take over the ventilation of patients since the preset tidal volume cannot be exceeded.

The ventilator attachment described is now marketed as the Cape Universal Ventilator Attachment by Cape Engineering Ltd., Warwick.

ACKNOWLEDGEMENTS
We wish to thank Dr. M. L. M. Manford and Dr. T. R. Gould, Queen Mary's Hospital for Children, Carshalton, Surrey, for their invaluable help in the clinical assessment of the ventilator attachment.

REFERENCES

CORRESPONDENCE
None were rejected because of their physical status. Our method was to prepare the patients by giving them acetazolamide 500 mg the evening before operation and 250 mg on the morning of operation to ensure low intraocular tension. This premedication was omitted in later patients in the series. Ninety minutes or more before operation dehydrobenzperidol 5 mg was injected intramuscularly. They also had local anaesthetic and mydriatic drops instilled into the eye before proceeding to the theatre. On arrival in the theatre a Gordh needle was placed in a vein in the dorsal of the left hand, and a blood-pressure cuff placed on the left arm. The pressure was taken by auscultation, before proceeding, and at frequent intervals thereafter. Phenoperidine was then injected slowly through the Gordh needle in increments of 0.5 mg and flushed through with saline. The dose was judged to be sufficient when the respiratory rate dropped to about 10 b.p.m., or the speech became slurred, or the patient became very drowsy. This induction dose varied from 1 to 2.5 mg. Most patients received 1.5 mg. The surgeon then prepared the patient and produced akinesia by one of the standard methods. Retrobulbar block was not used in any patient and no other injection of local anaesthetic was given. Akinesia was omitted in later patients in the series. Surgery then proceeded. Respiratory adequacy was judged by the somewhat crude method of observing the movements of chest and abdomen. At the conclusion of the operation the Gordh needle was withdrawn and the patient was returned to the ward, where vital signs were closely watched by a nurse.
Operating conditions were judged excellent. Patients were relaxed, quiet and co-operative. They did not respond to painful stimuli except in two cases, each of whom was then given an additional dose of phenoperidine. One patient had involuntary movement of her external ocular muscles throughout surgery; this was arrested and a successful completion of the operation. She was one of the later group of patients who received no akinesia. The other patients in this group were completely satisfactory. Intra-ocular pressure was satisfactory in all cases. This includes the later patients in this series who received no atropine or any other anti-cholinergic drugs in their pre-operative preparation. Patients often went to sleep during the operation, but could be aroused easily without starting or moving, and were instantly co-operative.

Blood pressure usually showed a slight drop of anything up to 10 per cent but this never caused anxiety. This followed the premedication dose of dehydrobenzperidol. No further drop in blood pressure followed the injection of phenoperidine. There was no post-operative hypotension.

Respiration rate slowed on the injection of phenoperidine but in most cases respiration was judged adequate. The 84-year-old man with severe bronchitis and emphysema had a very benign postoperative course, especially considering the degree of impairment of his pulmonary function. It is worth considering that although respiratory depression is a characteristic feature of phenoperidine, its effect is so transient (about 1 hour) that his condition was not aggravated. Respirations were judged to be inadequate in two cases, each of whom had received an additional increment of phenoperidine after the induction dose. This was quickly reversed with nalorphine in small doses (2 mg and 5 mg). It is possible that the additional dose of phenoperidine was not really necessary in these cases and that the greater degree of catatonia resulting from an increased premedication dose of dehydrobenzperidol, e.g. 7.5 mg or even 10 mg, might have resulted in a completely serene peroperative course. No patient complained of pain when specifically questioned after operation.

Three patients vomited once post-operatively. Provided vomiting did not occur. An increased dose of dehydrobenzperidol would probably have reduced the incidence of postoperative vomiting. Postoperative analgesics were never required.

All patients were questioned in the postoperative period and asked specifically about pain or any unpleasant sensation. All denied anything unpleasant except one woman who had a feeling that she was "in a closed box". This sensation lasted for some hours after operation. In summary, although this was not a very interesting case and are to be congratulated on the successful management. Their conclusion, however, that a red rubber cuffed tracheostomy tube was responsible for this complication and that such tubes should therefore be avoided, should not remain unchallenged. We have used the James tube (red rubber, manufactured by M.I.E.) for the past six years in all our adult respirator cases. In over 500 patients, managed with red rubber tubes up to 300 days, there was one tracheal stenosis; this patient had a James tube in place for only four days and had a stenosis just below the tracheal opening. Murphy and others (1966) reported four cases of tracheal stenosis with a metel tracheostomy tube and a latex cuff and were able to show that a faulty position of the cuff can produce a stenosis in dogs.

There is no information about the surgical technique used in the presented case. It is stated that the tip of a James tube corresponded to the level of the stenosis; one must assume that a pressure necrosis with subsequent scar formation was produced by the tip of the tube, indicating that the tube had been in a faulty position. Under such circumstances a tracheal lesion would occur regardless of the material of the tracheostomy tube.

An abnormal sensitivity to red rubber in this patient would likely give a reaction not only confined to the tip of the tube. We have seen a severe tissue reaction with bleeding in the trachea and in and around the tracheal stoma when a red rubber tube had been replaced by a plastic tracheostomy tube (Portex); the reaction subsided within a few days after returning to a red rubber tube.

In our hands the red rubber James tube has performed a valuable service and one would like to see a more weighty evidence to justify the authors' conclusion, that it should not be used.

W. E. Spoerel
London, Canada

REFERENCES


HALOTHANE IN OXYGEN

Sir,—Recent publications have again focused attention on the use of halothane in oxygen and the economy that can be effected with closed circuit techniques.

I would like to describe a method that I have used here for the past eight months. Halothane is expensive in Canada and economy in the use of anaesthetic gases is of value in isolated situations such as St. Anthony where transportation of cylinders is a problem.

The anaesthetic apparatus consists of the Boyle Model 10 anaesthetic machine, the Boyle Mark 3 carbon dioxide absorber, and the Boyle Mark 3 ether vaporizer attached to the inspiratory mount of the carbon dioxide absorber.

The ether vaporizer has been modified by removing the float, thus making it a less efficient vaporizer, and an adhesive strapping stop has been placed across the concentration control preventing this being put at more

F. MARTIN CAMERON
Boston

REFERENCES
