CURRENT COMMENT

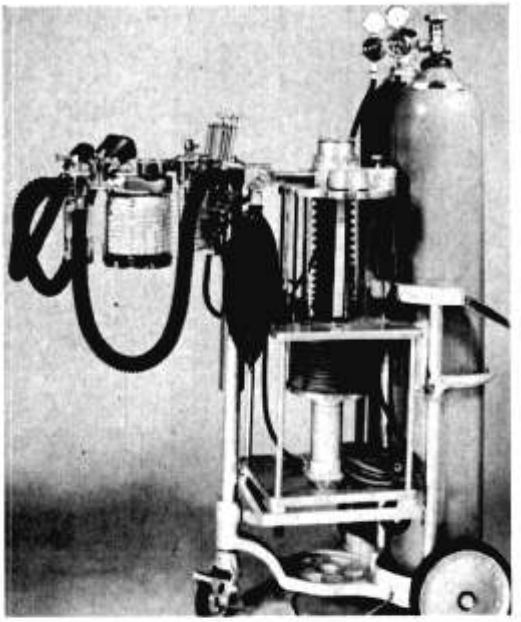
STUART C. CULLEN, *Editor*

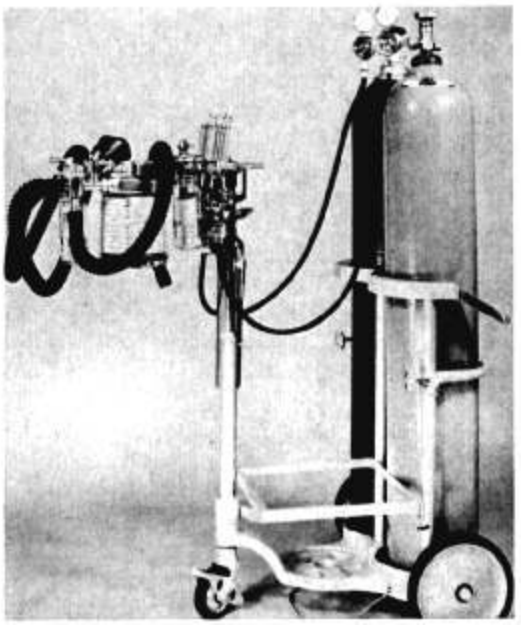
GADGET

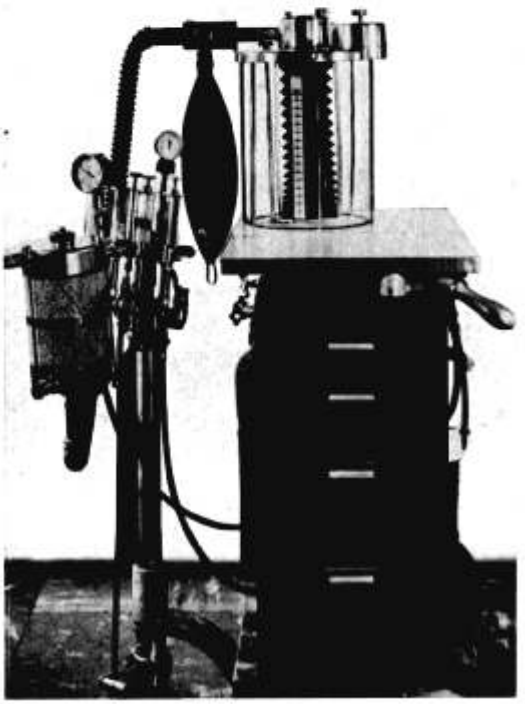
"Inboard" Mounting for the Jefferson Ventilator

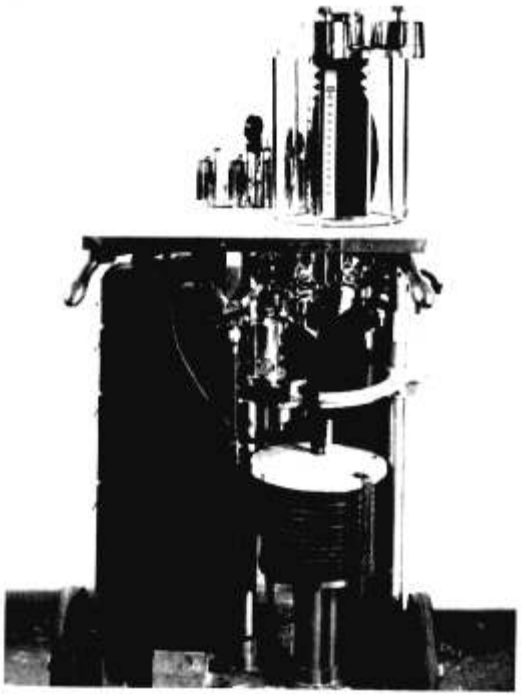
Dr. Richard N. Terry of Buffalo, New York has improvised a mounting within the framework of a standard gas machine for the Jefferson Ventilator. This mount has provided convenience, increased usefulness and a reduction in floor space required for anesthesia equipment.

One of the most disturbing shortcomings of the Jefferson Ventilator has been the contortions required for the operator to obtain the information provided by the bellows, hidden as they usually are in the darkened area below table level, and almost invariably behind the anesthetist. By placing the bellows in front of the anesthetist, at eye level, simultaneous observation of bellows movement and the patient's chest becomes possible. Changes in skeletal muscle tone occasioned by surgical manipulation are observed constantly rather than intermittently.









Space saving features are attractive in small operating rooms, or in large rooms crowded with monitoring equipment.

Two models are shown: a piped gas adaptation, and a simple mounting bracket for tank models. The mounting bracket permits a "lift in and out" arrangement without modification of the ventilator and is so simple that it can be fabricated by almost any hospital maintenance staff for two-dollars worth of material.

CASE REPORT

Complication of Anesthesia

Dr. Roger Westerlund, of Iowa City, Iowa, reports an interesting case which occurred recently at the University Hospitals. The indication for presenting this case is to emphasize the ever-present possibility of unforseen circumstances complicating the administration of anesthesia.

A 61-year-old white man was to have a transurethral inspection and possible resection of a recurrent bladder tumor. This patient had undergone this procedure more than 50 times since the diagnosis was established in 1938. His hospital record contained 31 anesthesia charts. He had received four general anesthetics of nitrous oxide-oxygen-thiopental. He had received 25 spinal anesthetics utilizing procaine, and two spinal anesthetics utilizing tetracaine. Prior to subarachnoid injections, on 15 occasions he had received a prophylactic dose of desoxy-ephedrine, and ephedrine on seven occasions. Each procedure was well tolerated and no anesthetic complications were recorded.

Prior to the procedure under discussion he appeared to be in his usual state of fair health. His blood pressure was 120/80, and he had no complaints or physical findings to suggest change in his physical status.

Spinal anesthesia was selected and on this occasion 8 mg. of metaraminol was injected intramuscularly as a prophylactic vasopressor. Procaine 150 mg., in 3 ml. of spinal fluid, was injected without difficulty into the subarachnoid space with the patient in the lateral position.

As the patient was turned into the supine position he suffered what appeared to be a clonic seizure associated with staring and gasping. This continued for about 10 seconds. Oxygen was administered immediately. No blood pressure or pulse was obtainable. The patient appeared quite pale, and his pupils were in midposition. The transition from a responsive, cooperative individual to an apparently dead one had occurred within seconds. No attempt at cardiac stimulation or massage was carried out.

Many possibilities of the cause of death were considered. A direct intravascular injection of the procaine might have occurred. This death could represent a severe hypersensitivity reaction in a man who had had at least 25 previous exposures to procaine. An acute vascular accident, either coronary or cerebral, was considered. Certainly a postmortem examination was necessary to attempt to find a cause of death.

The findings at autopsy consisted of: 1) recent posterolateral myocardial infarction; 2) rupture of the infarcted area of the ventricle; 3) hemopericardium with cardiac tamponade; and 4) other incidental findings not significant in the cause of death.

Thus the postmortem examination demonstrated a definite cause of death and so pre-

vented this case from becoming another indefinite hodge-podge of "clinical impressions." The processes and stresses contributing to the sudden death of this patient remain for speculation, but the mechanism of his death was made clear by postmortem study.

CORRESPONDENCE

Respiratory Arrest and Intraperitoneal Neomycin

To the Editor.—Regarding the letter concerning "Respiratory Arrest and Intraperitoneal Neomycin" by Dr. F. Gevers of Rotterdam (ANESTHESIOLOGY 21: 224, 1960), we would like to point out to Dr. Gevers that the closing sentence in our article on this subject (ANESTHESIOLOGY 20: 659, 1959) reads: "Relaxation to the surgeons' requirements would have to be achieved by some *regional procedure.*" On reading Dr. Gevers' case report (*Arch. Chir. Neerl.* 11: 356, 1959) we find that the patient (a 47-year-old woman in excellent condition), received 15 mg. *d*-tubocurarine during induction of anesthesia for a Billroth II and another 5 mg. when the surgeon complained, one hour and 20 minutes later. Though, according to the report, this amount of *d*-tubocurarine was not sufficient to render the patient apneic, she must have been fairly close to it as is evidenced by the fact that the intraperitoneal instillation of 10 ml, of a 10 per cent solution of neomycin did so within 10 minutes. Absorption of neomycin from the peritoneal cavity is very rapid and its clearance from the serum slow. Since *d*-tubocurarine is cleared from the circulation equally slowly we were surprised, not at the apena, but that the patient had recovered efficient spontaneous respiration in two hours. Perhaps this was due to the small amount of neomycin administered—for which the surgeon may be commended—and a pair of hard-working kidneys.

May we draw Dr. Gevers' attention to Pittinger, *et al.* (*Anesth. & Analg.* 37: 276, 1958) in which the synergism between neomycin and the muscle relaxants is well illustrated. This paper is included in his references but he seems to have missed the point.

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Respiratory Stimulants

To the Editor.—Dr. Adriani's editorial, "Respiratory Stimulants" was very refreshing. With a little editing, the word "vasopressors" could be substituted for the words "respiratory stimulants" and the editorial would be as true as in its original form.

Before completely discarding the respiratory stimulants, it is worth recalling the opening paragraph of Galen's "Treatise on Medical Experience:" [1]

"When I take as my standard the opinion held by the most skilful and wisest physicians and the best philosophers of the past, I say: 'The art of healing was originally invented and discovered by the logos in conjunction with experience.' And today also it can only be practised excellently and done well by one who employs both of these methods."

The Frederic Hewitt Lecture delivered at the Royal College of Surgeons of England, December 5, 1957, was entitled "Pseudo-science and Modern Anesthesia." [2] The speaker was M. D. Nosworthy, M.D., F.F.A.R.C.S. In the discussion of muscle relaxants, Dr. Nosworthy stated:

"Patients have, unfortunately, been kept in a state of apnea by too much carbon dioxide, but as a rule the lungs should be inflated with 5 per cent carbon dioxide for a minute or so with a view to offsetting any previous over-ventilation. If there is no quick respiratory response to this, I personally inject nikethamide intravenously, which has always had the desired effect—2 ml. are usually ample to shake up a muddled respiratory centre, but up to 5 ml. can be given in divided doses. Once spontaneous breathing has started I can assess the degree of residual curarization and act accordingly."

It would appear that Dr. Nosworthy has followed Galen's dictum regarding the use of "the logos in conjunction with experience." Dr. Nosworthy also used respiratory stimulants.

Perhaps phrases such as "shake up a muddled respiratory centre" or "give the brain a bit of a knock, you know" are not numbered in the "Standard Nomenclature of Diseases," but they convey a vivid impression. I must admit that on several occasions rather than carry on long palavers about "mixed blocks," CO_2 narcosis, hypocapnia, K shifts, Hering-Breuer reflex

exhaustion, etc., I have given, or caused to be given, small doses of nikethamide with salubrious effects. At times, even when scientific grounds are not available or the bandwagon is going the other way, one wonders if a bit of eclecticism is not warranted in clinical practice.

JOHN B. STETSON, M.D.
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REFERENCES

1. Walzer, R.: Galen on Medical Experience; First Ed. of the Arabic version with English Translation and Notes, London, Oxford University Press, 1946, p. 85.
2. Nosworthy, M. D.: Pseudo-science and modern anesthesia, Anaesthesia 13: 111, 1958. 1958.

Halothane Concentrations

To the Editor.—I believe the article by R. H. Smith and P. P. Volpitto (Halothane concentrations in clinical anesthesia, ANESTHESIOLOGY 21: 1, 1960) may be misleading. The halothane concentrations were measured in the inflowing gas mixture, not in the anesthetic system itself (which, I assume, was a circle or or to-and-fro system since four liters per minute total flow usually is not enough to maintain a nonrebreathing system unless respiratory depression is present). These inflowing concentrations may not be construed as representative of the concentrations within a system in which rebreathing occurs. The factors governing the concentration in such a system are far more numerous than the inflowing gas concentration alone. These factors include the volume per minute of the inflowing gas, the rate at which the gas is being taken up by the patient, the rate at which concomitant gases are being removed by the patient or the absorbing system, etc. In addition, the concentration of gas within the anesthetic system is not necessarily the equivalent of that within the alveoli, the latter again being dependent on a number of additional factors. These include alveolar ventilation, diffusion characteristics of the gas, gas solubility in blood and other tissues, cardiac output, etc.

The article, therefore, does not tell the reader what halothane concentration is required for anesthesia but only that concentration necessary in the inflowing gas under limited circumstances. The concentration of an agent required for anesthesia is defined by the concentration necessary in the alveoli to produce the signs of anesthesia. The concentration of an agent required for anesthesia cannot be defined by the concentration elsewhere since the wide variations possible make such a definition meaningless.

EDMOND I. EGER
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Correction

To the Editor.—I find that the names of two authors were omitted from the Work in Progress Abstract, "A Method of Indirect Blood Pressure Measurement During Cardiopulmonary Bypass." (ANESTHESIOLOGY, 21: 96, 1960) Would you please list the authors as follows:

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Nalda S. Thung, M.D.
Robert E. Robinson, III

D. W. EASTWOOD, M.D.
Charlottesville, Virginia