induction and maintenance with open-drop ether on a Schimmelbusch face mask designated as 'drop alone'; (2) short semiopen induction with nitrous oxide-oxygen for two to five minutes, followed by open-drop ether on a Schimmelbusch face mask, designated as 'nitrous oxide-oxygen to drop'; (3) short semiopen induction with nitrous oxide-oxygen followed by a closed system with ether dropping in a rebreathing bag; there was maintenance flow of oxygen, and soda lime absorption of carbon dioxide, designated as 'closed metric'; (4) semiopen induction with nitrous oxide-oxygen, followed by constant flow of nitrous oxide and oxygen over ether, designated as a 'semiopen N_2O–O_2 constant flow with ether.' Ethylene could not be used as an induction agent as it appeared in the blood samples, and was found to be present, although not quantitatively, in the analysis. . . . The selection of a standard level of anesthesia in an assay such as this is extremely difficult. . . .

"In this work we attempted to use the signs regularly employed in anesthesia, both because they represented a convenient and commonly accepted method and because of the greater familiarity of the anesthetists with these signs. Muscular relaxation, character of respiration, eye signs, and absence of superficial reflexes, as defined by Guedel, were employed as criteria of the depth of anesthesia. All blood samples were drawn at the second plane of the third or surgical stage of anesthesia. These were taken after the induction and before the operation was begun and after careful selection of the anesthetic stage by one of three experienced anesthetists. The subsequent course of the anesthetic was checked, and in cases where it was apparent that the stage had been incorrectly designated, the samples were rejected. . . . Because the samples were always taken under comparable conditions, after smooth inductions and at apparently the same stage of anesthesia, and because the ether administration was stopped during the time of determination of the stage and drawing of the sample, it is fair to state that the samples are of clinical value, and if not representing a state of equilibrium, at least are close to it. . . .

"From this series a number of observations may be made. The premedication used had little effect on the time required for the production of surgical anesthesia or on the amount of ether used. Certainly the medication did not markedly shorten the induction period; in fact, there was a slight increase in the induction time. . . . There was a wider divergence in blood ether levels in the presence of premedication. This is probably due in part to the obscuring of some of the anesthetic signs, since more difficulty was experienced in determining exactly the anesthetic stage after premedication. . . . Comparison by graphic and statistical methods reveals that patients without premedication, or with commonly used premedication, show no significant variation in blood ether levels at the second plane of third stage anesthesia. Morphine in the dosages commonly employed does not appreciably decrease the time of, nor increase the ease of, induction with ether and often obscures the signs of anesthesia so that frequently higher ether levels are found after its use. Blood ether levels without premedication at the second plane of the third stage of anesthesia vary from 50 to 130 mg. per cent, the greatest number falling between 80 and 100 mg. per cent." 29 references.

J. C. M. C.

BURGEN, A. S., AND SCHOFIELD, E.: *Dental Anaesthesia and Oxygen Lack.* Brit. Dent. J. 71: 303–306 (Nov.) 1941.

"Experiments . . . were originally

carried out to determine the effect on the composition of the inspired gases of the long connecting tube and nosepiece tubes usually employed in dental anesthesia. It was thought that the additional dead space thus produced would considerably lower the oxygen content of the inspired gas when rebreathing was taking place. During the investigations, however, other important facts emerged.

"These were: (1) That resistance of the narrow nosepiece tubes had important effects on respiration by impeding respiratory movements. (2) That owing to hyperventilation, due to the increased resistance, acapnia tends to develop. (3) That the percentage of oxygen inhaled during the average gas-oxygen anaesthesia in unpremedicated dental patients is so low that this form of anaesthesia used for more than two or three minutes is physiologically unsound; the alkalaemic tendency produced by (2) further reducing oxygen availability. In view of the fact that prolonged gas-oxygen anaesthesia is being used increasingly by dentists this last point is of great importance. . . .

"We would suggest that: (1) Nasal gas-oxygen should never be used for procedures lasting more than five minutes, without the addition of ether or vinesthene and a higher oxygen content or alternatively after premedication with morphia or a barbiturate. (2) Carbon dioxide should be added to gas-oxygen mixtures or failing this efficient partial rebreathing should be used for all patients except those with a low alkali reserve. This will combat the acapnia and help to diminsh any harmful effects of the low oxygen tensions. (3) All tubes leading from the gas machine to the nosepiece should be of wide bore to eliminate the resistance to the flow of gases. Theoretically no tube or orifice in the nosepiece should be smaller in calibre than the trachea. Further these tubes should be arranged as a circuit with the inspiratory gases passing up one tube and expiratory gases down the other in order to eliminate the artificial increase of dead space which would be considerably more marked with wide bore tubes than the present narrow ones."

J. C. M. C.

WINDLE, W. F., AND BECKER, R. F.: *Role of Carbon Dioxide in Resuscitation at Birth After Asphyxia and After Nembutal Anesthesia: An Experimental Study in the Cat and Guinea Pig.* Am. J. Obst. & Gynec. 42: 852–858 (Nov.) 1941.

"The observations to be reported are part of a broader study of the physiology of respiration in the fetus and newborn. No attempt will be made to correlate the dosages of nembutal we have used with those commonly or uncommonly employed in the human being. . . . Last year Dr. Yandell Henderson . . . suggested anarchapnea, containing the Greek roots 'archon' (governor) and 'pneuma' (breath), to indicate a state of uncontrolled respiration encountered after excessive use of certain narcotic drugs, notably the barbiturates. The government of respiration by carbon dioxide appears to be abolished in deep barbiturate narcosis. The responsiveness of the respiratory center is lowered, the volume of breathing diminishes, hypercapnia manifesting itself as carbon dioxide displaces oxygen in lung alveoli, and anoxia ensues. The use of carbon dioxide diluted in oxygen for resuscitation in asphyxia of the newborn has been debated for some years. . . . We have studied intrauterine respiratory activities in several hundred fetuses of several species during the last few years. Respiration at birth under normal and asphyxial conditions has engaged our attention in at least 50 litters of kittens and guinea pigs. The effects on the fetus of nembutal admin-