



are based on the stereostructure III and its mirror image.

Dihydrohaemanthamine<sup>3</sup> (V, R = OH), was treated with thionyl chloride for one hour at 78°. The excess reagent was removed and the residue was refluxed with an excess of lithium aluminum hydride in tetrahydrofuran for 5 hours. The reaction product, desoxydihydrohaemanthamine, isolated in 52% yield, was identical in melting point (95–97°) and infrared spectrum (KBr) with dihydrobuphanisine (V, R = H).<sup>5</sup> A mixture

(5) H. M. Fales and W. C. Wildman, *THIS JOURNAL*, **80**, 4395 (1958).

melting point determination was depressed below 70°. The optical rotatory dispersion curves (330–700 m $\mu$ ) in chloroform of the product ( $[\alpha]^{25}_D +28^\circ$ ) and dihydrobuphanisine ( $[\alpha]^{25}_D -28^\circ$ ) revealed that the two substances were optical antipodes.

This transformation identifies the alkaloids hydroxylated in the 5-membered D ring (haemanthamine, haemanthidine, crinamine<sup>3</sup> and haemultine<sup>6</sup>) with the (+)-crinine nucleus (III) while the alkaloids not hydroxylated in this position, crinine, powelline, buphanidrine, buphanisine, undulatine, and buphanamine, have been shown to contain the enantiomorphic (–)-crinine nucleus.<sup>5,7,8,9</sup> Finally, it seems likely that pharmacological differences between the alkaloids of this nucleus stem from the absolute configurations of the bases rather than the stereochemical differences associated with the fusion of the octahydroindole ring.

(6) H.-G. Boit and W. Döpke, *Chem. Ber.*, **91**, 1965 (1958).

(7) E. W. Warnhoff and W. C. Wildman, *Chemistry & Industry*, 1293 (1958).

(8) W. C. Wildman, *THIS JOURNAL*, **80**, 2567 (1958).

(9) These observations should not be interpreted as a general rule, since the occurrence of vittatine, the optical antipode of crinine, has been reported.<sup>10</sup>

(10) H.-G. Boit and H. Ehmke, *Chem. Ber.*, **90**, 369 (1957).

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## BOOK REVIEWS

**Biochemical Preparations.** Volume 5. DAVID SHEMIN, Editor-in-Chief. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1957. ix + 115 pp. 15.5 × 23.5 cm. Price, \$4.75.

This volume, the fifth in the series, gives comprehensive procedures for the synthesis or isolation of over thirty substances of special interest to biochemists. The excellent style and format, resembling the "Organic Syntheses" series established in previous volumes, are maintained. The utility of the volume is increased by the inclusion of a cumulative subject index, a reference list of compounds of biochemical interest which have appeared in "Organic Syntheses" (through volume 37), a section on the properties and purity of each product and cross references given in the description of each preparation. The reliability and feasibility of each procedure submitted has been checked by an independent expert, whose comments appear as separate notes. The fifth volume of the series is another notable achievement of the objectives of the series as stated in the preface of the first volume: "to provide authoritative, thoroughly checked preparations for substances used in biochemical research and to provide preparations illustrating manipulative techniques and methods that may be useful both to research workers and to students."

A list of the contents of volume five follows: dibenzyl phosphorochloridate, phosphatidyl ethanolamine, sodium phosphocreatine, aldolase, crystalline condensing enzyme, S-succinyl coenzyme A, cytochrome c (addendum) and reduced cytochrome c, separations of nucleotides of ribonucleic acid, separation of 5'-deoxyribonucleotides, nicotinamide mononucleotide (NMN), S-adenosylmethionine (AMe), adenine-8-C<sup>14</sup>, D-glyceric acid 2-phosphate (trisodium salt), 2-deoxy-D-ribose, L-glutamine and D-glutamine, S-benzyl-DL-

homocysteine, S-benzyl-L-homocysteine, and S-benzyl-D-homocysteine, homocystine and homocystine, cyanomethylimidazole and imidazoleacetic acid hydrochloride, formiminoglycine, formimino-L-aspartic acid, formimino-L-glutamic acid.

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**Encyclopedia of Chemical Reactions.** Volume VII. Strontium, Sulfur, Tantalum, Technetium, Tellurium, Terbium, Thallium, Thorium, Thulium, Tin and Titanium. Compiled by C. A. JACOBSON, Late Professor of Chemistry, West Virginia University. Edited by CLIFFORD A. HAMPEL, Manager, Chemical Equipment Division, Fansteel Metallurgical Corporation, Editor, "Rare Metals Handbook." Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1958. 479 pp. 16 × 23.5 cm. Price, \$12.75.

This seventh volume of the "Encyclopedia of Chemical Reactions" retains essentially the features of its predecessors. The early literature on a large variety of reactions is well covered; the indexes are remarkably complete; the book is printed and bound in a readable and attractive style. That some effort has been made to counter criticisms of earlier volumes is evidenced by the appearance of references as recent as 1957.

A number of the elements included in this volume have been studied intensively during the past fifteen years, and it is unfortunate that more of this new chemistry has not been included. Hydride reactions are omitted almost com-