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SINCE the important contributions of Levvy and Kerr have been repeatedly discussed (*1–3*), this comment is merely intended to restate our attitude toward the concept of β-glucuronidase as a catalyst of the synthesis of glucuronides and to clarify—if it is possible—the prevailing viewpoints on glucuronide synthesis.

With regard to the first consideration, although direct proof that the enzyme catalyzes the conjugation of glucuronic acid *in vivo* is lacking, this mechanism is at least theoretically possible and there are good reasons for its existence (*1–3*). This concept became the basis of a working hypothesis proposed in 1940 (*4*) in an attempt to explain certain glucuronidase phenomena in animals, and it has been helpful in suggesting new experiments and has led to the discovery of new information. It will remain a useful *ad hoc* hypothesis until it has outlived its value for our purposes, or until future work suggests a better explanation of the role of the enzyme.

It is Levvy's implied contention that certain of his *in vitro* data negate the validity of the working hypothesis which we favor. It should be pointed out, however, that the translation of *in vitro* data into valid deductions *in vivo* is always hazardous even with the use of surviving tissues, unless the *in vitro* findings do coincide with observations in the whole animal. In our view, the findings in the whole animal are more readily explained on the basis of a predominately synthetic action of β-glucuronidase. The weight that one wishes to attach to negative *in vitro* results is a matter of personal opinion.

With respect to the second consideration, two mechanisms for glucuronide synthesis have received attention. The first entails the synthesis of glucuronides from three carbon precursors without the participation of glucuronic acid itself. A requirement of oxidation and phosphorylation is stated by Lipschitz and Bueding (*5*), Karunairatnam *et al.* (*6*), and Storey (*7*). One suspects that the processes of oxidation and phosphorylation concern the synthesis of glucuronic acid only and not its conjugation. The other concept holds that glucuronic acid itself is the immediate conjugating compound and that the enzyme β-glucuronidase participates in the conjugation (*4*).

This second mechanism is supported in part by direct experimental evidence in the intact animal. Thus, King (*8*) and Packham and Butler (*9*), using radioactive carbon, have shown that the synthesis of borneol glucuronide in the guinea pig and of naphthyl glucuronide in the rat takes place with the preformed molecule of glucuronic acid. Glucuronic acid, administered intraperitoneally, was incorporated into biosynthetic naphthyl glucuronide (*9*) at twenty times the rate of any three carbon precursors.

This observation does not rule out the possibility that there may be other mechanisms of glucuronide synthesis not requiring preformed glucuronic acid, nor does it necessarily prove that β-glucuronidase catalyzes the conjugation. It does lend added support to the working hypothesis discussed here.

It is hoped that the exposition of these varying viewpoints concerning a biologically important phenomenon may benefit other investigators who may undertake work in this field.

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Book Reviews

Probit Analysis: A Statistical Treatment of the Sigmoid Response Curve. 2nd ed. D. J. Finney. New York–London: Cambridge Univ. Press, 1952. 318 pp. $7.00.

The first edition (reviewed in SCIENCE, **107**, 76, [1948]) has proved very useful and was sold out some time ago. The second edition is nearly the same in content, but somewhat extended, with better paper and printing. The jacket and preface list the new material and the sections that have been changed.

The section on alternative distributions has been broadened, and discusses use of the angle transformation. The sections on maximum likelihood estimates, on the Parker-Rhodes equations, and on probits for quantitative response are revised to use a simplification of equations recently obtained by the author himself.

A new chapter has been added. It is not unified as

are the others, but discusses several recent developments in the field. It includes alternatives to maximum likelihood, situations where the population treated is estimated rather than known, experimental designs, independent action in mixtures, special methods for estimating high percentage points, and interpretation of standard errors.

The appendix on derivations has been considerably rearranged, and two new tables are added—on weighting with estimated populations, and on analysis of inverse sampling. The bibliography is extended. The book will continue to be almost indispensable in dosage-mortality studies.

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Wavelength Tables of Sensitive Lines. L. H. Ahrens. Cambridge, Mass.: Addison-Wesley, 1951. 86 pp. $3.00.

These tables are of great value for the analyst dealing with the spectrographic d-c arc analysis of compound materials such as rocks, soils, and minerals. The main table contains the wavelengths of the most sensitive lines of 68 elements and information about relative intensities and sensitivities, and excitation potentials. The most valuable feature of the book is the listing of all possible interfering lines of other elements occurring in the neighborhood of each sensitive line within the range of about ± 0.5 A. Usually only three or four sensitive lines are listed—a sufficient number for an unambiguous identification. A smaller separate table lists the most sensitive lines of the rare earth elements and gives the values of the relative sensitivities as determined by Meggers and Scribner, and Smith and Wiggins.

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Proceedings of the Second Clinical ACTH Conference*; Vol. 1: *Research*; Vol. 2: *Therapeutics. John R. Mote, Ed. New York: Blakiston, 1951. Vol. 1: 531 pp.; Vol. 2: 716 pp. $8.50 each.

The rapid advances in medical science in recent years and the great increase in research have strained existing media for publication. Prompt announcement of significant discoveries, so important to continuing progress, is possible with relatively few journals, and it has become customary to read lay accounts months before the appearance of the scientific publication. The printing in book form of the proceedings of informal conferences has been tried as a partial solution to this difficulty. The careful correction and editing of such transactions is time-consuming, and often the better part of a year, or even longer, is required to produce the volume. On rare occasions, the printed transactions are ready for the reader as early as four months after the conference, and such was the case in this instance.

The two volumes comprise a record of a meeting held under the auspices of Armour and Company. The editor's introduction and the complete table of contents appear in each volume. The 102 contributions—41 in Volume I and 53 in Volume II—are by 312 authors; they cover a wide field, and nearly all branches of medicine are represented. The influence of corticotropin (ACTH) on various phases of metabolism and the effects of the hormone on a great variety of disease processes are the subjects of most of the papers. The communications largely represent new material destined for later publication in various journals. Most of the papers are followed by discussions, a total of 177 individuals thus participating, some as many as ten times. The contributions vary widely in quality and significance: some are products of precise and careful investigation; some recount large and others small series of observations; sometimes the conclusions are conservatively drawn, and at other times they reflect the enthusiasm of the investigators. Therapeutic effects might be graded as definite, slight, and negative by one observer, whereas the corresponding responses might be classed as dramatic, moderately dramatic, and disappointing by another.

The two volumes contain a wealth of detail on the physiological and clinical effects of the hormone newly introduced into therapeutics. Probably in no other single publication could one acquire information on so many aspects of the subject, and it is unfortunate that no index is provided. Without it the work does not serve well as a source of reference; although the table of contents lists the titles of the papers, there is no way of finding material within the extensive discussions. As there are some 357 separate items of discussion, some of them as long as or longer than the papers being discussed, and as these of necessity usually appear in their order of presentation at the conference regardless of subject matter, the reader has no way of finding what he seeks short of leafing through 1247 pages.

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Scientific Book Register

Seaweeds and Their Uses. V. J. Chapman. New York–London: Pitman, 1952. 287 pp. Illus. $6.00.

Theory of Matrices. Sam Perlis. Cambridge, Mass.: Addison-Wesley, 1952. 237 pp. $5.50.

Ultraviolet Radiation. Lewis R. Koller. New York: Wiley; London: Chapman & Hall, 1952. 270 pp. $6.50.

A Hundred Years of Biology. Ben Dawes. London: Duckworth; New York: Macmillan, 1952. 429 pp. $5.00.

Solubilities of Inorganic and Organic Compounds: A Compilation of Solubility Data from the Periodical Literature. Supplement to 3rd ed. containing data published during 1939–49, inclusive. Atherton Seidell and William F. Linke. New York: Van Nostrand, 1952. 1254 pp. $12.50.

The Theory of Relativity. C. Møller. New York: Oxford Univ. Press, 1952. 386 pp. $7.00.

Flour for Man's Bread: A History of Milling. John Storck and Walter Dorwin Teague. Minneapolis: Univ. Minnesota Press, 1952. 382 pp. Illus. $7.50.