spinal anaesthesia has taken a longer time than usual, and in which the extreme nervousness of the patient makes it undesirable to proceed with this form of anaesthesia alone, the addition of intravenous anaesthesia is recommended. At the end of a long operation, too, when the spinal anaesthesia is commencing to 'wear off,' intravenous anaesthesia is to be preferred to ether or nitrous oxide for supplementing the spinal anaesthesia. In such cases, the intravenous use of morphine and 'Omnopon' . . . will provide a supplementary general narcosis that will permit satisfactory completion of the operation. . . . This form of intravenous narcosis is contraindicated for patients over sixty years of age, because even a small dose produces mental confusion and impairs their chances of ultimate recovery. . . . In the series of cases here recorded there were no pulmonary complications, notwithstanding the fact that many of the patients were feeble and debilitated subjects and would be considered 'poor risks' for any form of anaesthesia. It is important, however, to mention that 'poor risks' required special care in regard to management and dosage; with these precautions they showed no ill effects or sequelae. . . . In this series of 700 cases there was one death. This can be attributed to faulty selection of the anaesthetic agent. . . . Intravenous anaesthesia should not be employed when good muscular relaxation is imperative, as the latter can be achieved only at the expense of grave risk to the patient." 2 references.

J. C. M. C.

EVANS, FRANKIS: *Continuous Intravenous Adrenaline in Spinal Anaesthesia; for the Control of Blood-pressure.* Lancet 1: 15–17 (Jan. 1) 1944.

"Many recommendations have been made for the control of blood-pressure during spinal analgesia, but the pressor effects of the various drugs have been both transient and disappointing when used in conjunction with high spinal block. . . . Pitkin uses adrenaline mixed with a starch protein intramuscularly, and he claims excellent results with this method which liberates the adrenaline slowly over a long period. I thought, however, that adrenaline was best administered continuously in minute dosage during the time that it was most needed, and by a method that gave the anaesthetist complete control over so powerful a drug. Adrenaline in adequate dilution is eminently suited for intravenous injection because it is so rapidly oxidised in the body. . . . When adrenaline is administered intravenously by the drip method in suitable dilution the blood-pressure rises and the heart shows a compensatory slowing. The blood-pressure of a patient who has had a high spinal block may fall as low as 50 mm. Hg. If dilute adrenaline solution be dripped into a suitable vein the blood-pressure rises until the normal is reached. If the drip then be continued at the same rate the rise will continue to a very high figure (240 mm. Hg). On the other hand, if the drip be stopped the pressure will fall rapidly to its original low level. The adrenaline should be so regulated that the blood-pressure is maintained at a suitable level, so that the patient does not lose too much blood from hemorrhage, but is given an adequate circulation. Should the drip be suddenly greatly accelerated it is possible to cause cardiac irregularity. This however, is never seen if reasonable care is taken. . . . When this series of cases was first begun a solution of 1 in 500,000 adrenaline in normal saline was used, but it was found that the rate of drip required to maintain the blood-pressure was too fast. The strength of adrenaline now used is 1 in 250,000 in normal saline. This is easily ob-

tained by adding 2 c.cm. of 1 in 1,000 adrenaline to 500 c.cm. of normal saline. . . . I do not suggest that the technique is necessary for every spinal anaesthetic, but in conjunction with high spinal block it gives complete control of the patient's blood-pressure into the hands of the anaesthetist. . . . The use of adrenaline in this way adds to the margin of safety for the poor-risk patient." 6 references.

J. C. M. C.

CARD, W. I.; GRIFFITHS, W. J., AND MCSWINEY, B. A.: *Apparatus for Administering Oxygen.* Lancet 1: 177–179 (Feb. 5) 1944.

"In the course of investigations on the BLB apparatus, it was suggested by Card that the expiratory valve might be unnecessary, as experiments had shown that when one or more ports of the connecting device were open the expiratory valve was not essential. Attempts were made therefore to replace the connecting device by a rubber tube with a hole punched in it. Investigations were made with an apparatus consisting of a BLB nasal mask, a rubber tube which was connected by metal sleeves with the face-piece, and the reservoir-rebreathing bag. It was found by trial and error that if a hole was bored in a tube having a wall 3 mm. thick with a cork-borer of 7 mm. diameter, the arrangement was efficient: a high concentration of oxygen was obtained in alveolar air samples with a flow of 3 or more litres a minute, and the subject experienced no embarrassment in respiration. . . . In subsequent experiments the nasal mask was connected with the reservoir-rebreathing bag and a hole was bored with a cork-borer of 7 mm. diameter in the front of the face-piece just below the strap. It was thought at first that patients would object to this arrangement as the air drawn into the apparatus at the end of inspiration cools the face. The effect has proved, in some instances at least, to be of benefit, as the air tends to decrease sweating. . . . Clinical reports on these models have been very satisfactory. They have been found easy to handle and are well tolerated by the patients." 4 references.

J. C. M. C.

EPSTEIN, H. G.: *Removal of Ether Vapour during Anaesthesia.* Lancet 1: 114–116 (Jan. 22) 1944.

"The explosion hazard is always present when ether is used in the vicinity of electrical equipment or an open fire, and the risk increases if a number of successive operations are carried out in a small room without effective ventilation. Certain kinds of activated charcoal will remove ether vapour from the expired air, and adsorbers filled with this material have made and proved effective during long operations. In emergency, the canisters supplied with Service gas-masks can be adapted to the same purpose. . . . Ether vapour mixed with air or oxygen is explosive from 2 per cent upwards to about 25 per cent and 80 per cent respectively. Since the upper limits of the explosive range are of no interest to anaesthetists, the ether concentration must be reduced below the lower limit to prevent explosion. . . . Two adsorbers have been evolved on the basis of numerous laboratory and clinical experiments. The medium-capacity adsorber consists simply of a small container of elliptical cross-section, filled with 600 g. of activated charcoal. A variety of activated charcoals for gas-adsorption has proved suitable. . . . The resistance to breathing is appreciable, if the cross-section of the adsorber is not kept large. The compartment containing the charcoal is 16 cm. deep, with a cross-section of 60 sq. cm., and rests on a false bottom made of fine-mesh metal gauze. . . . A