ethyl ether, and in only one patient were any of the irritative phenomena seen commonly with ether noted. A transient reduction in blood pressure occurred in most patients following glutethimide administration, and in six (10 per cent) the systolic pressure fell more than 40 mm. of mercury. Sixteen patients (27 per cent) complained of a burning type of pain in the arm during injection. In several patients a small area of thrombosis was noted at the site of injection 24 hours later.

An Application of Analog Computational Methods to Physiological Measurements. WILLIAM THORNTON, B.S., DAVID A. DAVIS, M.D., KENNETH SUGIOKA, M.D., AND CHARLES W. FOWLER, M.D. *Department of Anesthesiology, University of North Carolina, Chapel Hill, N. C.* The term "analog computer" often creates visions of enormous and complicated electronic machines. Actually the functional elements of computers which can add, multiply, integrate, differentiate and carry out other mathematical operations are quite straightforward. Complexity and size of these instruments are increased by the number of functions required of the instrument. The function of integration described here is performed by a relatively simple and mass-produced circuitry easily contained in a shoe box. Calculations on other functions which lend themselves to conversion into electrical impulses can be handled by equally simple operational amplifiers. Accuracy and stability of performance depend on the quality of instrumentation and hours or days of uncorrected operation are quite possible. One application of analog computational methods concerns the conversion of gas flow rates into volume. It is desirable to make accurate and immediate measurements of respiratory volumes in anesthetized patients without disturbing the anesthetizing technique or equipment. Previously this has been difficult, especially when employing a semiclosed technique, controlled or assisted breathing. It is easy to insert into an anesthesia circuit a differential pressure transducer of the screen or baffle-plate type. A baffle-plate type is used in these studies and through a low-pressure Statham transducer and strain-gauge coupler the flow rate pattern is displayed on a type A Offner Dynograph recording system. So far this is a standard method of recording flow rates. Next the voltage from the pen motor recording flow rate is applied to the integrating system, where summation into volume is accomplished and displayed on a second recording channel in a pattern identical to that produced by a spirometer. Calibration is carried out by the use of some convenient and known *volume* standard (spirometer). Linearity and accuracy exceed 95 per cent and the instrumentation is stable over a period of several hours. The transducers and recording systems were chosen by convenience but an absolutely stable recording system such as the Offner chopper amplifier is imperative. In these studies the only inherent defect in instrumentation noted is attributable to an asymmetrical baffle plate transducer. "Steady state" signals such as those offered by a continuous flow of gases (semiclosed system) or even the asymmetry of the transducer may be compensated for by the addition of a large capacitor between the flow rate amplifier and the integrator input. This introduces a small (1–2 per cent) error and may over a period of time necessitate resetting of the base line (accomplished by the flick of a switch) but does not introduce any appreciable error from cycle to cycle. Because a differential pressure transducer is used, measurements made under positive or positive-negative ventilation are quite accurate. Although tested only in the field of anesthesiology, applications of this system in other areas requiring measurements of respiratory volumes are quite feasible, as are other applications of analog computers in physiological measurements.

The Effect of Certain Anesthetic Agents and Techniques on the Twenty-Four Hour I-131 Uptake. WM. H. WRIGHT, MAJOR MC, AND ALAN D. RANDALL, CAPT. MC. *Madigan Army Hospital, Tacoma, Wash.* Thiobarbital has been used in the treatment of hyperthyroidism in humans and the effects of thiopental and thiamylal on the I-131 uptake have been studied in mice and compared with the effects of ether and cyclopropane. This study attempts to delineate the effect of thiopental, thiamylal, methitural, low spinal anesthesia