period.

One chapter is devoted to discussions of miscellaneous science courses —physical science, earth science, and advanced science courses. In another chapter, the author considers the effects of science fairs, science clubs, and other cocurricular activities on the science education of high school students.

In the final chapter, Fowler looks on the future and predicts the effects of current curriculum developments on science teaching. He emphasizes the importance of improved teacher education in science, particularly as the high school science courses become more rigorous.

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Physics Yesterday

J. J. Thomson and the Cavendish Laboratory in His Day. George Paget Thomson. Doubleday, Garden City, N.Y., 1965. xii + 186 pp. Illus. $4.95.

In 1871 Maxwell became the first Cavendish Professor of Physics at Cambridge. He was succeeded in a few years by Rayleigh, and then, in 1884, by J. J. Thomson, who was at that time 28 years old. Thirty-five years later Thomson resigned the professorship so that Rutherford could have it. But those 35 years span what is surely one of the most remarkably fruitful periods in physics. Few men have been as productive as Thomson, and no single laboratory has housed so many significant experiments per decade as did the Cavendish under his direction.

Younger scientists may best understand the character and accomplishments of J. J. Thomson by thinking of the late Enrico Fermi, despite the obvious differences in the external circumstances of the two men. Both made remarkable contributions in theoretical *and* in experimental physics. Both inspired a generation of students. Each preferred to work out his own thoughts *before* searching the literature. Each was capable of first-order mathematical sophistication, but each one also had profound physical intuition. (J. J. "liked a theory he could feel with his fingers. . . .") And not least, each was an excellent expositor of his own work.

Sir George Thomson, whose fame as a physicist rests securely on his own accomplishments, has written a pleasant book about his father and about the Cavendish of his time. If the book contains little factual material not already available in the fourth Lord Rayleigh's biography (*J. J. Thomson*, Cambridge University Press, 1942), it does provide, in compact form, a portrait of a giant whose laboratory was clearly a tremendously exciting place.

Actual biographical matter is confined to three chapters: one on Thomson's early years, one on his work for the British Government during World War I, and one on his later years as Master of Trinity College, Cambridge. For the benefit of nonscientists there is a chapter that reviews (perhaps too succinctly) the basic experimental and theoretical work on electricity up to 1890. Three chapters then discuss Thomson's crucial work on cathode rays and on the electronic charge, while his many contributions in other areas (for example, in electrical conductivity of metals, atomic structure, ion mobilities, and in early mass spectroscopy) are treated briefly in later chapters.

In view of the rather poor quality of the printing, the American edition of the book is overpriced.

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