good deal of justifiable telescoping—for example, in the simultaneous presentation of the singular and plural of the cases. The explanations of grammar are usually clear and well illustrated, and they are often accompanied by some valuable original comments. There is an abundance of exercise material, and it appears to be adequate. As would be expected, the vocabulary is scientific from the outset, an especially good selection having been made in the way of introductory material. Mention should be made of the final chapter, devoted to wordbuilding.

The readings are possibly the outstanding feature of this book. Beginning with lesson 7, each lesson includes readings (with individual vocabularies) in four fields: aeronautical engineering, biology, chemistry, and physics. These readings have been drawn, with excellent judgment, from Soviet sources, and they should prove invaluable in helping students to acquire a basic vocabulary in these fields. I consider these readings attractive enough to warrant the use of this text as a supplementary "scientific reader" for students taking a traditional course in general Russian. The use of these readings in the classroom may present something of a problem for some teachers. I myself would prefer to work out some elementary readings in various scientific fields for classroom use; this would allow me to assign the textbook readings as outside reading, to each student according to his specialty or choice.

Incidentally, the conscientious student, studying by himself, should find this manual extremely helpful. The grammar by Perry will also be useful to such students, though I think they will find the Turkevich grammar less formidable and probably more attractive.

If I were editing a second edition, I should make some minor changes, some of them deletions. I would omit the grammatical introduction completely and incorporate that material in the text; I question the value of introducing such material before the course is begun. Likewise I should prefer to see the paradigms on pages 19 and 26 omitted or, in any case, placed farther along; students who wish to see the complete paradigms in advance can consult the appendix. I feel the same way about the "Tense and aspect review" on pages 128–31; this includes forms that have not been treated at that point. It is misleading to describe the accusative as expressing duration of time for an action begun (page 28); actually, the accusative can express duration in the past, present, or future. Many students will find it difficult to understand why **избега́ть** is a "negative verb"; it would be much better to omit it. On page 39 an example (such as **спа́льня, спа́лен**) should be given for a nominative in **-я** with an inserted **-е-** in the genitive plural. On page 87 the prepositional singular of the type noun **крите́рий** has been omitted. It is misleading to describe the perfective as the "tense of narration" (page 112); the imperfective aspect may also be used for narration. On page 136 the abbreviation **кпд** is not explained; it stands, of course, for **коэфициéнт полéзного дéйствия.** On page 141, line 3 should read, "if the *stem* ends in a vowel." On page 144 the description of relative and interrogative pronouns as identical should be carefully limited to **кто** and **что.** On page 178 it would be helpful to give an example of the use of **бóльше всегó.** On page 227, a more important meaning of **занима́ть** is "to occupy," and on page 228, **относи́ться** means "to refer *to,* to concern."

These are the misprints I found: On page 7 **ученой** should be substituted for **ученной** and **заранее** for **заранье.** On page 52, read **окисле́ние** for **окисле́не.** On page 57 the bottom line should read **"-ь** becomes **-ью** in both columns." On page 143, read **объясняйте** for **бъясняйте.** On page 161, read **сильно** for **сильпо.** On page 299, change **прикле́йть** to **прикле́ить.**

There is a pressing need to teach as many of our scientists as possible to read Russian, the sooner the better. That is one of the reasons why I feel that we are indebted to John and Ludmilla Turkevich for this excellent and important contribution.

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Taschenbuch der Botanik. vols. 1 and 2. Walter Mevius. Thieme, Stuttgart, Germany (order from Intercontinental Medical Book Corp., New York). vol. 1, 1959, 291 pp., $3.05; vol. 2, 1958, 195 pp., $3.60.

The first volume of the two "pocket books of botany" (actually they are much larger than the title indicates) deals with plant physiology, in a thoroughly up-to-date manner. It includes reproductions of structural formulas of organic compounds and discussions of the physical chemistry of intricate life processes. The reader will be amazed to see, from this book, what an extensive background in the physical sciences is required of students of botany in Germany.

The second volume, *Plant Taxonomy,* condenses into 188 pages a large amount of material, including numerous drawings. The material, naturally, has to be tightly packed, and the volume is therefore more suitable for use as a reference manual than as a textbook.

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The Far East. A modern history. Nathaniel Peffer. University of Michigan Press, Ann Arbor, 1959. xviii + 489 pp. $7.50.

Nathaniel Peffer, professor of international relations at Columbia University, has devoted a good share of a scholarly lifetime to the Far East. His book is a skillfully fashioned, well-written, intelligent guide to the background of China, Japan, and their neighbors.

He sees China and Japan—particularly China—as the core of the Far East. He does his best to follow the mainstreams of historical development, without diversions or inconsequential details. His book is not for the student cramming facts for an examination but for discerning readers who want to know and to understand how the contemporary situation in East Asia came to be as complex and complicated as it is.

Peffer gives the impression that he thinks while he writes. His is no dry chronicle. He has no pet theories to pawn, no prophecies to offer. His insight comes from hard work and careful study. He does not shy away from personal judgments. His views may arouse sharp disagreement, but they will always command respect.

His story is that of the intrusion of western traders, missionaries, soldiers, sailors, and diplomats into the ancient but changing East. He sketches the intricate patterns of the social fabric of traditional China and Japan and traces with infinite finesse the colorful but imperfect designs which emerged (and are emerging) from a century of blending of East and West. The West had its historical moment of supremacy, only to recede in the backwash of World War II.

As premises for his provocative conclusions, Peffer makes some interesting suggestions about the importance of China (page 7), the spiritual health of

the Japanese people (page 31), the role of the Russians and communism in 20th-century China (page 294), the influence of Sun Yat-sen (page 306), the Communist victory in postwar China (page 443), and the stature of Chiang Kai-shek (page 444).

He believes the East "yielded, recovered, and has now found its feet again, though it must grope slowly and painfully for new paths of life. Whether it finds them, and how and with what consequences both to itself and the outer world, will determine the shape of the history of the next hundred years" (page 482).

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Researches in Geochemistry. Philip H. Abelson, Ed. Wiley, New York; Chapman and Hall, London, 1959. x + 511 pp. Illus. $11.

This impressive volume on various aspects of modern geochemical research presents 23 short essays that are the outgrowth of a series of seminars held at the Geophysical Laboratory of the Carnegie Institution of Washington and at the Johns Hopkins University. Philip H. Abelson (director of the Geophysical Laboratory), editor as well as contributor, has done an excellent job of bringing together in one volume some of the recent developments in the field of geochemistry. It would be presumptuous for one person to attempt to evaluate each contribution, for these essays cover a broad spectrum in the fields of chemistry and physics applied to geology. I will, therefore, mention briefly the subjects discussed and offer some general comments on the volume as a whole.

Geochronology of crystalline rocks based on the lead-uranium, rubidium-strontium, and potassium-argon methods is reviewed by Tilton and Davis. Methods and evaluation of C^{14} age determinations are given by de Vries. Reed discusses the techniques and application of activation analysis, with special emphasis on the U-Pb-Th-He abundances to explain the age discrepancies found for meteorites. Libby reports that the short half-life of the tritium produced in atomic bomb tests can be used to determine water balance and cycles in the atmosphere and ground water. Two additional review papers within the field of nuclear geology clearly show that isotope ratios in naturally occurring materials can be used to estimate temperatures of mineral formation and degree of chemical equilibria and, in some cases, may suggest genesis of certain mineral deposits. Epstein discusses O^{18}/O^{16} variations as applied to thermometry and chemical equilibria, and Ault reviews the present data on S^{32}/S^{34} to show that fractionation can be directly tied to certain geological processes.

Two papers discuss theoretical limitations of the chemical environment during formation of ore deposits as related to the physical chemistry of the ore fluids. These are papers on magmatic gas phase, by Krauskopf, and on chemical environment of low temperature ore transport, by Barton. Thompson gives further theoretical treatment to metasomatic processes and proposes application of the phase rule to this problem by assuming local equilibrium. The often overlooked problem of reaction rates and metastability in low-temperature and low-pressure environments is summarized by Garrels.

Arrhenius discusses the source and history of pelagic sediments deposited on the ocean floor within the last 10,000 years. Keith and Degens illustrate the possibility of distinguishing between ancient marine and fresh-water sediments by use of trace-element ratios. The chemistry of the evolution of petroleum is treated by Hanson, and Abelson summarizes his recent researches on the stability of organic compounds during geological time.

Reports on laboratory studies on synthesis of selected mineral groups play an important part in this book. Kullerud's work on sulfide systems illustrates the rapid strides taken in understanding the physical-chemical relationships between the common sulfide minerals of ore deposits. Experimental studies of carbonate systems are reported by Goldsmith. Boyd has overcome the difficult problem of hydrothermal synthesis of amphiboles, and his studies shed light on the pressure-temperature conditions of the amphibolite facies. Eugster's work on hydrothermal synthesis of ferrous-ferric silicates illustrates the importance of reduction and oxidation in certain metamorphic facies. The effectiveness of combining detailed mineralogical work with phase studies on specific geological problems is demonstrated in the paper by Milton and Eugster on mineral assemblages of the Green River formation.

MacDonald reviews the current concepts of the earth's chemical composition as deduced from seismic data, the abundance of the elements within the earth's crust, meteorites, and the surface of the sun. He suggests that the earth has a composition similar to that of chondritic meteorites, with an iron-silicon core and a chemically differentiated mantle whose composition lies between that of dunite and that of basalt. The role of high pressure on chemical equilibria and transitions to denser polymorphs below the earth's crust is discussed by Clark. Hawkes' essay on geochemical prospecting describes the practical application of geochemistry to the solution of geological problems. Chayes presents experimental evidence on diffraction effects of short-range ordering in layered sequences which may be a serious problem in determining temperature-dependent order-disorder changes in the subsolidus regions of silicate systems by x-ray diffraction techniques.

These short articles average about 21 pages each and contain a total of 859 cited references. Unfortunately, there is neither an index nor a summary. The editing of this book is outstanding; I was unable to find any serious errors or omissions. Abelson's efforts to compile this excellent collection of papers will be welcomed by workers in the field of geochemistry and by geologists who find it difficult to maintain contact with this modern research. An interesting aspect of this book is the emphasis placed on nuclear geology and thermodynamics by scientists in this country as compared to the Fennoscandian and Russian approaches, wherein geochemical research is concerned mainly with the distribution and abundance of elements in nature. This trend in the United States is undoubtedly related to the rapid advances made in instrumentation as a result of basic research in physics and chemistry.

Abelson begins the preface by stating, "A major revolution in research activity in earth science has been going on for the past decade." This revolution has left the geologist a little breathless and somewhat dismayed, but the papers comprising this volume constitute a tremendous stimulation and challenge. These great advances in geochemistry and geophysics now make it necessary for the geologist to close the widening gap between concepts derived from laboratory research and theoretical analysis and the application of these concepts to field problems. These advances point clearly to the great need for more detailed information on the mineralogy and petrol-