been obtained. We learn that he considered a slide rule a device for wasting time, and he apparently never used one. On the other hand, there are various citations of profound wisdom and understanding. To a student who complained how uphill research was, he replied: "Yes, that is why there is so much credit in doing anything." We find him deploring the fact that research students of to-day require so much. "They expect," he said, "to be given a properly designed piece of apparatus which will *work*. In the earlier days we had to make it work ourselves as best we could, whatever its natural deficiencies might be." We find him dilating upon the position of industrial research and upon the dangers of fundamental research being done under conditions in which the researcher is paid for his efforts. He ends by stating: "You want this kind of research, but if you pay a man to do it, it will drive him to research of a different kind. The only thing to do is to pay him for doing something else and give him enough leisure to do research for the love of it."

J. J., while a radical in the physics of mid-Victorian times, was very conservative in his own radicalness, and was never happy with even the older quantum theory, apart from the new. We find him quoted as saying in a letter: "Again, I differ from you about the value of the conception of an ether, the more I think of it the more I value it. I regard the ether as the working system of the universe. I think all mass, momentum and energy are seated there, . . ." It would have been perhaps interesting if the book had included some reference to Niels Bohr's association with the Cavendish Laboratory.

Like many of the famous physicists of the nineteenth and early twentieth centuries, J. J. was for a time interested in psychical investigations and is even sufficiently sympathetic towards the phenomenon of water divining to remark that there is no doubt of the reality of the process of "dowsing."

The period of transition between Thomson's resignation of the directorship of the Cavendish Laboratory and the appointment of Rutherford is one which must have been fraught with many delicate considerations. Thomson, having retired from the directorship of the Cavendish Laboratory, had assumed an independent professorship, and the ironing out of responsibilities between a new director as forceful in personality as Rutherford and a retired director as eminent as J. J., and who was still active in the laboratory, must evidently have necessitated rather difficult diplomatic adjustments. Thomson was very evidently anxious to have Rutherford accept the directorship, and his own characteristic modesty is well exemplified by his remarking, in connection with the potentialities which the post afforded, that: "There are very great opportunities for making a very great school of physics at Cambridge. . . ." As the author remarks, Thomson, in this phase, "does not give the slightest hint of what was obviously the fact, that he himself *had* made a very great school of physics at Cambridge, and that the problem for his successor was to maintain it."

It will come as a surprise to many that in spite of the relatively small emoluments pertaining to even such a distinguished man of science, emoluments which do not appear to have been supplemented from such extraneous sources as patents or independent professional activities, J. J. Thomson's will was ultimately proved for no less a sum than 82,000 pounds sterling, which Lord Rayleigh attributes to a skill in investments which would have caused him to have attained distinction in the business world of affairs if he had chosen that line instead of science.

The author stresses everywhere the fact of J. J.'s informality, simplicity and the lovableness of his disposition. We see a man whose great influence on science has come as much through the permeation of his great spirit into the souls of those who surrounded him as by his own researches and formal writings. In reading the book one is conscious, in the reverence and love which the writer shows for his great master, of the absorption within himself of something of that spirit.

W. F. G. SWANN

ORGANIC CHEMISTRY

Textbook of Organic Chemistry. By GEORGE HOLMES RICHTER. Second edition. 6¼ × 9¼ in. 759 pp. Artistically bound in gray and blue cloth. New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd. 1943. $4.00.

THE new edition of this excellent text, in its very attractive blue and gray binding, will be warmly welcomed by all who have used or are familiar with its predecessor, which appeared just five years ago.

The changes made in the older edition consist mainly in the rearrangement of old and the addition of new subject-matter. Thus, the discussion of natural products, previously scattered through various chapters, has been assembled in a single chapter and a new section on terpenes added. Many other similar illustrations might be cited. As to new matter, supplementary information has been provided concerning hormones, vitamins, drugs, plastics (including synthetic rubbers), hydrocarbons, gasoline, octane ratings of fuels and halogenation; as well as resonance, tautomerism, the reactions of Claisen, Elbs, Scholl and Stephen; and the rearrangements of Demjanow, Jacobsen and Wagner.

The book is warmly recommended as one of the best in its class.

The Chemistry of the Aliphatic Orthoesters. By HOWARD W. POST. American Chemical Society, Monograph Series, No. 92. $6\frac{1}{4} \times 9\frac{1}{4}$ in. 188 pp. Bound in dark blue cloth. New York: Reinhold Publishing Corporation. 1943. $4.00.

THE volume comprises the following chapters: 1. Introduction; 2. Preparation and General Properties; 3. Reactions with or Catalyzed by Inorganic Acidic Substances; 4. Reactions with Organic Acids, Anhydrides and Halides; 5. Reactions with Nitrogen Compounds; 6. Reactions with Organo-metallic Compounds; 7. Carbohydrate Orthoesters and Orthoacids; 8. Miscellaneous Reactions; 9. Silicoörthoesters: Preparation and Physical Properties; 10. Chemical Properties of Silicoörthoesters; 11. Polyalkoxides of Other Elements of the Fourth Column; and 12. Physical Properties of Orthoesters. An author index and a subject index conclude the work. Numerous tables are distributed throughout the text, and every chapter, except the first one, concludes with an extensive bibliography.

The book is a comprehensive and scholarly compilation and presentation of information widely scattered in chemical literature, and not heretofore brought together in a single volume so far as the reviewer is aware. Our present knowledge of the esters of orthoformic acid, $HC(OR)_3$, of its homologs and of orthocarbonic acid, $C(OR)_4$, has been painstakingly gathered, classified and reviewed. Two chapters are devoted to the silicon analogs of these esters; and one to the polyalkoxides of other elements of the fourth column of the Periodic Table; *viz.* Ti, Ge, Zr, Sn and Pb.

The subject-matter is classified primarily according to the preparation method or type of reaction involved, rather than on the basis of the compounds discussed, and secondarily in chronological sequence.

The author calls attention to the remarkable agreement between the b.p. of a given orthoester and that of its silicon analog, to the stability of the carbon-silicon bond in such compounds and to the fact that silicoörthoesters are subject to hydrolysis in much the same manner as the corresponding carbon compounds.

A valuable and stimulating feature of the book is the attention called to problems in this field which still await solution. The final chapter, on the physical properties of orthoesters, consists of a list of known orthoesters, arranged according to molecular formulas on the Richter-Stelzner Lexikon plan, recording all known physical data, and with a bibliography of 391 titles.

In its chosen field, the volume is in a class by itself and is certainly indispensable to all interested in any way in the chemistry of the aliphatic orthoesters.

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SOCIETIES AND MEETINGS

THE VIRGINIA ACADEMY OF SCIENCE

THE twenty-first annual meeting of the Virginia Academy of Science was held in Richmond on May 12 and 13. It was held in the middle of the week to avoid week-end congestion and in Richmond as an easily accessible place. It was foreseen that it could not be a full-sized, regular meeting and yet 204 registered out of a membership of 800, and seven of the ten sections put on programs.

A group interested in starting a section on statistical methods presented a qualifying program of ten papers.

Three committees were appointed: A committee to function as the Virginia part of the larger committee of the Southern Association of Science and Industry, which is making a survey of the natural resources of the South. A committee to prepare data concerning the natural resources of Virginia for the use and instruction of the school children of the state. A committee appointed, upon invitation of the Virginia Commission of Game and Inland Fisheries, to cooperate with state agencies concerned with conservation.

A special address was delivered on Wednesday night on the "Demographic, Economic, and Social Characteristics of the James River Basin" by Drs. Lorin A. Thompson and Joseph B. Gittler, of the Virginia State Planning Board.

The Virginia Academy of Science Award of $50 was given to Dr. J. B. Myers, of the Blandy Experimental Farm of the University of Virginia, for a paper entitled "Cytogenetics of Phlox," and the Jefferson Prize of $50 was given to Mr. Walter H. Hough, of the Virginia Agricultural Experiment Station at Winchester, Va., for a paper entitled "Development of Vigorous or Resistant Strains of the Codling Moth."

The crowning event occurred at the academy luncheon on Wednesday, when 125 were present. Friends of the academy had offered to contribute $200 a year to the work of the research committee, provided the academy would contribute an additional $400. When this was announced, pledges came in so rapidly that more than the required amount was raised in less than five minutes. No record was made of these oral pledges, but $639 has come in and has been deposited in the bank. This will about double the amount of