oughly convincing. . . . The first optically active narcotics which we have investigated are the *sec.*-butyl alcohols. . . . the published experiments on the isomeric *sec.*-butyl alcohols are inconclusive and conflicting. Our experiments differ from those previously reported in that we have given the drugs to mammals by injection. . . . The optically isomeric *sec.*-butyl alcohols being equal in anesthetic activity, there is no indication that any asymmetric process is of importance in the mechanism of this particular narcotic phenomenon. As will be shown in the second paper of this series, this conclusion cannot be extended to the narcosis produced by drugs of other chemical groups."

J. C. M. C.

BUTLER, T. C.: *The Anesthetic Activity of Optical Antipodes. II. The Arabinochloraloses.* J. Pharmacol. & Exper. Therap. **69**: 229–235 (July) 1940.

"In 1894 Hanriot found that chloral reacts with *l*-arabinose, as it does with glucose, to form two isomeric products. By analogy with the glucochloraloses, these were called *a*- and *B*-arabinochloralose. The structures of the chloraloses, or even the relationship of the *a*- to the *B*- form, are still not known with certainty. . . . By reaction of chloral with *d*- and with *l*-arabinose, four isomeric arabinochloraloses (two pairs of antipodes) have been obtained. The four compounds have been tested as anesthetics in mice. *a-l*-Arabinochloralose is much more active than its antipode. *B-d*-Arabinochloralose is somewhat more active than its antipode. . . . The results of the experiments reported in these two papers are perhaps pertinent to the question of the field of applicability of any general theory of narcosis. It is true that there are minor differences in the effects produced by the arabinochloraloses and by the butyl alcohols. But all bring about the extensive depression of sensory and motor function which is ordinarily recognized as 'general anesthesia,' an effect regarded as typically 'narcotic.' The fact that asymmetry appears to be important in the action of the chloraloses but not in the action of the alcohols suggests, although it does not prove, that an animal may be anesthetized in more than one way, and that the search for one all-inclusive theory of narcosis may be futile. It is conceivable that in the cell, the normal function of which depends on many chains of complex physical and chemical events, the interference with these processes at any one of many points might lead to reversible depression of irritability."

J. C. M. C.

KRANTZ, J. C., JR.; CARR, C. J.; FORMAN, S. E., AND EVANS, W. E., JR.: *Anesthesia. I. The Anesthetic Action of Cyclopropyl Methyl Ether.* J. Pharmacol. & Exper. Therap. **69**: 207–220 (July) 1940.

"Although nearly a century has passed since the introduction of ether as a general anesthetic it occupies still a position of preeminence among the volatile anesthetics. After the introduction of ethylene into general anesthesia by Luckhardt in 1923, the development of a hybrid molecule between the two narcotic agents occurred to Leake. This concept of Leake was realized in the synthesis of divinyl ether by Ruigh and Major which compound has advantageously augmented the armamentarium of the anesthetist. In 1929 Henderson and Lucas developed the use of cyclopropane as a general anesthetic, which now possesses a meritorious record in general anesthesia. It occurred to the authors that it would be of interest from a chemotherapeutic standpoint to prepare a hybrid molecule between ether and cyclopropane. Besides, it was hoped that such a substance might add an-

other useful anesthetic to those now in general use. . . . The authors succeeded in developing a method of synthesis for the homologous series of cyclopropyl aliphatic ethers. . . . The first three members of the series have been synthesized and identified. The first member of the series, namely, the methyl ether has been designated in this laboratory as cyprome ether. The compound is a colorless mobile liquid, possessing an odor similar to that of cyclopropane. . . .

"The union of the molecule of cyclopropane through an ether linkage with the alkyl radical, methyl, results in the formation of a volatile liquid posessing anesthetic properties in many species of animals. Cyprome ether is a more potent anesthetic than ethyl ether, although it is not so potent as chloroform. The concentration producing surgical anesthesia in the blood of the dog averages 0.10 per cent. Its anesthetic index as measured on the dog is 2.31; that of ethyl ether is 1.76. It should be emphasized that this difference arises mainly from the short induction period of cyprome ether compared with that of ethyl ether. In the monkey, cyprome ether produces no liver damage as shown by the bromsulfonphthalein test. In the rat, histopathological changes are not found in the liver or kidneys after repeated anesthesias. The cardiac toxicity upon perfusion of the frog's heart in situ is of the order of magnitude of that of ethyl ether, possibly slightly more toxic. In concentrations required to produce surgical anesthesia in the blood of the dog, the frog's myocardium did not differentiate between Howell-Ringer's solution and that containing cyprome ether. The explosive range of concentrations of cyprome ether and ethyl ether with oxygen and air appears to be about the same. The oil/water coefficient of cyprome ether is 49 per cent. greater than that of ethyl ether. The concentration in air required to produce anesthesia is from one-half to two-thirds that of ethyl ether. Cyprome ether boils 9.5° higher than does ethyl ether. The blood pressure remains high and the pulse good under deep surgical anesthesia in the dog with cyprome ether. The authors wish to emphasize that many of the studies reported in this first communication are still in their incipiency. More extensive investigations are in progress. This first approximation of the pharmacology of cyprome ether, in our opinion, warrants its careful and judicial trial in man by skilled anesthetists. . . .

"These studies having been completed, the authors deemed that it had been demonstrated that cyprome ether warranted trial as a general anesthetic in man. One woman aged 55 years, a hospitalized patient requiring an operation of short duration (rectal fistula), volunteered and was selected for the first anesthesia. At 10:45 a.m. on Saturday, April 20, 1940, Dr. George A. Shannon began the administration of cyprome ether by the drip method. At 10:49 a.m. surgical anesthesia was obtained. At 10:55 a.m. Dr. Herbert Wilkerson directed the discontinuing of the anesthetic. At 11:02 the patient responded to the call of her name. Her recovery was uneventful. Blood-sugar level and N. P. N. were not significantly changed. The carbon dioxide combining power of the blood one hour after anesthesia was 50 volumes per cent. No control was available."

J. C. M. C.

BUTLER, T. C., AND BUSH, M. T.: *The Metabolic Fate of 1-methyl-5-allyl-5-iso-propyl Barbituric Acid (Narconumal)*. J. Pharmacol. & Exper. Therap. **69**: 236–239 (July) 1940.

"We have shown that the short duration of anesthetic action of certain N-methyl barbituric acids is largely at-