extremes of environmental temperature, high altitude, nutritional deficiencies, strenuous work, participation in combat, etc. This undertaking is beyond one man's competence and capacity. At any rate, the summary attempted by Bartley and Chute does not fill the need for a comprehensive and up-to-date treatment.

The part devoted to fatigue as a subjective experience is also unsatisfactory, but for other reasons. The amount of valid and usable information available in the literature is small and there is, consequently, little to summarize. Bartley's own work in this area is very limited. The role of "conflict" in the causation of fatigue was developed in the course of his studies on the pupillary reflex (1942). Later (1943) conflict (and frustration), defined as "any clash, incompatibility or disharmony occurring at any level of organismic activity," was assigned a universal role in fatigue. Most of the discussion is based on arm-chair analysis.

The emphasis on the attitudes and motivation of persons in whom fatigue is being studied is wholesome. Few will disagree with the author's statement that the subjective phenomena of fatigue cannot be treated in a simple quantitative fashion. However, no constructive suggestions, useful to the experimenter or the clinician, such as using more sophisticated, standardized inventories, were submitted. Improved methods are a *sine qua non* condition of rising above the stage in which "most of what we know about fatigue arises from everyday observations and from deductions made from these" (p. 400).

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Scientific and industrial glass blowing and laboratory techniques. W. E. Barr and Victor J. Anhorn. Pittsburgh, Pa.: Instruments Publ., 1949. Pp. viii + 380. (Illustrated.) $6.00.

Three objectives are outlined and admirably attained in the 15 chapters of this book. The first objective is to give instruction in glass blowing, with many elementary details and drawings, covering a simple junction of two pieces of glass and ending with the making of a complicated ground glass stopcock. Shop layout, burner designs, the chemical and physical properties of glasses of American and imported types and other related topics help to broaden the reader's knowledge. A chapter on glass-to-metal seals covers the principles involved, the combinations of metals and glasses available, their properties, and the production of lamps and tubes with such seals.

The second objective is to present advanced techniques required for the production of high vacua. Two chapters describe many types of vacuum pumps and vacuum gages in great detail, including their calibration and uses. There is a chapter on high vacuum techniques which includes silvering methods, gas evolution from hot glass, and a host of other items.

The third objective is to describe in great detail four types of special glass equipment with the aid of other authorities, such as Joyner on gas adsorption apparatus, Hanson on molecular weight apparatus, Anderson on Swietoslawski ebulliometers. A long chapter is devoted to distillation problems, including theoretical discussion and operating requirements of fractionating and distillation columns and condensers. Vacuum fractionating equipment and molecular stills also are described.

Each chapter is concluded with adequate literature references, and the index refers to subject matter only. The book will appeal to people of varying interests, but the emphasis is mainly on chemical scientific apparatus and the title might well have indicated this. There will be differences of opinion on the details of construction, but not on the main points covered. With so much material there are bound to be errors, such as the Dushman reference on page 191, and the chemical composition of DG glass on page 124.

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The essentials of organic chemistry. C. W. Porter and T. D. Stewart. Boston, Mass. and London, Engl.: Ginn, 1948. Pp. vi + 394. (Illustrated.) $4.00.

Professors Porter and Stewart have provided a textbook for a short course in organic chemistry. They have covered most of the basic and established facts and theories of this branch of learning in a simple style that should be easily comprehensible to a beginning student. The book is designed primarily for nonscience majors. It is equipped with exercises and problems at the end of each chapter and with adequate diagrams, tables, and equations to illustrate the textual discussions.

It should have been possible for the authors to incorporate some of the more important and interesting new products, processes and theories without lengthening the book unduly. Such developments as the silicones, the oxo process, and the carbonium ion theory of rearrangements are either not mentioned or are inadequately treated. Statements such as the following are inaccurate or grossly misleading: "Animal parasites are called trypanosomes; examples are the hookworm, the amoeba which causes dysentery, . . ." (p. 361); "A reaction which is not given by aliphatic ketones, but which occurs readily with aromatic ketones, is the Clemmensen reduction" (p. 331); "The hydroxyl group of a phenol, however, may be replaced with chlorine by heating the phenol with phosphorus pentachloride" (p. 300). The last statement is not qualified in any way and creates the false impression that satisfactory yields are ordinarily obtained with all phenols.

Aside from this sort of inaccurate statement, however, the book is remarkably free from errors. It is well printed and bound and presents an attractive appearance. The authors have produced a work which should be popular in many colleges.

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