would be more delightful than I if the Smithsonian found it mete and proper to open a new and less-limited program of providing the authoritative yet readable popular articles demanded in this scientific age. Unhappily, these volumes are not a sign of the Smithsonian throwing its limitations to the winds; they are merely a regurgitation of the old style, and one must be disrespectful of Messrs. Simon and Schuster for aiding and abetting the process.

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Geologic Evolution of Europe. Roland Brinkmann. Translated from the German by John E. Sanders. Ferdinand Enke, Stuttgart; Hafner, New York, ed. 8 (condensed version of vol. 2), 1960. vi + 161 pp. Illus. $8.50.

Emmanuel Kayser's great *Lehrbuch der Geologie* was one of the cornerstones of a good geological education during the first quarter of this century. It grew into four dryly authentic volumes during the course of seven editions and was full of complicated Teutonic sentences and fossil names. Then Roland Brinkmann cut it in half, expunged unnecessary terminology, and infused it with well-founded, dynamic interpretations to create the new two-volume Kayser-Brinkmann *Abriss der Geologie*, which has now gone through eight editions of its own.

The second volume of the *Abriss* is, in fact, a streamlined account of the geologic evolution of Europe, with notes on other parts of the earth; it is this which Sanders has halved again to make the book here reviewed. He has transformed the original 360 pages of German into 161 pages of English by dropping three chapters entirely, by deleting sections of other chapters that deal with areas outside of Europe or with paleontology, and by condensing discussion and reducing fossil illustrations from 58 to 19 plates. The result is a highly abbreviated, synoptic account of the physical evolution of Europe from the Precambrian to the Recent era, in which Kayser's familiar illustrations of fossils and rocks are about all that remain to indicate its lineage.

American and British geologists should be grateful to Sanders and the publishers for making this book available. Now they can read in English about the historical geology of the European mainland from two up-to-date and complementary master sources: the complete translation of Alpinist Maurice Gignoux's *Géologie Stratigraphique* by Gwendolyn Woodford (Freeman) and this condensation of Variscanist Brinkmann's *Historische Geologie*.

In producing this book, Sanders has carried out well the difficult task of absorbing in one language and rewriting and editing in another which is the function of good scientific translating. There are few infelicities due to the translating and no important alterations of meaning. In the subject matter treated, the book is current with all but the most recent advances (such as those in Precambrian and Danian correlation). My only serious criticism is that the condensation is so drastic that it detracts from the coherence of the treatment and creates a didactic effect which was not conspicuous in the original book. Moreover, the new section, "History of European geology," is too abbreviated to be of much use to a beginner and is unnecessary for the geologist who is already well-enough informed to enjoy the rest of the book. Two curious historical errors should be corrected. H. B. de Saussure did not coin the word geology (page 2); it was used 83 years before his birth in M. P. Escholt's *Geologia Norwegica* (1657). The picturesque founder of the Carboniferous and Cretaceous systems was not J. B. but J. J. d'Omalius-d'Halloy (pages 44, 101, and 114).

We have here, nevertheless, a convenient and readable outline and source book, rich in lively reconstructions of the physical history of Europe. The correlation charts, taken with little change from the *Abriss*, form an excellent supplement to the National Research Council's correlation charts (as yet incomplete) for North America. The enormous structural complexity of Europe is well portrayed in words and sketches. The filling, stripping, and migration of interspersed basins and swells; the growth and eventual stabilization of successive overcrossing fold belts; the zones of flat thrust faulting and gravity sliding; the evolution of diapirically intruded, cratonal, sedimentary blankets—all are brought to life and interrelated. The outlook is that of a man (Brinkmann) who sees a natural syntax and episodic global similarities in rocks and historical events. Quite apart from the fact that this book offers a convenient way to learn about, or to refresh one's memory of, the major features of geological history in Western and Central Europe, it provides a needed counterbalance to the currently ascendant philosophy of gradualism. It is a good book to have around.

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Non-relativistic Quantum Mechanics. An introduction. R. M. Sillitto. Quadrangle Books, Chicago, Ill., 1960. vii + 230 pp. $7.50.

This text was written for the honors course in British schools, a course that does not have a direct counterpart in American colleges. It is a formal introduction to the methods of quantum mechanics but provides only a few illustrative examples and applications of the major techniques. In general, it is quite sketchy and does not contain enough material for use in beginning graduate courses, the level at which quantum mechanics is usually taught. The approach is axiomatic rather than historical; on the whole, the discussions are standard and brief. The topics are also standard, with few of them getting the detailed analysis necessary for their understanding.

GEORGE WEISS
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Characteristics of Teachers. David G. Ryans. American Council on Education, Washington, D.C., 1960. 416 pp. $7.50.

This is a volume for researchers. It is as technically careful a report of a study about teachers as can be found. As the prefatory note suggests, it "may well lead to improved selection, training and evaluative procedures for personnel in the teaching profession."

Teacher characteristics, a term used here to mean the classroom behavior of teachers and behavior conditioning factors, are regarded as the clue to the establishment of criteria by which the effectiveness of teachers can be measured.

The search for a reliable set of teacher competencies has often led teacher training institutions, teachers'

professional organizations, state departments of education, and other organizations and individuals to settle for criteria by compromise. This study may well mark the beginning of a new era in the development of criteria based on fact.

The director of the study, David G. Ryans, was professor of educational psychology and research at the University of California (Los Angeles) and is now chairman of the department of educational psychology at the University of Texas. He is recognized by colleagues in his field as one of its leading scholars.

This book is not only required reading for the student of educational research, but it also should give enlightenment and encouragement to high school guidance counselors, the staff in higher institutions preparing teachers, superintendents of schools—in fact, to all who have a concern in the education and employment of teachers and in the improvement of the teaching function.

WILLIAM P. VIALL
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Handbuch der Pflanzenanatomie. vol. 6, pt. 1, *Schizophyzeen*. Lothar Geitler. Gebrüder Borntraeger, Berlin, 1960. viii + 131 pp. Illus. DM. 46, subscription; DM. 57.50.

Faculty members on library committees as well as librarians wince at the announcement of each new monographic series in the biological sciences. Book funds are nearly depleted *ab initio* by standing orders. Nonetheless, thanks to the emphasis placed on research by government and industry, the number of libraries that can stand the financial strain is sufficiently large to guarantee publishers a profitable market. Small private institutions and individuals are casualties. So it is that each new series, and each component monograph, is received with mixed feelings. In some instances the duplication of material in existing series is so great that profit and prestige motives would seem to overshadow considerations of need and usefulness. The present monograph suffers only moderately from duplication, but the series of which it is a part has been a victim of overlapping by several newer series. The *Handbuch der Pflanzenanatomie*, founded by K. Linsbauer and continued by G. Tischler and A. Pascher, can claim several classical treatises, including Kylin's *Anatomie der Rhodophyceen* (1937). Although the first edition of the *Handbuch* was never completed, a second edition is being prepared under the direction of W. Zimmermann and P. Ozenda.

Geitler is a renowned plant cytologist and systematist of blue-green algae, so his treatment in the *Handbuch* may justly be considered authoritative. The large amount of significant literature that has appeared since the first edition (1936) has been skillfully incorporated into this revision, which otherwise closely follows the original version. A notable change is the omission of the section on endophytic Cyanophyceae, which Geitler has recently treated elsewhere (in *Handbuch der Pflanzenphysiologie*, vol. 11, 1959). Among earlier reviews of the cytology, morphology, and reproduction of blue-green algae may be mentioned Geitler's treatment of Cyanophyceae in Pascher's *Süsswasser-Flora* (1925), in Rabenhorst's *Kryptogamen-Flora* (1930–1932), and in Engler and Prantl's *Natürlichen Pflanzenfamilien* (1942). Whether the currency gained in the present work is worth the price must be decided by each book-buying committee; I am happy that the liberal policy of my institution permits an affirmative decision.

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New Books

Reprints

And There Was Light. The discovery of the universe. Rudolf Thiel. Translated from the German by Richard and Clara Winston. New American Library, New York, 1960. 398 pp. Illus. $0.75.

The Book of Scientific Discovery. How science has aided human welfare. D. M. Turner, Barnes and Noble, New York, ed. 3, 1960. 301 pp. Illus. $1.75.

A Compendium of Spherical Astronomy. With its applications to the determination and reduction of positions of the fixed stars. Simon Newcomb. Dover, New York, 1960.

Concepts of Space. The history of theories of space in physics. Max Jammer. Harper, New York, 1960. 222 pp. Illus. $1.40.

Darwin's Place in History. C. D. Darlington. Macmillan, New York, 1961. 100 pp. $2.

Dynamics. Horace Lamb. Cambridge Univ. Press, New York, 1960. 362 pp. $3.75.

Dynamics of Rigid Bodies. William Duncan MacMillan. Dover, New York, 1960. 491 pp. $2.

An Elementary Treatise on Curve Tracing. Percival Frost. Revised by R. J. T. Bell. Chelsea, New York, ed. 5, 1960. 224 pp.

The Exploration of Space. Arthur C. Clarke. Fawcett Publications, Greenwich, Conn., 1960. 192 pp. Illus. $0.50.

The Foundations of Arithmetic. A logico-mathematical enquiry into the concept of number. Gottlob Frege. Translated by J. L. Austin. Harper, New York, 1960. $1.25.

A History of the Theories of Aether and Electricity. vol. 1, *The Classical Theories*; vol. 2, *The Modern Theories, 1900–1926*. Sir Edmund Whittaker. Harper, New York, 1960. $1.95 each.

An Introductory Treatise on Dynamical Astronomy. H. C. Plummer. Dover, New York, 1960. 365 pp. $2.35.

An Introductory Treatise on the Lunar Theory. Ernest W. Brown. Dover, New York, 1960. 308 pp. $2.

A Manual of Spherical and Practical Astronomy. vol. 1, *Spherical Astronomy*, 708 pp.; vol. 2, *Theory and Use of Astronomical Instruments* (method of least squares), 631 pp. + plates. William Chauvenet. Dover, New York, 1960. $2.75 each; set, $5.50.

The Mechanism of Evolution. W. H. Dowdeswell. Harper, New York, 1960. 125 pp. $0.95.

Molluscs. J. E. Morton. Harper, New York, 1960. 232 pp. Illus. $1.40.

Natural Selection and Heredity. P. M. Sheppard. Harper, New York, 1960. 209 pp. $1.35.

Our Atmosphere. Theo Loebsack. Translated from the German by E. L. and D. Rewald. New American Library, New York, 1961. 190 pp. Illus. $0.50.

Petrology for Students. An introduction to the study of rocks under the microscope. Alfred Harker. Cambridge Univ. Press, New York, 1960. 289 pp. Illus. $1.95.

Physics for Everybody. Germaine and Arthur Beiser. Dutton, New York, 1960. 191 pp. Illus. $1.15.

Principles of Stellar Dynamics. S. Chandrasekhar. Dover, New York, 1960. 323 pp. Illus. $2. Republication of *Principles of Stellar Dynamics* (Univ. of Chicago Press, Chicago, 1942); "Dynamical Friction" pts. 1 and 2 [*Astrophyhs. J.* **97**, No. 2 (1943)]; and "New Methods in Stellar Dynamics" [*Ann. N.Y. Acad. Sci.* **45**, article 3 (1943)].

Rats, Lice and History. Being a study in biography, which, after twelve preliminary chapters indispensable for the preparation of the lay reader, deals with the life history of typhus fever. Hans Zinsser. Bantam Books, New York, 1960. 238 pp. Illus. $0.50.

Readable Relativity. Clement V. Durell. Harper, New York, 1960. 157 pp. Illus. $1.25.

Statistical Thermodynamics. A course of seminar lectures. Erwin Schrodinger. Cambridge Univ. Press, New York, 1960. 95 pp. $1.65.

The Universe Around Us. Sir James Jeans. Cambridge Univ. Press, New York, 1960. 307 pp. Illus. $1.95.