Waters canister with a pneumotachograph interposed between the absorber and a 2-liter rebreathing bag. The gas mixture was introduced through the tail of the bag. An aneroid manometer placed at the proximal end of the canister measured the airway pressure. Continuous CO_2 sampling was done through a microcatheter connected to an infrared CO_2 analyzer. End-expired CO_2, tidal and minute volumes were measured during spontaneous breathing before and after the procedure as well as during controlled respiration at chosen rates of 40 and 80/minute and pressures of 20 and 30 cm. H_2O. *Results:* During spontaneous breathing at a rate of 45/minute the end-expired CO_2 was 40 mm. Hg, the tidal volume, 27 cc. and the minute volume 1.3 l./minute; at a controlled rate of 40/minute with 20 cm. H_2O, the CO_2 was 28 mm. Hg, the tidal volume 42 cc. and minute volume 1.8 l./minute. At the same rate of 40/minute but a pressure of 30 cm. H_2O the CO_2 was 23 mm. Hg, the tidal volume 61 cc. and minute volume 2.37 l./minute. At a rate of 80/minute with a pressure of 20 cm. H_2O, the CO_2 was 27 mm. Hg, the tidal volume 35 cc. and minute volume 2.8 l./minute. At a similar rate of 80/minute with a pressure of 30 cm. H_2O the CO_2 was 21 mm. Hg, tidal volume 48 cc. and minute volume 3.82 l./minute. After surgical procedure with a spontaneous rate of 50/minute, the end-expired CO_2 was 32 mm. Hg, tidal volume 44 cc. and minute volume 2.3 l./minute. *Discussion:* According to adult standards, anesthetized infants breathing on their own in plane 2 of stage III cyclopropane anesthesia appear adequately ventilated. Yet in our group's past experience these infants rapidly develop cyanosis and accompanying signs if respiratory obstruction occurs. Controlled ventilation produced low P_{CO_2} values and large tidal volumes. The P_{CO_2} was decreased significantly when airway pressure was increased from 20 to 30 cm. H_2O. Doubling the rate did not lower P_{CO_2} significantly. Largest tidal volumes were obtained when airway pressure exerted was 30 cm. H_2O and a rate of 40/minute. At the same pressure, doubling the rate decreased the tidal volume significantly. Clinically the infants responded well to these low levels of P_{CO_2}.

Consideration of "Lost Gas" in Pressure Breathing Anesthesia. MEYER SAKLAD, M.D., AND FRANCIS J. CURRAN, M.D., *Department of Anesthesiology, Rhode Island Hospital, Providence, Rhode Island.* Until the advent of controlled and assisted respiration the excursion of the rebreathing bag had a direct and reasonably accurate relationship to tidal exchange. By intermittently elevating the pressure within the respiratory system in order to produce or aid respiration, the relationship between the gas volume which leaves the rebreathing bag may vary markedly from that which enters the patient's lungs. The tidal volume produced may be much less than the volume of gas expelled from the bag. The difference in these two volumes is termed "lost gas." This variation is due to both gas compression within the rigid portion of the pressure breathing device and both compression of the gas within and distention of the elastic portions of the apparatus. A gas machine and various types of gas machine components, as absorbers and rebreathing tubes, were studied. The more elastic the rebreathing tubes and the larger the capacity of the absorption unit and the rebreathing bag the greater is the amount of "lost gas." In a standard gas machine, with large-sized canister and the usual rebreathing tubes, the lost gas amounted to 420 cc. Under this set of circumstances the tidal volume of 400 cc. required the effective movement of 820 cc. of gas. The relationship between "lost gas" and tidal volume may vary between individuals, depending upon their size and within the same individual because of changing compliance and resistance. For a given apparatus "lost gas" volume varies but little but that of patients varies greatly. For children and smaller adults the lost gas may be several times that of the tidal exchange and in adults it may equal or be smaller than tidal volume. The "lost gas" is different for each apparatus. The larger the units or system, the greater is the "lost air" component. We believe that recognition of the amount of lost gas requires us to apply ourselves more directly to efforts to produce satisfactory tidal exchange and may hasten the day when it becomes possible to measure each tidal exchange on the patient end of a respiratory apparatus.