Allyl Cocaine Bromide—The reaction mixture, containing 3.0 g. (0.01 mole) of cocaine, 24.2 g. (0.20 mole) of allyl bromide, 10 ml. of dimethylformamide, and several pieces of copper wire, was sealed in a 50-ml. flask and stirred by a magnetic bar for a period of 3 days. The product was isolated by filtration and crystallized from ethanol–ether; white monoclinic prisms, m.p. 128–129°, in a yield of 3.2 g. (76%). Its IR spectrum exhibited carbonyl peaks at 1,705 and 1,727 cm.$^{-1}$ and lacked the presence of a strong shoulder from 3,000–2,500 cm.$^{-1}$. The NMR spectrum was identical to that of the methyl quaternary with the exception of new multiplets at 5.74 p.p.m. (3 H, $CH{=}CH_2$) and a singlet at 2.83 p.p.m. (2 H, N^+CH_2—) in place of the singlet at 3.20 p.p.m. (3 H, N^+CH_3).

Anal.—Calcd. for $C_{20}H_{26}BrNO_4$: C, 56.60; H, 6.13; N, 3.30. Found: C, 56.27; H, 6.38; N, 3.40.

***n*-Propyl Cocaine Iodide**—A solution of cocaine and *n*-propyl iodide (1:10) was allowed to stand in a closed flask for 5 weeks. The reaction product was collected on a filter, washed with ether, and crystallized from ethanol–ether yielding fine white crystals, m.p. 155–156°, in a yield of 0.8 g. (17%). The IR spectrum was nearly identical to that of the methyl quaternary except in the fingerprint region. The NMR spectrum was identical to that of the methyl quaternary except for aliphatic absorption at 3.13 p.p.m. (2 H, N^+CH_2—), a multiplet at 1.21 p.p.m. (2 H), and a triplet at 0.59 (3 H, CH_3).

Anal.—Calcd. for $C_{20}H_{28}INO$: C, 50.77; H, 5.92; N, 2.96. Found: C, 50.87; H, 5.76; N, 2.95.

Cocaine Hydrobromide—The reaction as described (3) was conducted. A solution of 3.0 g. (0.01 mole) of cocaine and 6.0 g. (0.05 mole) of allyl bromide in 30 ml. of benzene was heated at reflux with stirring under a nitrogen atmosphere for a period of 5 hr. The resulting precipitate was collected on a filter and crystallized from ethanol–ether. A yield of 3.1 g. (82%) of white crystals was obtained, m.p. 185–186°. (Lit. value, 186–187°). The IR spectrum exhibited a characteristic broad shoulder at 3,000–2,500 cm.$^{-1}$ (N^+H) plus the double carbonyl peaks at 1,732 and 1,705 cm.$^{-1}$. Its NMR spectrum revealed the aromatic protons as a multiplet at 7.65 p.p.m. (5 H), a multiplet of 5.50 p.p.m. (1 H), a singlet at 4.58 p.p.m. (1 H, HOD), a broad band at 4.20 (2 H, bridgehead), a singlet at 3.66 (3 H, OCH_3), a multiplet at 3.56 p.p.m. (1 H), a triplet at 2.93 p.p.m. (3 H, N^+CH_3), and a multiplet at 2.33 p.p.m. (6 H, cycloaliphatic). Treatment of the product with saturated sodium bicarbonate solution led to the isolation of long, white needles of cocaine as the free base, m.p. 96°. A mixture melting point with an authentic sample of cocaine hydrobromide showed no depression, m.p. 185–186°.

Anal.—Calcd. for $C_{17}H_{22}BrNO_4$: C, 53.13; H, 5.73; N, 3.65. Found: C, 53.27; H, 5.86; N, 3.64.

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Cocaine derivatives, quaternary—synthesis
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Books

REVIEWS

Microbial Transformation of Steroids and Alkaloids. By HIROSHI ILZUKA and ATSHUSHI NAITO. University of Tokyo Press, Tokyo, Japan, 1967. U. S. Agent: University Park Press, State College, Pa. xi + 294 pp. 18.5 × 26 cm. Price $16.50.

One approach to appraise the value of this book is to compare its contents to the two other books covering the same material ("Microbial Transformations of Steroids," by A. Capek *et al.*, Academic Press, New York, 1965, and "Microbial Transformations of Steroids," a handbook, by W. Charney and H. L. Herzog, Academic Press, New York, 1967).

This monograph by Drs. Ilzuka and Naito is useful as a reference source for individuals who would like to find quickly the references to accomplish a certain microbial reaction on steroids and a few alkaloids. It is indexed according to the type of microbial reaction, name of microorganism, type of substances (substrates and products), and authors.

While being well organized, it has the serious drawback of an incomplete listing of references. Furthermore, there is no information on biochemical mechanisms of microbial reactions.

The book by Capek *et al.* is fairly complete through 1965, relative to references and is similarly indexed. In addition, it covers such useful topics as mechanisms of transformations, practical methods of fermentation, isolation and identification procedures, chromatography, *etc.*, which are especially useful to someone who may have had no personal experience in performing a microbiological transformation. The third book of Charney and Herzog exhaustively examines both the entire scientific and U. S. patent literature through 1967. Furthermore, it also gives an excellent description of the up-to-date mechanisms of the various classes of microbial transformations, while omitting the practical aspects such as care of cultures, fermentation procedures, and separation of products. Without question, this handbook is most useful to those actively engaged in research in this field.

Taking all things into consideration, we rate: 1, Charney and Herzog ($21.00); 2, Capek *et al.* ($6.25); and 3, Ilzuka and Naito ($16.50).

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Principles of Adsorption Chromatography: The Separation of Nonionic Organic Compounds. By LLOYD R. SNYDER. Marcel Dekker, Inc., 95 Madison Avenue, New York, NY 10016, 1968. xvi + 413 pp. 16 × 23 cm. Price $17.50.

This represents Volume 3 in a new series of monographs on Chromatographic Science edited by Giddings and Keller. As the author states, the adsorption process is complex and difficult to understand. The author has attempted a rational organization of the underlying principles, and this volume will enable a serious worker in the field of adsorption chromatography to better understand and predict the separation of complex nonionic organic compounds.

After a brief introduction, the author discussed "The Chromatographic Process and Techniques of Separation," "General Aspects of Adsorption," "Isotherm Linearity," "Bed Efficiency," *etc.* The chapter on "The Role of Sample Structure" is particularly interesting, and one wishes that the author had devoted more effort on this aspect.

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NOTICES

Proceedings of the 3rd International Pharmacological Meeting, 1966 Sau Paulo, Brazil. Pergamon Press Inc., 44-01 21st St., Long Island City, New York, NY 11101, 1968. 16 × 23.5 cm. The proceedings are presented in 11 volumes with the individual pertinent data as follows. Vol. 1: *Mode of Action of Anti-Parasitic Drugs.* Edited by J. RODRIGUES DA SILVA and M. J. FERREIRA. x + 119 pp. Price $9. Vol. 2: *Pharmacology of Reproduction.* Edited by E. DICZFALUSY. vi + 126 pp. Price $9. Vol. 3: *Clinical Pharmacology.* Edited by R. K. RICHARDS. vi + 113 pp. Price $9. Vol. 4: *Mechanisms of Drug Toxicity.* Edited by H. RASKOVA. vii + 104 pp. Price $9. Vol. 5: *Control of Growth Processes by Chemical Agents.* Edited by A. D. WELCH. vii + 91 pp. Price $8. Vol. 6: *Drugs in Relation to Blood Coagulation. Haemostasis* and *Thrombosis.* Edited by G. V. R. BORN. vii + 126 pp. Price $10. Vol. 7: *Physico-Chemical Aspects of Drug Action.* Edited by E. J. ARIENS. ix + 385 pp. Price $14. Vol. 8: *Salt and Water Balance.* Edited by K. H. BEYER. viii + 109 pp. Price $9. Vol. 9: *Pharmacology of Pain.* Edited by R. K. S. LIM. viii + 250 pp. Price $13. Vol. 11: *Immunopharmacology.* Edited by H. O. SCHILD. ix + 166 pp. Price $13.

III International Pharmacological Congress—International Symposium on Vaso Active Polypeptides: Bradykinin and Related Kinins. Edited by M. ROCHA e SILVA and H. A. ROTHSCHILD. Available from Dept. of Pharmacology, Faculty of Medicine, Ribeirao Preto—S.P., Brazil, 1967. 300 pp. (in English). Price: unbound $10.00; bound $12.50.

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Food Additives and Contaminants Committee: Second Report on Cyclamates. Her Majesty's Stationery Office, London, England, 1967. Available from Sales Section, British Information Services, 845 Third Ave., New York, NY 10022. 5-page pamphlet. Price Tenpence net. Approx. 30 cents U. S.

Gamma Globulins: Structure and Control of Biosynthesis. Proceedings of the Third Nobel Symposium, June 1967, Sodergarn, Sweden. Edited by J. KILLANDER. John Wiley & Sons, Inc., 605 Third Ave., New York, NY 10016, 1968. 643 pp. 16.5 × 24 cm. Price $32.00.

Fibrinogen. Edited by KOLOMAN LAKI. Marcel Dekker, Inc., 95 Madison Ave., New York, NY, 1968. xiii + 398 pp. 16 × 23.5 cm. Price $19.50.