

Crile and Matas were the first to adopt "conduction" anaesthesia for the amputation of a limb (arm and leg). Crile has shown that a 1 per cent cocaine solution is required, the action of which is almost immediate in distinction to the perineural injection. Its effects last, at most, half an hour, but it may be prolonged by the addition of adrenalin.

Crile and Cushing have demonstrated that the injection prevents shock, which otherwise manifests itself by a sudden fall in the blood-pressure whenever the nerves are divided.

(d) There is still another method of employing "conduction" anaesthesia, viz. that used by Cushing where endoneural injections are made during the course of an operation performed under local anaesthesia.

Cushing has shown that during an operation for hernia, the exposed trunks of the ilio-hypogastric and ilio-inguinal nerves can be anaesthetised by endoneural injection, a complete absence of pain resulting. We agree with Braun that this method is of great practical importance, as it suggests the advisability of an operator being prepared to anaesthetise, by perineural or endoneural injection, every exposed nerve, which will subject the patient to some amount of pain if cut transversely, or which supplies part of the area of operation.

4. *Spinal Anaesthesia (Rachicocainisation).* Since Bier, who introduced spinal cocaineisation, has warned us of the dangers to which it is liable, there are few surgeons who practise this method to any great extent.

Tuffier performs practically all his operations on the pelvis and the lower extremities (including cases of hernia) with stovain anaesthesia, and assures us that after several years' experience he would rather leave the performance of a stovain injection to his assistants than he would the administration of a general anaesthetic.

Cernezzi also speaks in eulogistic terms of the value of stovain in "conduction" anaesthesia. It is poisonous to animals in doses of (approximately) 1 gr. per pound) 18 gr. per kilo, proving that it possesses only one-third of the toxic power of cocaine. Cernezzi uses it along with adrenalin, as otherwise it has the effect of causing dilatation of the vessels. He injects up to 2 c.cm. (30 drops) of a $\frac{1}{2}$ per cent solution in saline, to which one drop of a 1 to 1000 solution of adrenalin has been added (Parke Davis). Stovain can be boiled without harm. The limit of a dose is 50 gr. ($7\frac{3}{4}$ gr.) of stovain and 1 mg. ($\frac{1}{64}$ gr.) of adrenalin, thus up to 100 c.cm. ($3\frac{1}{2}$ oz.) of his solution with 16 drops of adrenalin could be used. Cernezzi has also performed laparotomy under this anaesthetic.

So-called "spinal" anaesthesia comes practically under the classification of "conduction" anaesthesia. Braun points out that Eden's experiments on cats show that the nerve-roots in the spinal canal (which have no medullary sheath) are peculiarly sensitive to infiltration. An injection of water and of 0.2 per cent salt solution produced anaesthesia which continued for a considerable time. A solution of cocaine would therefore prove more efficient were it not that there is the same risk here as in local anaesthesia, namely, of reabsorption in the blood, a risk which we attempted to abolish in the latter form of anaesthesia by means of constriction and the addition of adrenalin.

The injection of a fluid into the subarachnoid space acts almost as powerfully as if it had been made directly into the blood. That stovain can be more readily borne by a patient, as Trendelenburg seems inclined to assume, because it produces local coagulation is a point which remains undecided.

Cernezzi states that stovain is precipitated in the presence of alkaline solutions, for which reason no alkali must be used when boiling or cleaning the syringe. Klapp has shown experimentally that intradural injections of milk sugar are absorbed much more rapidly than when the injection is administered subcutaneously. He also produced complete anaesthesia of the entire body in dogs without any symptoms of poisoning, by injections of oily or concentrated solutions of gelatine. Dornitz, under Bier's directions, has shown that in man the addition of adrenalin to a large extent retards the process of absorption. Notwithstanding this, the danger of uncontrollable absorption remains a great drawback in spinal injection,