

recovered, and it was slowly recognized that some were irritative, some anæsthetic, and some toxic.

IRRITATIVE IMPURITIES

Concerning impurities causing irritation, these may be anterior nasal and due to alcohols or acetones; or nasopharyngeal and bronchial due to aldehydes. Aldehydes irritate, causing mucous in an ether dilution of less than '1 per cent. and it is possible that they may have something to do with ether pneumonia. The objectionable and often irritating odours of commercial ethers are due mainly to organic acids.

ANÆSTHETIC DERIVATIVES

Let us now consider anæsthesia proper. The substances derived, may be divided into two classes:

First. Narcotics (producing peripheral congestion and drunkenness);

Second. Analgesics (producing loss of sensation and peripheral vaso-motor spasm).

Absolute di-ethyl ether as has already been stated will not anæsthetize. Its administration produces peripheral congestion, and drunkenness. Prolonged administration causes muscular tremor, shortness of breath with expiratory grunt, a terrible sensation of impending danger, and increased congestion. As much as twenty ounces have been administered to one patient with only this effect. If, however, a small amount of carbon-dioxide be present, the peripheral congestion is relieved, and the patient enters the natural anæsthetic and analgesic stages. In order, therefore, to obtain anæsthesia proper, we must have acting a narcotic such as di-ethyl ether, together with an analgesic such as carbon-dioxide.

The carbon-dioxide-absolute-ether anæsthesia constitutes a type of its own. In a previous paper, read at the Academy of Medicine in Toronto, I compared the action of absolute ether to that of nitrous oxide, with which the carbon-dioxide tension factor is also a necessity. The anæsthesia produced by this carbon-dioxide-ether method is very similar to that obtained from nitrous oxide, and the recovery almost as rapid. It is of interest that Hickman, as early as 1828, used carbon-dioxide alone as an analgesic. Of course, in cases suffering from certain metabolic disorders it is contraindicated.