

fifty-six deaths recorded in the *Proceedings* of the Royal Society of Medicine would not have occurred. When the anaesthetic is given by a skilled anaesthetist and the operator is an expert the question is a little altered, but in hospital practice, where one is dependent upon continually changing house-surgeons, anaesthesia becomes very dangerous, whichever anaesthetic is used.—I am, etc.,
FREDK. SYDENHAM.
Birmingham, July 15th.

SUDDEN DEATH UNDER AN ANAESTHETIC.

SIR,—I have followed the correspondence on this subject closely and with great interest. Dr. Levy's letter in the issue of July 26th again brings to the front what would appear to be the most important point under discussion—namely, the danger of light chloroform anaesthesia. He emphasizes this condition as being the predisposing cause of death under chloroform, the exciting causes requisite to produce cardiac stoppage being of various character. Dr. Levy confesses that his conclusions regarding safe administration are not derived from clinical experience. My clinical experience makes it very difficult for me to accept Dr. Levy's theory, and a second and recent perusal of his paper of May 1st, 1914, *Proceedings* of Royal Society of Medicine, does not help me in this respect.

Granted that chloroform is a protoplasmic poison and that chloroform anaesthesia is a toxæmia, it would indeed be strange if the organism were to suffer less from a large percentage of toxin in the blood than from a small percentage. I was unaware, moreover, that full anaesthesia prevents traumatic stimuli from reaching the nerve centres and reflexly setting up ventricular fibrillation. I understand that Crile and others use the anoci-association method of operating because general anaesthetics are of no use whatever in blocking traumatic stimuli. Crile further maintains that "deep general anaesthesia, especially with chloroform, renders an animal subject to early collapse, and decidedly less capable of enduring a protracted experiment." I confess to finding these latter teachings much more in accordance with clinical experience.

Do I really belong to "the old school" in believing that the important factor in death under chloroform is the high percentage of chloroform in the blood stream? I feel sure that experience has taught many modern anaesthetists to believe this. Cannot the large majority of fatal cases be explained by the inhalation by the patient of a strong chloroform vapour followed by spasmodic or other mechanical obstruction to the respiration, and the incarceration of this strong vapour in the pulmonary alveoli until the blood absorbs it to a toxic degree? It would at least appear to explain the accidents seen in connexion with the crying child, the spasmodic irregular breathing of the stage of excitement, the long-drawn inspiration and closure of the glottis when the anal sphincter is stretched, the reapplication of the mask laden with a strong vapour when the patient is "coming out," and the mechanical obstructions to breathing sometimes permitted with dental and tonsil cases.

An analysis of cases of deaths under chloroform gives us little help as regards this problem, for, according to the theory I support, it matters not at all whether a drachm or an ounce of chloroform had been used when death took place, strength of vapour inhaled being the all-important factor. A drachm of chloroform would be ample to produce sufficient concentration to cause death.

I consider chloroform a most valuable anaesthetic, and far superior to any other agent in certain conditions; but its toxicity is liable to produce spasm, and its low volatility and consequent slow elimination make it a dangerous drug even in the hands of the most experienced if used for full induction in all cases. Very many patients can be safely anaesthetized with chloroform alone, but the administrator should never proceed to induce anaesthesia with this agent unless he is prepared to change to ether or ethyl chloride, or both, should indications for this change arise.

Anaesthetists, I am sure, will not agree with Dr. Levy that they do not teach, and that textbooks do not teach, the value of a uniform anaesthesia and the dangers of an intermittent administration. I should like, too, to believe that I have their approval when I teach that once the patient is under, he should be kept as lightly under as is

consistent with the nature of the operation and the needs of the surgeon.—I am, etc.,

Dundee, July 28th.

ARTHUR MILLS.

SIR,—The majority of those who have discussed the above subject in your columns are of one mind regarding the dangers of chloroform and the relative advantages of open ether. But it is surprising to find that no one has mentioned ethyl chloride anaesthesia, save as a means of shortening the induction stage. One had imagined that ethyl chloride was widely employed as an anaesthetic for the tonsil-adenoid operation. It is safe and short, yet also sufficient.

It would appear, however, from the views expressed, that the dissection method, requiring a relatively long anaesthesia, has been adopted as a matter of routine, even in children, by several of your correspondents. Now guillotine enucleation, as devised by Whillis, will entirely remove any tonsil, if the patient is a child, and gives good results in many adult cases. "Dissection" need be chosen only for the adult whose tonsil capsules have become bound down by adhesions, as after repeated attacks of quinsy.

If, therefore, the guillotine method will suffice for the average case, why this vogue for routine dissection with its attendant anaesthetic troubles?—I am, etc.,

Edinburgh, July 26th.

DOUGLAS GUTHRIE.

SIR,—Allow me to thank your many correspondents for their instructive comments on my report under the above heading. Their opinions differ in some respects, but on the whole it seems that to my questions ("Is there special danger in the operation of tonsil enucleation by dissection?" and "Is the light chloroform anaesthesia given by Junker and tube when the mouth is wide open a source of peril?") the answers are in the affirmative; and the general conclusion is that ether is the safest anaesthetic for this operation.

In his first letter Dr. Levy writes: "There is nothing unusual in the conditions attending the death." Considering that this is my first fatality in thirty years' constant administration of anaesthetics, I am surely entitled to the opinion that the conditions were distinctly unusual. He goes on to speak of my administration having been "intermitted." There is nothing in my report to justify such a statement; there was no intermission, and the administration was quite continuous, the change from a mask to a Junker tube and back again being done in a second or two. That the chloroform dose was "insufficient" is probably true, and I laid stress upon the fact that anaesthesia *must* be light when the vapour pumped through the tube is greatly diluted by air admitted freely through an open mouth and uncovered nose. It is a common experience in throat and nose work to find a temporary return from the Junker to the mask necessary in order to provide a sufficiently deep anaesthesia.—I am, etc.,

Eastbourne, July 21st.

H. S. GABBETT.

HOSPITALS FOR TUBERCULOSIS.

SIR,—I should like to make a few comments on the lecture by Dr. Batty Shaw in the *BRITISH MEDICAL JOURNAL* for July 26th.

1. So far as my experience goes, very few early cases have up to the present been treated in sanatoriums, and I am inclined to think that, were a careful history of all cases in sanatoriums taken with a view to discovering how long before admission they had been suffering from symptoms of activity, it would be found that most were far from early, but that in those which were early the result of treatment had been excellent.

2. With regard to early infection in childhood, I would observe this may be of two kinds: (a) By food, in which event it will be by the bovine bacillus, and this may produce some protection in later life against the human bacillus, though of course if sufficiently large in amount it may under favourable circumstances produce any of the various kinds of surgical tuberculosis; (b) by way of the respiratory tract, which, if the dose be large, may have most serious consequences; this is due to infection, and is extremely likely to happen in the neighbourhood of a not careful open case of pulmonary tuberculosis.