STERILIZATION OF INTENSIVE CARE EQUIPMENT

Sir,—In the Intensive Care Unit at Whiston Hospital we sterilize our ventilators and some other equipment with 10 per cent ethylene oxide in carbon dioxide in a Neoprene-proofed Terylene bag by a method similar to that described by Bishop et al. (1964).

Enquiries from other groups starting to use similar methods have led us to record some of our practical problems and their solution.

Sterilization control.

We use Royce's sachets. These indicate that an adequate time concentration product has been achieved at an adequate temperature. Failure of the sachets to change colour indicates inefficient sterilization and may be due to:

- Undue dilution of the mixture with air in the bag or inside the ventilator. We try to avoid this by evacuating the bag with an efficient suction pump (Matburn) until it is drawn tightly down on to the ventilator before filling with gas.
- Insufficient time. The machine should be left to cycle inside the bag for a full 24 hours.
- Too low a temperature. It is useless to try to sterilize by this method in an unheated room or in the open in cold weather, although this might be thought desirable for the safe use of this toxic gas.
- Royce's sachets, since they contain an aqueous solution, take no account of humidity. This, however, does affect the process. The optimum relative humidity is from 30 to 60 per cent.

Extremely dry conditions or desiccation of articles to be sterilized renders the process useless. Since the gas mixture delivered to the bag is dry it is desirable to inject into the delivery tube a quantity of water calculated from the temperature and the volume of the bag. At 20°C, 5 ml of water are required to produce a relative humidity of 30 per cent in 27 cu.ft. of gas. Appropriate reduction may be made for residual air and the volume of articles to be sterilized.

Vaporization.

The mixture may issue from the cylinder in liquid form. It is therefore passed through a copper coil immersed in a bucket of hot water above 60°C. The connection between the cylinder and the coil will become very cold due to abstraction of latent heat of vaporization.

Rubber and plastic tubes become rigid and brittle and simple push-on connections cannot be relied upon. A positive all-metal connection between the cylinder and coil is desirable and may shortly become available from the British Oxygen Company.

Disposal of ethylene oxide.

We dispose of this toxic substance by evacuating the bag with a water operated suction pump. The effluent is passed through a tube out of a window directly to a ground floor outside drain. Ethylene oxide is soluble in water and is hydrolyzed to ethylene glycol in aqueous solution. No objection to this practice by the public health authorities has been encountered.

The cylinders should be stored and used in the upright position or a mixture of constant composition will not be obtained.

Viscous polymers tend to form in the cylinders if they are stored for long periods. They should be returned to the suppliers as soon as possible after use.

The Neoprene-proofed Terylene bag is obtainable from the R.F.D. Company Ltd., Godalming.

Royce's sachets are obtainable from Boots Pure Drug Co. Ltd.

The British Oxygen Company supply and refill the cylinders of 10 per cent ethylene oxide in carbon dioxide.

P. J. BOULTBEE
JOHN S. ROBINSON
R. LEACH
E. THOMAS

REFERENCES


NEUROLEPTANALGESICS: A COMPARISON OF THE CARDIOVASCULAR, RESPIRATORY AND METABOLIC EFFECTS OF INNOVAN AND THIOPENTONE PLUS METHOTR1MEPRAZINE

Sir,—In the November issue of this journal Dr. Dobkin and his co-workers (Brit. J. Anaesth., 1964, 36, 694) demonstrated that there is no difference between the neuroleptanalgesic combination, phentanyl-dihydrobenzperidol, and the combination, thiopentone-methotrimeprazine, with regard to their metabolic effects during anaesthesia.

Notwithstanding the comprehensiveness of their investigation I must seriously object to the conclusions drawn from these experiments. In the summary of their article it is stated that "both mixtures caused a moderate fall in blood pressure, a lowering of body temperature and a fall in the serum potassium. Other parameters did not change appreciably."

The effects on blood pressure, temperature and serum potassium level may be directly related to the hyperventilation performed and have nothing to do with the anaesthetics used in this experiment.

Furthermore, the most important parameter indicating the state of acid-base equilibrium, and, consequently, of any metabolic influence, is thrown out of the investigation I must seriously object to the conclusions drawn from these experiments. In the summary of their article it is stated that "both mixtures caused a moderate fall in blood pressure, a lowering of body temperature and a fall in the serum potassium. Other parameters did not change appreciably."

I wonder how the investigators expect to find minor deviations in the metabolic state after the plasma bicarbonate has been brought down to an unphysiological level of 12.2 m.mol/l! This is like demolishing a building by high explosives, and afterwards estimating the damage done by throwing pebbles into the ruins.