protein fibers, dyeing and finishing of regenerated protein fibers, identification of fibers from proteins, uses of fibers from proteins, and so forth.

This book should be most useful for its presentation of accumulated data, taken by Wormell from his own works and the general literature. The material on spin dopes, extrusion of fibers, cross-linking treatments, and physical and chemical properties should be very helpful to scientists and technologists interested in protein fibers, as well as many students of man-made fibers in general.

I found the "corpuscular theory" far from convincing, especially when applied to a fiber such as silk. The emphasis on this theory may actually be confusing to a person unfamiliar with protein fibers, but on the whole the book is a useful compilation that will be helpful to workers in the field.

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Sex in Microorganisms. A symposium presented 30 Dec. 1951 at the Philadelphia meeting of the AAAS. D. H. Wenrich, Ivey F. Lewis, and John R. Raper, Eds. AAAS, Washington 5, 1954. 362 pp. Illus. $5.75 (Members, $5).

Sex in Microorganisms is broadly conceived to include anything related to the reproductive cycles of protozoa, algae, fungi, bacteria, and viruses. The subtitle to the volume is unnecessarily restrictive, since many topics are not only presented in greater detail than was possible at the Philadelphia meeting, but they are also more up-to-date than is implied. There is at least one 1953 reference in each article. As is to be expected in a symposium, there is considerable variation in the manner in which the different subjects are treated by the different authors. The papers themselves range in length from 11 pages (bacteriophages) to 132 pages (protozoa).

The volume opens with a brief and clear outline by N. Visconti of the life history, methods of crossing, and genetic observations of the virulent T-phages of *Escherichia coli,* with emphasis on important dissimilarities to equivalent genetic phenomena as known in higher organisms. The sexual behavior of bacteria, as inferred from genetic recombination in strain K-12 of *E. coli,* is discussed by J. Lederberg and E. L. Tatum in a somewhat reminiscent mood. Here the principal emphasis is on similarities to genetic events in higher organisms. Possible relationships to bacterial transformation and transduction are mentioned, but in a manner that seems to imply that little is known of transformations, and that only since 1951. W. G. Hutchinson and H. Stempen discuss the evidence for sexuality in bacteria from studies of morphology, especially from reported examples of conjugation, and they remark on the unsatisfactory present state of bacterial cytology. The diverse life cycles and sexual mechanisms found in the fungi are reviewed by J. R. Raper, and classified according to (i) the occurrence and extent of haploid, dicaryotic, and diploid, phases, (ii) the type and degree of heterothallism, and (iii) the type of cell, or organ, taking part in conjugation. The types of reproduction occurring among the diatoms are reviewed by Ruth Patrick. The topic of sex in unicellular algae, by R. A. Lewin, relates chiefly to *Chlamydomonas,* includes discussions of physiological aspects of reproductive processes, and emphasizes the differences in experimental results obtained by Moewus and all other investigators. In the longest paper, and the only one extensively illustrated, D. H. Wenrich presents a comparative review of the reproduction cycles occurring among the natural groups of protozoa. Mating-type determination in *Paramecium aurelia* is discussed by D. L. Nanney in relation to the parts played by macronucleus, micro-nuclei, and cytoplasm. There is a rather extensive review by C. B. Metz of the physiology of fertilization in *Paramecium* and of the mating substances involved, with references to studies on other ciliates and a comparison with metazoan fertilization. The volume ends with comments by D. H. Wenrich on the origin and evolution of "sex," in which he discusses several postulated reasons why sexual reproduction is beneficial to organisms, omitting that which seems most important to geneticists, namely, that it constitutes the basis for the recombination of genetic traits possessed by individuals.

The audience for which this book is intended is not immediately apparent. While it gives a general survey of the diverse sexual mechanisms occurring among the microorganisms, the coverage is, in some respects, less thorough than in earlier compendiums on the same subject. New and exciting discoveries, not reviewed in older works, are limited principally to the implications of sexuality in viruses and bacteria and to details of the mating reactions in the ciliates.

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The Human Masticatory Apparatus. An introduction to dental anthropology. Meyer Klatsky and Robert L. Fisher. Dental Items of Interest Publ., Brooklyn; Henry Kimpton, London, 1953. xxi + 246 pp. Illus. $6.

Increasingly, dentistry is refuting bygone appellations such as "dental mechanic," "tooth carpenter," and the like. On the contrary, it is emergent as a science and as a healing art, closely integrated with related sciences (such as paleontology, both comparative and human, descriptive morphology, physical anthropology, and genetics) and with the sister healing art of medicine. Time-honored scientific and clinical fences have given way to common grazing grounds.

This volume is a record of the changing perspectives in dentistry, that is, that teeth are more than mere structure and that they have a functional aspect related to other bodily systems. This integrative perspective carries with it a time element, namely, that the

human dentition is best understood in terms of its evolutionary background. Hence, the book's first chapter is given over to "evolution and dental degeneration." Here are pointed organic origins and trend, with emphasis upon present involutionary trends, leading (by inference) to various kinds of structural and functional disuse atrophy.

Such a trend may be recognized today in two major fields: first, consolidation in racial dento-facial patterns; second, entrenchment in unit characters or trait-complexes, genetically speaking, in face and teeth. These fields are covered, although of necessity the racial data are simplified in the sense of bypassing moot or obscure points of detail.

For present consideration the authors stress the dynamics of functional integrity. The discussion of "diet and its effect upon the masticatory apparatus" is focused upon the problem that primitive diets—"rough, bulky, and resistant"—conduced to dental health and vigor, while modern diets—"refined texture of the food, and the sophisticated methods of its preparation and consumption"—lead to poor tissue and muscle tonus, incorrect tooth-bone relationship, and rotten teeth. It must be noted however, that claims of this nature are, in this book, stated rather than demonstrated or proved.

There are very useful genetic chapters on "The relation of genetics to dental science," on "dental anomalies," and on "the future of our third molar." Many traits of teeth and jaws are discussed in genetic terms. Perhaps the most far-reaching discussion is that of "dentistry as a public health service," for the authors feel that "the health and welfare of the human masticatory apparatus . . . is a public health problem which must be solved by united effort."

This book, I feel, is a useful contribution toward such a goal.

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Structure Reports for 1945–46. vol. 10. A. J. C. Wilson, Gen. Ed.; C. S. Barrett (Metals), J. M. Bijvoet (Inorganic compounds), and J. Monteath Robertson (Organic compounds), Section Eds. Utrecht: Oosthoek, 1953. (For the International Union of Crystallography.) 325 pp. Illus. $12.

This volume follows the pattern and maintains the standard of volumes 11 and 12. It is divided into three sections: "Metals," "Inorganic compounds," and "Organic compounds." In the introduction the general editor says:

> Structure Reports are not intended to be abstracts in the ordinary sense. Ideally they extract only material of structural interest . . . so completely that no further structural information would be gained by consulting the paper itself,

This aim has been achieved, in general, and, in some cases, critical comments added by the reporters as well as derivative information computed from the original data make the report even more useful than the original paper. The difficult problem of classification, particularly in the sections dealing with inorganic and organic compounds, has been neatly sidestepped by placing these substances roughly in order of increasing complexity and by providing excellent author, subject, and formula indexes.

The considerable number of papers which are reported from behind the Iron Curtain and from Japan make this invaluable to the crystallographer who is remote from the larger libraries and whose command of the Russian and Japanese languages is either very elementary or, more probably, nonexistent. The type is clear and the diagrams are excellent. Although the paper used is thick and of good color, it soils quickly with use. It seems a pity that a higher gloss paper was not selected for this publication that undoubtedly will be frequently consulted for many years to come.

Crystallographers and all others who are interested in the structures of elements and compounds, whether they are chemists, metallurgists, physicists, or natural scientists owe a considerable debt of gratitude to the International Union of Crystallography who conceived the plan for *Structure Reports* and to A. J. C. Wilson, his section editors, and reporters for the careful, exhaustive, and accurate execution of their task. When the gap between volume 10 and the last volume of *Strukturbericht* is finally closed there will be available, in a most convenient collection, an almost complete record of structural investigations from the birth of x-ray diffraction studies to the present time.

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New Books

Relativity for the Layman. A simplified account of the history, theory, and proofs of relativity. James A. Coleman. William-Frederick, New York, 1954. 131 pp. $2.75.

Laboratory Exercises on the Plant Kingdom. Paul C. Lemon and Norman H. Russell. Brown, Dubuque, Ia., 1954. 121 pp. $2.50.

The Chemistry of Petroleum Hydrocarbons. vol. I. Benjamin T. Brooks, Cecil E. Boord, Stewart S. Kurtz, Jr., and Louis Schmerling, Eds. Reinhold, New York 22, 1954. 664 pp. $18.

Concise Dictionary of American Grammar and Usage. Robert C. Whitford and James R. Foster, Eds. Philosophical Library, New York, 1955. 168 pp. $4.50.

Cancer: Race and Geography. Some etiological, environmental, ethnological, epidemiological, and statistical aspects in Caucasoids, Mongoloids, Negroids, and Mexicans. Paul E. Steiner. Williams & Wilkins, Baltimore, 1954. 363 pp. $5.

Charles Darwin and the Golden Rule. The late William Emerson Ritter. Edna Watson Bailey, Ed. Science Service, Washington; Storm, New York, 1954. 400 pp. $5.

Instrumental Methods of Chemical Analysis. Galen W. Ewing. McGraw-Hill, New York–London, 1954. 434 pp. $6.50.