bellows again act as a gas reservoir. The expiratory valve is partially closed and manual ventilation may be produced by compressing the Oxford inflating bellows. As a result of the high resistance of the non-return valve of the ventilator, gas flow will occur in a to-and-fro manner in the expiratory limb unless the one-way valves of the Oxford bellows are in the circuit when manual ventilation is undertaken.

The Oxford ventilator, the Oxford inflating bellows, the soda-lime cannister and the necessary tubing may all be fitted conveniently on one shelf of a Boyle's machine. Economy of fresh gas is achieved, as this is a semi-closed or fully closed circuit. Because of the high resistance of the non-return valves in the ventilator, the circuit is unsuitable for spontaneous ventilation for more than a very short period of time.

I should like to thank Mr Neill Woodward for technical assistance in preparing the circuit, Miss Brenda France for secretarial help and Mr Richard Hook for the figure.

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FEED-BACK MONITORING OF HALOTHANE ANAESTHESIA

Sir,—I was interested to read Dr Suppan's article (1974) on feedback monitoring of halothane anaesthesia, using the tidal volume and respiratory rate as feedback controls.

The tidal volume would appear to be satisfactory for this purpose, but the use of the respiratory frequency appears to be based on the misconception that increasing concentrations of halothane anaesthesia produce decreasing frequencies of respiration. While it is true that the respiratory frequency increases when the patient is "too light", it is not true that it decreases when he is "too deep", and this may explain Dr Suppan's difficulties with this method.

Our studies of respiratory patterns during halothane anaesthesia (Al Abrak, Briscoe and Payne, 1975) show that in the absence of surgery, increasing concentrations of halothane consistently produce increasing frequencies of respiration. A feedback system that increases the halothane concentration as the respiratory frequency increases is, therefore, potentially very dangerous.

On the other hand, the tidal volume provides an excellent alternative. Our work confirms that it decreases consistently with increasing halothane concentrations, and an increasing tidal volume can only indicate that anaesthesia is lightening, provided the airway is clear.

C. Briscoe
Norwich

REFERENCES

Sir,—I agree with Dr Briscoe's comments on the respiratory frequency. I think my paper made it clear that tidal volume is the best parameter to use for feedback control. However, it is important to ensure that the feedback system should not only maintain a steady state of one variable, but also respond to surgical events. In common with tidal volume, the respiratory frequency will increase following surgical stimulation, though not as quickly, and it will not always revert to the presurgical value at the end of stimulation. I mentioned in my paper that when the respiratory rate is used, the situation should be reviewed every 30 min as the steady state value may change; experience gained since the studies reported confirm this.

Dr Briscoe also mentions that, in the absence of surgical stress, increasing halothane concentrations lead consistently to increasing rates of respiration. The feedback system described has only three vaporizer positions and will therefore not deliver halothane concentrations which increase progressively. Although a continuously high concentration of halothane may be expected to be delivered, in practice this does not occur provided the action limits are not set too close to the steady state value.

P. Suppan
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A SIMPLE SAFETY DEVICE

Sir,—The complete or even partial disengagement between endotracheal tube connection and the Y-piece of an anaesthetic circuit is a potential hazard to all anaesthetized patients. In order to prevent this we have made an L-shaped slit into the distal portion of the Y-piece to receive a small pin welded to the metal connector of the endotracheal tube (fig. 1).

FIG. 1. Simple modification to the Y-piece of an anaesthetic circuit, increasing its safety.

Any hospital machine shop can do this within a couple of hours. The Y-piece is then locked into the connection by turning approximately 90 degrees.

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