CORRESPONDENCE

THE HEAT MECHANICS OF THE WATERS CANISTER

Sir,—Dr. Ainley-Walker’s article, “The Heat Mechanics of the Waters Canister” (January 1949) is a welcome contribution to the literature on this method of CO₂ absorption. By its simplicity and low cost the Waters canister has retained its popularity in face of growing competition from the circle absorber.

However, one or two of the conclusions drawn may be misleading. For instance, the statement that “the temperature of the inspired gas rarely exceeds that of the patient” may be true at the ambient temperature in which this series of readings was made, 76°F. Such a generalization may not be valid if one is working in a temperature of 80–90°F, which may be the common experience of many readers, either through poorly designed theatres, climatic conditions, or both.

It would have been interesting if the author had compared his results with those of some American workers. Clark et al. (1954) using a “to and fro” system, found their average temperatures to be 116°F in the canister, and 102°F in the gases passing into the trachea from the tip of an endotracheal tube. Burstein and Mark (1948) found inspired temperatures in the region of 104–113°F, when room temperatures were above 85°F, and suggested the use of ice as a coolant.

Furthermore Dr. Ainley-Walker states that “no evidence has been found to suggest that the presence of a hot canister near the patient is in any way harmful, but rather the reverse”, even though one of his patients appears to have been inhaling gas at a temperature of approximately 42°C (107°F). What effects were actually looked for in those cases in which the inspired gas temperature was above that of the patient? It would seem necessary to include studies on bronchial dynamics, ciliary movement, intratracheal condensation of water vapour, etc., before drawing such a conclusion, even if no gross disturbance was manifest at the time of operation. Similarly, observations on the temperature of the patients would have been welcome.

Was the writer entirely satisfied with the performance of the canister in the matter of CO₂ absorption in the clinical experiments? Figures as to the inspired CO₂ concentration would have been useful in assessing this. Robson and Pask (1954) have shown how easily channelling can occur in the soda lime when the canister is lying on its side, with diminution of efficiency and consequent drop in heat production. Did Dr. Ainley-Walker use their suggested modification to ensure tight packing of the soda lime when the canister was lying horizontally?

Fortunately overheating effects can, to some extent, be offset by utilizing a high flow rate of gases and Dr. Ainley-Walker has shown a significant decrease in the temperature of the inspired gases when the flow was increased from 1.3 l. to 2 l. per minute. However, I have recorded a temperature of 110°F within a canister despite a flow of 4 l. when the room temperature was 84°F, which suggests that the heat loss by this route is limited, if in fact one is to utilize exhaled gases to any extent.

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REFERENCES


ACTION OF THE AZEOTROPIC MIXTURE

Sir,—When a new combination of drugs is introduced into anaesthesia, it is important that anaesthetists should not be unduly influenced by reports from the laboratory which may have little bearing in the clinical field, and which may contain conclusions not well founded. We have in mind the paper by Raventós and Dee (Brit. J. Anaesth. (1959), 31, 46), which appraises the value of the halothane-ether azeotropic mixture.

Having demonstrated that the small percentage of ether in the azeotrope contributes to its