When he was given morphine, 1/6 grain, he fell asleep. The nurse noted that while asleep and on oxygen, his color was pink. When he woke, the patient noticed blood on his gown and became excited. When the anesthesiologist arrived, the house staff was attempting artificial respiration on what appeared to be a moribund patient. The tracheotomy tube was removed and an endotracheal tube inserted. This improved respiration somewhat, but it was still inadequate. The patient was taken to the operating room for more powerful suction and for bronchoscopy. Force was required to remove the endotracheal tube because attached to it was a perfect cast of the trachea and the beginning of the main stem bronchi. This cast consisted of clotted blood and mucus. Immediately the patient improved, and he was sent back to his ward where his trachea now received meticulous care, and no more bouts of cyanosis occurred. He was discharged 27 days postoperatively.

CORRESPONDENCE

RESPONSES TO ANALGESICS AND PLACEBO—STATISTICAL ANALYSIS

To the Editor.—An error in the interpretation of the statistical analysis of our article entitled "The Effect of Analgesics on Radiant Heat Thresholds in Man" (ANESTHESIOLOGY **17**: 809 (Nov.–Dec.) 1956) has been brought to our attention separately by Drs. John Seed and C. V. Winder.

In particular the use of the second order interaction term (*Treatments* × *Times* × *Subjects*) as the error term is based upon the assumption of a "fixed constants" statistical model in the analysis of variance. This model does *not* allow generalization from the particular subjects utilized to the population of subjects from which they were drawn. The appropriate statistical model for such generalization is one utilizing "mixed constants." In this case the appropriate error term for treatment variation is the *Treatments* × *Subjects* first order interaction. Examination of our data utilizing this term for error reveals that variation among treatments or subjects is of substantially similar order of magnitude to the interaction thus negating the significance of the individual comparisons.

The arbitrary correction of control thresholds by subtraction of the 99 per cent confidence interval around the mean thresholds for a given day has also been questioned. Accordingly, we have reanalyzed the posttreatment data, subtracting the individual subject's control threshold on the given day. The basic statistical analysis follows:

A.V. Item	*d.F.*	S.S.	M.S.
Subjects (S)	5	1,988.413	398.68
Treatments (Tr)	9	6,306.435	700.72
Times (T)	4	2,119.964	529.99
S × Tr	44*	14,883.732	337.13
S × T	20	656.105	32.805
Tr × T	36	1,531.621	42.545
S × Tr × T	176*	5,399.930	30.681
	294	32,836.20	

* Adjusted for missing values.

Examination of this analysis reveals that the $S \times Tr$ interaction is highly significant as in the previous analysis, however the mean square for treatments is now substantially larger than its appropriate error term ($Tr \times S$ interaction) and is just not

significant at the 5 per cent level ($F = 2.078$ — F 5 per cent requires 2.1). Subdivision of the sum of squares for treatments into a comparison of pooled treatments versus pooled placebo yields a mean square of 2,904.15. This mean square is highly significant when compared with the $Tr \times S$ interaction ($F = 8.614$ — F 1 per cent requires 7.24). The pooled drug effect is therefore significantly greater than the placebo effect. The remaining 8 degrees of freedom for treatments yields a mean square of 425.3. This value is of the order of magnitude of the error term and therefore in the present experiment we are unable to differentiate among the various treatments. This analysis indicates that the conclusions previously drawn with respect to the relative effectiveness of the various treatments is not justified.

In summary, it would appear that the method, as utilized, is capable of revealing the effect of a drug in comparison to placebo but that in the present instance insufficient data are at hand to allow comparisons among the drugs and doses utilized.

In the light of our conjecture (p. 812), it is of interest that Batterman (Batterman, R. C.: Placebo and Non-reactors to Analgesics, Fed. Proc. **16**: 280, 1957) reports that 76 per cent of patients may respond or not respond on a given trial to analgesic or placebo medication.

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CARBON DIOXIDE ABSORBERS

To the Editor.—I notice in your recent issue (ANESTHESIOLOGY **18**: 339 (March–April) 1957) that Dr. H. H. Samson of Johannesburg, South Africa, has designed an apparatus to overcome the disadvantages of carbon dioxide absorbers "available until now."

He describes the device incorporating the circular wire mesh and spring to ensure compactness of the soda lime and prevention of channelling. With due respect to my colleague, I would like to point out that a similar device has been part of the Water's absorber as made by Heidbrink Division of Airco Corporation which I have been using here in Hong Kong since 1952. Absorption is very satisfactory although the canister itself is rather on the heavy side.

The plain Waters absorber has remained faithful all these years, and the same effect as Dr. Samson's modification can be obtained after the method of Robson and Pask (Brit. J. Anaesth. **26**: 333, 1954) by using an inexpensive nylon pot scraper against the soda lime.

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