nately, the authors have not made obvious use of the geologic glossary published by the American Geological Institute, and a few of their definitions are contrary to common or proper usage. Individual topics that might be discussed in more detail include rock mechanics, the origins of caves and coral reefs, types of glacial deposits, continental drift, and oil shales. The material in chapter 12, dealing with lakes and basins, might be worked into other chapters. Topics that are treated especially well include geologic time and the evolution of coastlines.

Very careful editing has eliminated virtually all errors and has produced a most attractive volume. Undoubtedly the book will continue to be widely used as a text in beginning geology courses.

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British Topographic Botany

Flora of the British Isles. A. R. Clapham, T. G. Tutin, and E. F. Warburg. Cambridge University Press, New York, ed. 2, 1962. xlvii + 1269 pp. Illus. $13.50.

Atlas of the British Flora. F. H. Perring and S. M. Walters, Eds. Nelson, New York, 1962. xxvi + 432 pp. $22.50.

Modern topographic botany had its origin in the British Isles with the work of Hewett Cottrell Watson. Now, 130 years after Watson's first book was published, two very fine additions to the literature on this subject have been made. Because of their background of intensive floristic work, British taxonomic botanists have sometimes been accused of being parochial in their outlook, but their concentration upon the details of local floras shows up to great advantage in these two books. Also, by including the results of recent monographic work, wherever this seemed reasonable, information on the taxa here recognized has been readied to take its place in the forthcoming *Flora Europaea.*

"Clapham, Tutin, and Warburg" became standard as soon as it was published in 1952. In this second edition, more information on the species has been added, even though the total number of pages has been reduced by the use of a larger format. In addition to very full morphological descriptions and accounts of range and ecological preference, the authors give flowering dates, pollination biology, seed or fruit dispersal systems, chromosome numbers, and, finally, the Raunkiaer life form. It is hard to suggest what more could be added without going to the detail of the "Biological Flora of the British Isles," another worthy effort that is being published, species by species in the *Journal of Ecology.* In addition, several of the keys have been considerably modified in this edition.

Naturally, the authors point out that, despite the combination of intensive experimental field and herbarium studies of variable species and "critical groups" during the last decade, much remains to be done. Nevertheless, it is probable that for many years this excellent *Flora* will be used with appreciation by all who have cause to work on the British flora and by many whose concern with it is incidental.

Our knowledge of the distribution of vascular plants in Britain has also been materially improved in the last 10 years, largely as a result of the field work undertaken in connection with the "Distribution Maps Scheme" of the Botanical Society of the British Isles. It is, therefore, particularly pleasing to be able to have the results of this admirable scheme available at the same time as this second edition of the *Flora.*

In the production of the *Atlas of the British Flora,* the energies of Britain's indefatigable band of amateur botanists have been harnessed to the successful performance of an immense task. It is the admirable function of the Botanical Society of the British Isles to bring amateur and professional botanists into close and productive contact. The happy result of this collaboration is a beautifully produced series of "dot" maps that treat all generally accepted British native species (excluding critical segregates) and most well-established introductions.

For the purpose of producing the maps, the country was divided into ten-kilometer squares of the National Grid, and these were allocated to one or more individuals or societies for listing the flora on standardized cards. Special expeditions were organized to remote areas to fill those cards that would otherwise have remained incomplete. In addition, herbarium records were used, so that recent changes of range might be indicated to some extent, and all critical species were checked by a large roster of experts. The maps were then produced with the aid of automatic machines. To assist users of the maps, a pocket in the back of the book contains a series of transparent overlays that help greatly in suggesting the possible natures of limiting factors in the distributions of particular taxa. These overlays represent, respectively, the river systems, vice-counties, altitude, temperatures at different times of the year, geology, humidity, rainfall, grid squares, and, for the benefit of those who would work further, "under-worked squares." There is also a most interesting account of the manner in which the scheme was put into operation. Hopefully, this will suggest means whereby it might be possible to follow a similar pattern of work elsewhere, even in North America.

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General Chemistry Texts

The Nature of Atoms and Molecules. A general chemistry. Ewing C. Scott and Frank A. Kanda. Harper, New York, 1962. xii + 765 pp. Illus. $8.

Fundamental Chemistry. Donald H. Andrews and Richard J. Kokes. Wiley, New York, 1962. xv + 814 pp. Illus. $7.95.

These two new general chemistry texts differ widely in the scope and sophistication of the material presented. The authors of each claim that their book assumes no previous training in chemistry or physics.

The Nature of Atoms and Molecules is the more traditional in approach to the subject; more than half of its chapters and two-thirds of its bulk are devoted to descriptive chemistry of the elements. Much space is devoted to the history and occurrence of the common elements and to the uses and industrial processes associated with them. The authors employ electronegativity as their major tool in explaining chemical reactivity. There is little attempt to show relationships between chemical behavior and thermodynamic and kinetic factors. The chapters on the metals each contain a section on analytical properties. Organic chemistry is treated briefly in the same chapter with the inorganic chemistry of carbon. A chapter on giant molecules

includes organic polymers along with graphite, silicates, and other inorganic polymers.

This text appears to be best suited for use in a "terminal" course in general chemistry, intended for those students who do not intend to continue in science.

A blurb on the dust jacket of *Fundamental Chemistry* hails it as the first chemistry text to meet the requirements of students who have completed such new high school curricula as those developed by the Chemical Education Materials Study (CHEM), the Chemical Bond Approach Committee (CBA), and the Physical Science Study Committee (PSSC). The book attempts to meet what is probably the most serious problem facing today's teacher of elementary college chemistry: that of the great disparity in high school science and mathematics training among the students. Thus the early chapters deal with such basic topics as the nature of a model, large numbers, significant figures, and even some elementary calculus. But the pace accelerates enormously, and the student is soon confronted with the Boltzmann distribution (chapter 8), transition state theory (chapter 14), and crystal field theory (chapter 25).

There are few innovations in the presentation; rather I would characterize the book as a traditional treatment of much of the material ordinarily included in courses in (i) general chemistry, (ii) undergraduate physical chemistry, and (iii) a senior course in inorganic chemistry. What is *not* traditional is the attempt to treat this enormous scope in one text. Treating so many ideas necessitates that, in many cases, they be presented as full-blown concepts, rather than as a logical development. For example, the student may wonder why it is "reasonable to assume" that the increase in bond energy due to polarity is related to the square of the difference in electronegativities of the bonded atoms (page 158). In spite of the condensation of the presentations, the writing is lucid and accurate.

The elements of thermodynamics are introduced in chapter 12, and these concepts are then employed extensively in chapter 13 (on chemical kinetics), chapter 14 (on equilibrium), and to a limited extent in chapter 16 (on electrochemistry). Tabulation and discussion of thermodynamic properties make up major portions of the chapters on the descriptive chemistry of the elements. Descriptive chemistry comprises chapters 18, 19, 20, 23, and part of 21, roughly 140 of the 772 pages of text. Crystal structure and stereochemistry are treated in a separate chapter, and these aspects are not given prominence in the descriptive chapters. Chapter 24 (on metals and alloys) gives a nice discussion of metallic packing and bonding, with brief mention of electron-deficient molecules and phase diagrams. Chapter 25, on complex ions, deals with stereo and optical isomerism, magnetism, and crystal field theory, all in 19 pages. The extensive sets of problems are chiefly of the physical chemistry type and should be a challenge to any class.

Summing up, I would say that *Fundamental Chemistry* is definitely a text for the superior student, or, at least, the better-prepared-than-average student, such as, perhaps, the CHEM, CBA, and PSSC alumni. It should be fine for those sophomore general chemistry courses that enroll students who have completed college physics. It is definitely *not* a book for self-study. The great number of ideas presented, and presented so tersely, will require much amplification and explanation in lecture and recitation. In this regard, I suspect a lecturer might find himself more circumscribed by this text than by most.

Both of these books are handsomely illustrated and well printed on good paper; the pages have adequate, but not generous, margins.

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New Books

General

An Alternative to War or Surrender. Charles E. Osgood. Univ. of Illinois Press, Urbana, 1962. 183 pp. Paper, $1.45.

Automation. Implications for the future. Morris Philipson, Ed. Random House, New York, 1962. 456 pp. Paper, $1.95.

Axiomatics. R. Blanche. Translated by G. B. Keene. Free Press of Glencoe (Macmillan), New York, 1962 (reprint of 1959 ed.). 70 pp. Paper, $1.25. A translation of the first three (of five) chapters of *L'Axiomatique*, ed. 2, 1959.

Camp Century. City under the ice. Walter Wager. Chilton, Philadelphia, 1962. 151 pp. Illus. $3.95. An account of the camp constructed by the U.S. Army Corps of Engineers 138 miles east of Thule.

The Case of the Missing Link. Eleanor Clymer. Basic Books, New York, 1962. 118 pp. Illus. $3.75 (juvenile book).

The Cholera Years. The United States in 1832, 1849, and 1866. Charles E. Rosenberg. Univ. of Chicago Press, Chicago, 1962. 267 pp. $5.95.

Elementary Teachers Guide to Free Curriculum Materials. Patricia H. Suttles, Ed. Educators Progress Service, Randolph, Wis., ed. 19, 1962. 353 pp. $7.50.

Engineering as a Career. Ralph J. Smith. McGraw-Hill, New York, ed. 2, 1962. 404 pp. Illus. Paper, $4.40; cloth, $5.95.

Environmental Engineering and Metropolitan Planning. Proceedings. John A. Logan, Paul Oppermann, and Norman E. Tucker, Eds. Northwestern Univ. Press, Evanston, Ill., 1962. 279 pp. $7.50. Proceedings of the first conference on environmental engineering and metropolitan planning held at Northwestern University.

A Guide to ALGOL Programming. Daniel D. McCracken. Wiley, New York, 1962. 114 pp. Illus. Paper, $3.95.

High in the Thin Cold Air. The story of the Himalayan expedition led by Sir Edmund Hillary. Sir Edmund Hillary and Desmond Doig. Doubleday, Garden City, N.Y., 1962. 263 pp. Illus. $6.95.

How To Prepare Effective Engineering Proposals. Emerson Clarke. TW Publishers, River Forest, Ill., 1962. 221 pp. Illus. $6.95.

Kill and Overkill. The strategy of annihilation. Ralph E. Lapp. Basic Books, New York, 1962. 197 pp. $4.95.

The Man Who Conquered Pain. A biography of William Thomas Green Morton. Grace Steele Woodward. Beacon Press, Boston, 1962. 189 pp. Illus. $3.50.

The Mars Project. Wernher von Braun. Univ. of Illinois Press, Urbana, 1962 (reprint of 1952 ed.). 99 pp. Paper, $0.95.

Medicines for the Union Army. The United States Army laboratories during the Civil War. George Winston Smith. American Inst. of the History of Pharmacy, Madison, Wis., 1962. 124 pp. Illus. Paper, $2.75.

Music, Acoustics, and Architecture. Leo L. Beranek. Wiley, New York, 1962. 586 pp. Illus. Until 25 December, $15; $17.50.

Queen Rearing. Harry H. Laidlaw, Jr. and J. E. Eckert. Cambridge Univ. Press, London; Univ. of California Press, Berkeley, ed. 2, 1962. 173 pp. Illus. A chapter on ailments of the queen bee has been added in this edition.

Relativity in Illustrations. Jacob T. Schwartz. New York Univ. Press, New York, 1962. 117 pp. Illus. $5.

Rivers in Harness. The story of dams. Allan H. Cullen. Chilton, Philadelphia, 1962. 180 pp. Illus. $3.95.

The Search for Planet X. Tony Simon. Basic Books, New York, 1962. 118 pp. Illus. $3.75 (juvenile book).

A Short History of Scientific Ideas. To 1900. Charles Singer. Oxford Univ. Press, New York, 1962 (reprint of 1959 ed.). 543 pp. Illus. Paper, $2.45.

Stars, Mosquitoes, and Crocodiles. The American travels of Alexander von Humboldt. Millicent E. Selsam, Ed. Harper and Row, New York, 1962. 192 pp. Illus. $3.50.