

a cup of tea, with two tablespoonfuls of red wine or brandy, which, in the case of alcoholic subjects, is perhaps best administered by the rectum, after Witzel's method. It is only in the case of powerful adults that we give a hypodermic injection of morphia ( $\frac{1}{6}$  to  $\frac{1}{2}$  gr.) half an hour before operation.

The anaesthesia is induced with ethyl bromide dropped on a special mask, 5 c.c. being used for women, 20 to 30 c.c. for robust men. Narcosis is obtained in from 60 to 90 seconds, after which it is maintained with ether administered by the drop method, or with Braun's apparatus. In children and weakly subjects, ether alone should be used from the commencement of the operation. In the latter case, if the mixture of ether and air fails to produce sufficiently-deep anaesthesia, diluted chloroform vapour may be given for a short time with a regulating apparatus, such as that of Braun or Roth-Dräger.

When there is any reason for anxiety it is an excellent practice to combine the influence of a local anaesthetic by means of an injection of cocaine when the patient is under ethyl bromide, or in the stage of analgesia which, according to Sudeck, follows the early administration of ether. The pain of incising the skin can thus be prevented, while sensation in the deeper portions of the wound is destroyed by infiltration (Schleich), or by endoneural injections into the exposed nerves (Cushing).

Lenander generally combines local anaesthesia with repeated administrations of ether or chloroform in cases where sensitive tissues like the parietal peritoneum have to be divided or torn, and again when the wound has to be closed.

In maintaining the anaesthesia it is of advantage to adhere to the minimum dose. Young and inexperienced anaesthetists are inclined to over-administration: and, if the truth were told (v. Mikulicz's interesting statistics), it is chiefly from this overstepping of the permissible dose that deaths under anaesthesia occur.<sup>1</sup> The chief advantage of an apparatus such as Braun's (and the earlier ones of Geppert, Kionka, Wohlgemuth, and the present Roth-Dräger apparatus) is that it makes it impossible for an inexperienced practitioner or an unqualified man to exceed the anaesthetic limit. The drop method possesses a similar advantage, but it not infrequently becomes a "pouring method," as a result of inexperience or youthful zeal.

Insensibility to pain is the test of sufficient anaesthesia. The large majority of anaesthetists consider it their duty to take observations of the expansion and contraction of the pupil of the eye, the disappearance of the corneal reflex, the variation of the pulse, and the relaxation of the muscles, very interesting experiments in the anaesthetising of animals, but not advisable in the case of operations on the human subject. The production of analgesia is the only object in view in the latter case, although it is a matter of some difficulty to convey this instruction to the mind of a young and impulsive practitioner.

2. *Local Anaesthesia.* Before depriving a patient of the benefits of a general anaesthetic, a surgeon must decide under what conditions general anaesthesia can be dispensed with. The first request made by the generality of patients is that they may be able to "sleep" during the operation. Not only do they wish to be free from pain, but they want to be spared the excitement usually entailed by an operation. The analgesic effects of the early stage of ether narcosis will often prove sufficient. We agree with Mikulicz (*loc. cit.*) and Küttner that on sensitive people the psychic effects of the excitement associated with local anaesthesia may have results more dangerous than those of a general anaesthetic.

Local anaesthesia has invariably to be carefully considered where there are conditions present which render the administration of a general anaesthetic dangerous, as in cases of advanced disease in internal organs, blood changes, low blood-pressure, intoxications, diabetes, Addison's disease, advanced Basedow's disease, sepsis, status lymphaticus, and diseases of the cardiac muscle, liver, both kidneys, etc. When an operation cannot be performed by means of local anaesthesia, the means may be combined with narcosis, as we have already described.

The question further arises—To what extent should general anaesthesia be

<sup>1</sup> It is not by chance that we have had only one fatality in thirty-five years in private practice, where for most of the time we have employed the same anaesthetist.