The first report on the use of isopropyl chloride in anaesthesia was made by MacDonald (1950) who described its rapid action, lack of irritation to the respiratory mucosa, and quick excretion. In addition, it had apparently no side effects and, in particular, produced no marked changes in blood-pressure. This latter observation was a little surprising as ethyl chloride, its near relative, has a very profound effect on blood-pressure levels in the deeper planes of anaesthesia. However, the overall picture was attractive and, while it was noted that all the cases in MacDonald's series were adults, it was considered that this anaesthetic might be of great use as the main agent for the anaesthesia of children during dissection tonsillectomy.

Consequently, a series of fifty such cases was undertaken. The children's ages ranged from 3 to 12 years, and the anaesthetic technique used was the same for all.

**TECHNIQUE**

Atropine gr. 1/100 (0.6 mg.) by injection and Nembutal gr. 1½ to 3 (90 to 180 mg.) orally were given forty-five minutes before operation. Anaesthesia was induced by nitrous oxide and oxygen using a standard Boyle's machine. The isopropyl chloride had been placed in the ether bottle of the machine and was admitted to the circuit immediately after induction. The change-over was easy. Most patients accepted the vapour without any alteration.
of the respiratory rhythm. The concentration of isopropyl chloride was rapidly increased. Within two to three minutes the respirations became deep and regular (resembling the respiration seen with ethyl chloride) and the jaw was relaxed. A Boyle-Davis gag was introduced and during the operation the anaesthetic mixture was insufflated through the indwelling catheter on the gag.

RESULTS

The advantages of this agent were considerable. As it is a potent anaesthetic, the induction was rapid, and the total amount of the drug used was very small, averaging 1 ounce per patient. The recovery was almost as rapid, and the patients were conscious by the time they were returned to the ward. This was a great help to a busy nursing staff. There was no excessive vomiting, and all the children were fit to return home the next day. The relaxation of the jaw and muscles of the cervical region was excellent, even when the anaesthesia was light. The fact that the drug is non-irritant to the respiratory tract and has a rapid action permits the anaesthetist who may allow his patient to become too light during operation to deepen the anaesthesia quickly and with ease. All these properties would seem to indicate that this anaesthetic should be suitable for this operation.

Unfortunately, however, this was not the whole picture. MacDonald (1950) suggested a large margin of safety. In children, the margin was almost non-existent. It was found essential to reduce the concentration of isopropyl chloride once deep regular breathing was achieved. If this was not done, the respiration rapidly ceased, and the apnoea was followed immediately by a disappearance of the pulse beat. Artificial respiration for two or three minutes,
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however, restored the situation; natural breathing was resumed and the pulse became palpable.

DISCUSSION

Roualle (1950) has reported one case of cardiac arrest when isopropyl chloride was being used, and Cope (1950) had several patients who exhibited cardiac irregularities which he attributed to a reflex mechanism affecting a heart sensitized by this drug. The writer would suggest another source of danger, for his "situations" appeared to arise from the lack of margin between respiratory and circulatory depression, or indeed between moderate anaesthesia and gross overdosage.

Be that as it may, it is considered by the author that an anaesthetic agent which may produce such complications, even when it is being used with the extra care necessary for clinical trials, is not safe. These experiences have led to the abandonment of this otherwise very attractive anaesthetic.

REFERENCES