Proceedings of the Thirty-third Annual Meeting, Highway Research Board. Fred Burggraf and Walter J. Miller, Eds. National Academy of Sciences–National Research Council, Publ. 324, Washington, 1954. xvii + 563 pp. Illus. $8.

This book contains the proceedings of a 4-day conference of the highway technologists of America conducted by the Highway Research Board. The board was organized 11 Nov. 1920 to encourage research and to provide a national clearing house and correlation service for research activities and information on highway administration and technology.

In this volume are 43 of the original 122 research papers and committee reports presented at the annual meeting. Publication reference is given for those papers not in the *Proceedings*. The papers are listed under six major departments covering the entire highway field. These are (i) economics, finance, and administration; (ii) highway design; (iii) materials and construction; (iv) maintenance; (v) traffic and operations; and (vi) soils.

To the highway industry this book represents an important addition to its growing body of scientific knowledge. It is a must for the student of highway engineering and for the practical man who must apply the results of scientific study to highways or other fields with similar problems.

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Probleme und Beispiele biologischer Regelung. R. Wagner. Georg Thieme, Stuttgart, 1954. v + 219 pp. Illus. DM 29.40 (U.S. distrib., Intercontinental Medical Book, New York.)

Einfuhrung in die biologische Registriertechnik. Herbert Klensch. Georg Thieme, Stuttgart, 1954. x + 222 pp. Illus. DM 33. (U.S. distrib., Intercontinental Medical Book, New York.)

Wagner applies to certain problems of neurophysiology and circulation the point of view of the engineer who is interested in control mechanisms involving feedback. There is little new factual material in this book. Wagner's own experiments, published in 1925, in which he analyzed through action potentials voluntary movements that were performed against friction, inertia, and elastic forces, form the core of the first part. The regulation of the blood pressure through sinoaortic mechanisms and the role of heart reflexes (v. Bezold-Jarisch) are the chief topics of the second part.

The aim of this study, however, was not to reveal new facts but to gain insight into the principal features of regulatory mechanisms that apparently have little in common. In this, the author succeeds in a searching and often brilliant analysis. He shows the significance of the tendon receptors for the regulation of muscle tension and the importance of the muscle spindles for the regulation of height and speed of voluntary contractions. He points out the analogous role of sinoaortic receptors responding to tension and to receptors in the heart responding to stretch for the regulation of blood pressure and the minute volume of the heart, respectively. Central variations in the blood pressure, pupillary reflexes, and other phenomena are analyzed from the same point of view. The book is recommended to anyone interested in an organismically oriented physiology.

Klensch's book gives a well-written and abundantly illustrated introduction to the various laboratory procedures used in current physiological research. It will be useful to others besides the beginner, since it contains a detailed bibliography. The latter, however, is largely restricted to the German literature.

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The Why of Chemistry Problems. Fred B. Eiseman, Jr. Educational Publ., St. Louis, 1954. iv + 303 pp. Illus. $4.50.

In the words of the author: "It is felt that, by working a mathematical problem that requires an exact numerical answer, the student will gain his insight into the principles of chemistry that underlie and are the basis of the solution to the problem. . . . A knowledge of the laws and principles can be acquired by simply memorizing them. However, it should be obvious that meaning, and therefore, understanding, can only accrue to these laws if their application and use can be pointed out, and if the student is required actually to use them in some practical situation." One may acquire the theory of chemistry by reading, but the art of laboratory synthesis and the solution of chemical problems must be acquired by individual performance involving the use of both the mind and the hands.

Subjects included in the various chapters include: how to solve problems; the metric system; significant figures; conservation of mass and energy; atomic weights; gram atomic weights; molecular weights; writing formulas; percentage composition; simplest formula, true formula; balancing equations; weight-weight problems; short-cut in weight-weight problems; excess reactant; the gas laws, use of the gas laws in practical situations; gram molecular volume and specific gravity and density; true formula by using the gram molecular volume; weight-volume problems, vapor density of gases and density and specific gravity of solids and liquids; volume-volume problem; Raoult's law and molality; molarity; equivalent weight; normality; titration problems; equivalent weight and excess reactant; electrochemical equivalent; advanced problems in ionization; problems dealing with specific elements; and writing equations for specific elements.

Each chapter concludes with a set of problems. It is obvious that this book is designed to cover the problem area for any introductory textbook in chemistry; it should serve the objective well, particularly for students who have difficulty with chemistry problems.

The book is recommended for the careful consideration of teachers of introductory chemistry.

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Chemical Pathways of Metabolism. vol. I. David M. Greenberg, Ed. Academic Press, New York, 1954. xi + 460 pp. Illus. $11.

This publication probably serves a useful purpose in assembling a great deal of information about the components and mechanisms of the enzymatically catalyzed reactions that comprise the main chemical pathways of metabolism. Volume I consists of eight independent reviews by 10 well-known authors.

Chapter 1, "Free energy and metabolism," illustrates some biochemical applications of the principles that relate free energies and chemical equilibria. Such fundamental material is properly placed at the beginning of a work of this kind, but, perhaps in a revised edition, theoretical principles should be more systematically developed for the benefit of those who lack adequate preparation, or this preparation should be taken for granted so as to permit a more exhaustive review of recent developments in biochemical thermodynamics.

Chapter 2 presents a characteristically stimulating description of the concerted action, effectively implemented in some instances by structural organization, of "Enzymes in metabolic sequences." Chapter 4 skillfully marshals the crucial evidence supporting the most general and important of these reaction sequences, the final common metabolic pathway best known as the "Krebs' cycle."

Of the remaining chapters, three dis-