When halothane was introduced it seemed to be the ideal agent for neurosurgical anaesthesia. It was non-inflammable. Its vapour was virtually non-irritant and was readily added to nitrous oxide and oxygen. The drug had the additional advantage of relatively rapid elimination and, finally, its effect on the blood pressure made it possible to use it when induced hypotension was required. If halothane by itself did not produce the requisite very low blood pressure needed for aneurysm surgery, it so potentiated the action of hexamethonium and other hypotensive agents, that instead of being somewhat unreliable and capricious, such combinations provided an infallible means of dropping the blood pressure to any necessary level.

Most of these virtues of halothane are still retained and, apart from the unpleasant shivering which sometimes occurred in the postoperative period, which might even seem like an epileptic fit, they and the smooth induction and recovery associated with the administration of the drug would still commend it. Its wide popularity in this field even today would indicate that both anaesthetists and surgeons are still relatively well pleased with it. None the less there have been rumblings of dissatisfaction over the last few years. For example, in 1962 attention was drawn to the rise in intracranial pressure which followed the use of halothane (Marx, Andrews and Orkin, 1962). This observation was amply confirmed by other workers (Hunter, 1964a, b; McDowall, Harper and Jacobson, 1963). At first, however, it appeared that the rise in intracranial pressure produced by halothane was transient and would presently be corrected by readjustment of the various components which make up the bulk of the intracranial contents (McDowall, Barker and Jennett, 1966). More recently, however, it has been clearly demonstrated that halothane in anaesthetic concentrations almost invariably increases the cerebral blood flow (McDowall, 1967) and whatever else follows there must be an increase in the bulk of the brain. Further, it has recently been shown that this action is not confined to halothane. It is also shared by trichloroethylene and methoxyflurane (McDowall, 1965, 1968). What is even more disturbing is that the rise in intracranial pressure produced by these agents is infinitely more serious in patients whose intracranial pressures are already raised at the time of giving the drugs than it is in those whose intracranial pressures are normal (Gordon, 1968; Jennett et al., 1969).

Finally, the last stronghold of halothane in neurosurgery and anaesthesia for cerebral angiography seems about to be assailed. Nitrous oxide, oxygen and halothane anaesthesia in the spontaneously breathing patient, a widely popular technique for such cases, is associated with a certain amount of carbon dioxide retention, whose degree varies considerably according to the drugs used for premedication. It has now been shown that the quality of angiograms of patients breathing spontaneously with a slightly raised PaCO₂ is much poorer than is obtained in patients subjected to mild hyperventilation with the aid of anaesthesia which does not involve the use of halothane. Indeed in more than one case the films obtained of the spontaneously breathing patient would have passed for normal, whilst those obtained during hyperventilation revealed the presence of a tumour (Samuel, Grange and Hawkins, 1968).

It is, however, not enough to condemn halothane in anaesthesia for neurosurgery. A satisfactory alternative must be available. Some, no doubt, will prefer to immobilize their patients with relaxants and ventilate the lungs with nitrous oxide.
oxide and oxygen alone. Others will bear in mind the numerous reports of awareness during anaesthesia and will seek for some supplement to nitrous oxide and oxygen. Many years ago Wylie (1951) recommended pethidine for this purpose and the experience of Hunter (1964b) would suggest that in patients with supratentorial tumours at least, analgesic drugs can safely be given in appropriately small doses to all but the near-comatose. In the posterior fossa, however, circumstances are different, and the dangers of giving analgesic drugs to those with disorganized vital centres are always present, though it is rarely possible to recognize this except in the presence of extreme compression. In these cases a form of neuroleptanalgesia may be preferred even although this entails the administration of analgesic drugs with an action like morphine, in the not entirely justified hope that the brevity of action of modern agents of this type will lead to the disappearance of the danger of potential respiratory depression before the end of the operation, when it becomes necessary for the patient to resume spontaneous breathing. The position is infinitely more complicated if the surgeon demands the continuance of spontaneous respiration throughout the procedure, and the use of a volatile supplement to nitrous oxide and oxygen still, in fact, offers the best compromise.

One other possibility perhaps deserves consideration, although on theoretical grounds it may seem unacceptable. This is the use of doses of thiopentone or a similar barbiturate to supplement nitrous oxide and oxygen. Such agents have the inherent advantage of reducing cerebral blood flow. And the action of barbiturates on the respiratory mechanism appears to be somewhat different from that of the opiates (Hunter, Pleuvry and Rees, 1968). Further, large doses of thiopen-