BOOK REVIEW

LE CURARE. Journées Thérapeutiques de Paris, 1948. G. Doin et Cie., Paris 1949.

It would have astonished both the discoverers of curare and early workers on it to read in a volume such as this the diversity of purposes for which curare has come to be used. But one pioneer, perhaps, might even be disappointed that we still understand so little of some of the problems he raised. An account by L. Binet of a few unedited notes by Claude Bernard reveals his versatility. In them, he distinguishes contractility from nervous irritability; he records variations of sensitivity to curare among different muscles, different species of animal, at different temperatures; and he speculates on the action of curare on ferments, its relation to the circulation, and the modification of its absorption by mucus. Scanty though these notes are, they make a fitting introduction to the whole symposium.

The remaining articles (nine in number) provide a useful summary of our present knowledge, without delving far below the surface. They are written for the clinician, rather than for the physiologist or pharmacologist. Thus M. Polonovski, in a chemical article, prudently avoids the quicksands, in which so many have floundered, of speculation about the chemical structure necessary for curare-like activity. He rightly draws attention, however, as others have done, to three significant points: (a) the intensification of activity by introducing a second quaternary group; (b) the existence of compounds of tertiary nitrogen, whose curare-like action is diminished by quaternisation; (c) the extent to which the existence of so many choline derivatives possessing curare-like action corroborates "*s'il en était besoin, l'hypothèse féconde de Dale et Feldberg.*"

J. Reuse, discussing the pharmacology and physiology of curare, divides his paper in the conventional way according to the actions of the drug on the various systems of the body. He also adopts a simple definition of curarisation as "a reversible interruption of transmission of excitation from the motor nerve of a striated muscle." Such division and such definition are sufficient for many purposes; but the lucidity which they confer on the discussion is to some extent spurious. For the definition, as it stands, includes the effect of procaine, Ca^{++} lack, and Wedenski inhibition, and excludes the effects of curare itself at the ganglionic synapse. Similarly the division of the description of the actions of curare according to the systems of the body involves the dispersal of one group of actions (say that due to histamine release, or to ganglion blokade) over several independent sections. It will soon be essential in such discussions, if it is not already, to bring out explicitly and individually those functions of curare which are well-defined. The clinician will not be the last to appreciate classification of this sort. Apart, however, from such general considerations, this section is useful, particularly in setting some of the continental literature in relation to that of this country and the U.S.A.

J. Cheymol and E. Corteggiani contribute a comprehensive and valuable section on assay. There are a few omissions: the method suggested by Feldberg and Lin using the peritaltic reflex of the intestine; the perfusion method of Laidlaw; and recent methods using the righting reflex or the fall from a rotating drum of mice and rats. But it is important that they choose,

as the test of most interest in assessing a curare-like compound for human therapeutic use, the rabbit head-drop test. The priority, in this context, of experiments on the whole animal over tests *in vitro* deserves emphasis.

The remaining sections concern the use of curare in surgery, convulsion therapy, neurology, obstretrics, gynæcology, and vascular disease, which are outside the province of the reviewer. The techniques used are based on those elaborated by Griffiths, Bennett, Gray, Cullen and other pioneers. There are a few minor errors, including one by which Scott M. Smith, the subject of the well-known and courageous experiment in complete curarisation becomes, by binary fission, two American anæsthetists Scott and Smith. It is clear from such accounts as these that the difficulties of sustained curarisation (e.g. for spastic nervous disorder, or for tetanus) are far from being conquered. This is not simply a question of paralytic side-effects; for instance, an outstanding problem is the state of shock into which patients with tetanus treated by curare appear to fall. It seems probable that curare will preserve its baffling but fascinating role in pharmacology for many years to come. W. D. M. PATON.

ABSTRACTS (*continued from page* 468)

Iodine and Available Chlorine. Determination of Bactericidal Efficiency by Semi-micro Methods. L. Gershenfeld and J. A. Palisti. (*Amer. J. Pharm.*, 1949, **121,** 337.) Two procedures were used, namely that of Klarmann and Wright (*Amer. J. Pharm.*, 1948, **120,** 146) and a modification of the U.S. Food and Drug Administration method. The organisms used in both instances were 24-hour cultures of *Salmonella* (*E.*) *typhosa* and *Staphylococcus aureus,* and the materials tested were tincture of iodine U.S.P., and sodium hypochlorite solution containing 2 per cent. of available chlorine. In the first method, 0·05 ml. of the culture was mixed with 0·5 ml. of different dilutions of the disinfectant. After being maintained at 20°C. for 10 minutes, 2 ml. of N/10 sodium thiosulphate was added, followed by 10 ml. of culture medium. The tubes were then incubated for 48 hours at 37°C. The phenol controls were treated similarly, except that the sodium thiosulphate was omitted. In the modified F.D.A. method, 0·5 ml. of culture was added to 5 ml. of diluted disinfectant at 20°. After 10 minutes, 2 ml. of N/10 sodium thiosulphate was added and one 4 mm. loopful of the mixture was transferred to 10 ml. of culture medium in a tube which was then incubated at 37°C. for 48 hours. With the Klarmann and Wright method, 1:4,000 of available chlorine killed *S. typhosa* and 1:5,000 killed *Staph. aureus* in 10 minutes, the corresponding concentrations of iodine being 1:8,000 and 1:6,000 respectively. With the modified F.D.A. method the corresponding concentrations were: available chlorine, 1:16,000 and 1:12,000; iodine, 1:12,000 and 1:13,000. The phenol coefficients were, by the Klarmann and Wright method, available chlorine, 44 against *S. typhosa* and 62 against *Staph. aureus*; iodine, 89 against *S. typhosa* and 75 against *Staph. aureus*; by the modified F.D.A. method the corresponding figures were: available chlorine, 177 and 171; iodine, 133 and 185. H. T. B.

Penicillin and Tubercle Bacillus: Tubercle Penicillinase. C. N. Iland and S. Baines. (*J. Path. Bact.*, 1949, **61,** 329.) While several authors have reported inhibition by penicillin of the growth of *Mycobacterium tuberculosis,* Ungar and Muggleton (*J. Path. Bact.*, 1946, **58,** 501) claimed that penicillin

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