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

money the research committee will have available each year for the encouragement of research in Virginia.

The officers elected were the following: Major W. Catesby Jones, *President;* Dr. Robert F. Smart, *President-Elect;* Dr. E. C. L. Miller, *Secretary-Treasurer;* Dr. Sidney S. Negus, *Assistant Secretary.*

E. C. L. MILLER,
Secretary

SPECIAL ARTICLES

ISOLATION AND CHARACTERIZATION OF INFLUENZA VIRUS B (LEE STRAIN)[1]

THE influenza virus A (PR8 strain) has been isolated from virus-infected chick embryo chorio-allantoic fluid in preparations of high homogeneity with respect to particle kind.[2] The particles, which behaved as the virus and which consisted of a lipoprotein complex containing nucleic acid of the desoxypentose type, were revealed in the electron microscope as ovoid or kidney-shaped images of variable size corresponding to particles of 77.6 mμ average diameter. Sedimentation velocity diagrams showed a single slightly diffuse boundary. The sedimentation constant was $S_{20°} = 724 \times 10^{-13}$, which with the assumption of a spherical shape for the particles and a density of 1.2,[3] gave a value of 80 mμ for the particle diameter. In the present paper are described briefly the results of similar studies of the Lee strain of the influenza virus B.

The influenza virus B was cultivated in the chorio-allantoic sac of 11-day-old chick embryos. After 42 to 48 hours' incubation at 37° C. following inoculation with the virus, the chorio-allantoic fluid was drawn off, cleared of aggregates by angle centrifugation, dialyzed 24 hours at 2–5° C. against flowing Ringer-calcium chloride solution,[2] and cleared again by angle centrifugation. The fluid was adsorbed twice with adult chicken red blood cells from which the virus was eluted in one fourth the original volume for 2.5 hours at room temperature (24 to 28° C.). The eluate was twice adsorbed in like manner and elution carried out as before. The second eluate was then ultracentrifuged at 27,000 g for one hour, and the resulting pellets were dissolved at 150 times concentration with respect to volume. The pellet suspension was spun at 11,000 g for 2 minutes to remove aggregated material.

In this process, practically all the red blood cell agglutinating capacity and the infectious properties of the chorio-allantoic fluid were carried into the second eluate. Ultracentrifugation of the eluate at 27,000 g for 1 hour resulted in sedimentation of about 90 per cent. of these biological characters. The low-speed centrifugation at 11,000 g was associated with a further small loss of the red blood cell agglutinating capacity and infectivity, leaving about 40 to 70 per cent. of these properties in the clarified concentrates. The concentrates reacted specifically in complement fixation and precipitation reactions with the sera of ferrets and rabbits immunized with mouse lung infected with this strain of the virus.

Electron micrographs of the purified virus concentrates showed rounded or ovoid images of variable size indicating an average particle diameter of 98 mμ. Exceedingly little extraneous material was present. Definite differentiation of structure within the individual particles was indicated by an approximately centrally placed area of relatively high density. The chorio-allantoic fluid and the inactive fractions—the supernate after adsorption with red blood cells and the supernate of ultracentrifugation—contained large numbers of amorphous particles of all sizes, but many especially of about 40 mμ to approximately the size of the virus particle. Particles of this range of diameter were not seen in chorio-allantoic fluid from normal embryos or in the fluid or comparable fractions of it from embryos infected with influenza virus A.[2]

Sedimentation velocity diagrams showed a single slightly diffuse boundary corresponding to a sedimentation constant of $S_{20°} = 832 \times 10^{-13}$. From the sedimentation constant and the specific volume, 0.865, determined by pyknometer measurement, assuming a spherical shape, the calculated particle diameter was 100 mμ.

Suspensions of the concentrated material were opalescent and bluish. Positive biuret, ninhydrin and Millon tests were obtained. The glyoxylic acid and Molisch tests were negative. A positive reaction was seen in Bial's reagent after hydrolysis of the material with 10 per cent. sulfuric acid. This and a weakly positive Dische diphenylamine reaction indicate the presence of desoxypentose. The nitrogen content of the material dehydrated over P_2O_5 varied from 9.6 to 10.4 per cent.

[1] This work was aided by the Dorothy Beard Research Fund and by a grant to Duke University from Lederle Laboratories, Inc., Pearl River, N. Y. The investigation was also supported through the Commission on Acute Respiratory Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, U. S. Army, and by grants from the Commonwealth Fund, the W. K. Kellogg Foundation, the John and Mary R. Markle Foundation and the International Health Division of the Rockefeller Foundation to the Board for the Investigation and Control of Influenza and Other Epidemic Diseases for the Commission on Acute Respiratory Diseases.

[2] A. R. Taylor, D. G. Sharp, D. Beard, J. W. Beard, J. H. Dingle and A. E. Feller, *Jour. Immunol.*, in press.

[3] W. J. Elford and C. H. Andrewes, *Brit. Jour. Exp. Path.*, 17: 422, 1936.