

## LETTERS TO THE EDITOR

University Hospital,  
University of Saskatchewan,  
Saskatoon, Saskatchewan,  
January 16, 1961.

SIR:

I have read with great interest Dr. Michael Johnstone's paper on the azeotrope (CASJ 8(1):53 [Jan., 1961]). I have the highest respect for Dr. Johnstone and his impressive experience with halothane. Since we have administered at the University Hospital in Saskatoon well over 4,000 anaesthetics with the azeotrope and have done some experimental work as well, I feel, however, that I may be justified in taking issue with some of his remarks.

1. I believe it has been proven in the pages in this Journal (7(3): 297 [July, 1960]) that in clinical ranges the azeotrope vapour is non-flammable in both oxygen and air. If Dr. Johnstone has had the experience of a fire with this agent I can only assume that either the mixture used was not the azeotrope but contained an excess of diethyl ether or else that the concentration exceeded the limit of non-flammability. As for ignition of the liquid by static electricity this must be a small hazard indeed in a well-equipped and disciplined operating suite.

2. It has never been claimed that hypotension does not occur with the azeotrope. However, from our experimental work, it would appear quite clear that hypotension with the azeotrope is a sign of deep anaesthesia whereas equally profound hypotension can be produced with halothane in the presence of comparatively light planes of anaesthesia (CASJ 7(2):91 [April, 1960]). The peripheral stasis which Dr. Johnstone has observed is probably due to just that fact, namely, deep anaesthesia. We have managed to induce controlled hypotension of a moderate degree for prolonged periods of time with halothane/ether without circulatory ill-effects, where such hypotension was desirable from the surgical point of view.

With halothane, overdosage is relatively easily produced and avoidance requires the purchase of special vaporizers, whereas the contrary is true for the azeotrope as long as it is used with reasonable caution; this confers upon the azeotrope a safety factor not inherent with halothane. This greater safety factor matters little in Great Britain where the overwhelming majority of anaesthetics are administered by or under the supervision of highly skilled consultants, but it is of the very greatest importance in all those countries (and that includes Canada and the United States) where so much of the anaesthetic work is done by untrained or semi-trained personnel and where, if halothane were used widely by these people, a substantial increase in anaesthetic mortality might well result. It is the duty of teachers and leaders of the specialty to point the way to safer anaesthesia for all patients in all hands and not overly emphasize those agents and techniques which only the skilled can master with safety.

3. Lastly, I do not believe that Dr. Johnstone's experimental evidence is based on sound reasoning. I should have been more convinced if in an equal number of cases he had reversed the sequence of agents, preceding the administration of halothane by the azeotrope. I am not quite sure how much reliance one can place on data obtained from an experiment such as the one reported, since it is well known that all anaesthetics exert a certain amount of effect in sub-clinical doses and therefore it is proper to assume that at the time the azeotrope was administered, at least traces of halothane were still circulating in the patient and exerting what may well have been a synergistic effect.

GORDON M. WYANT, F.F.A.R.C.S.

State University of New York  
Upstate Medical Center  
Syracuse 10, N.Y.

SIR:

As one of the participants in the early clinical and laboratory studies of both halothane and the halothane-ether azeotrope, I believe that the current article by Dr. Johnstone, Evans, and Murphy (CASJ, Jan. 1961) deserves some comment, as it might leave the reader with some very gross misconceptions.

First, the authors do not seem to have a clear idea of what an azeotropic mixture is. Halothane and diethyl ether form an azeotropic mixture only when particular proportions are used (68.3 to 31.7 V/V halothane to ether) and is not "azeotropic in all proportions." The minor conflagration experienced by M.J. indicates either that he did not have *the azeotropic mixture* but probably one with excessive ether, excessive halothane, or else he was using an exceedingly high concentration—which should be necessary only rarely. If his mixture had excessive ether, he was probably administering a pure ether anaesthetic *in high concentration*.

Second, the entire design of his comparison of halothane-oxygen and the azeotrope-oxygen leaves so much to be desired that it is ludicrous to comment on the results he describes.

After working for several years with those who are not skilled in the administration of anaesthetics, a teacher may gain insight into which agents are easier (in a physiological-pharmacological sense) to administer. In my association with Professor Wyant, we were both impressed by the tendency of our trainees to prefer the *azeotropic mixture* to the use of halothane, but perhaps such consideration has no more merit than making a pronouncement after using any new anaesthetic agent twenty-one times *after having reached a deep anaesthetic state with another very potent agent (viz., halothane)*!

There are many ways of administering an anaesthetic, and the use of halothane-oxygen is only one of these. In very skilled hands, the outcome is usually satisfactory to the administrator as well as to the patient. In witnessing and partaking