a single inspiration of active gas, the relative ventilation and blood flow of the regions has been assessed. This technique has the advantages in that it does not require local anesthesia or tracheal or bronchial intubation. It is also rapidly repeatable. (*Dyson, N. A., and others: Studies of Regional Lung Function Using Radioactive Oxygen, Brit. M. J. 1: 231 (Jan. 23) 1960.*)

ARTIFICIAL RESPIRATION Direct mouth-to-mouth artificial respiration is by far the best and most efficient method in an emergency. Most teachers, however, find it unsatisfactory to demonstrate because of esthetic objections, the fear of infection, and the difficulty in demonstrating it to lay people and rescue teams. A new airway device which includes a plastic Guedel airway, a flexible neck containing a brass bite-block, and a mouth guard is described. A vinyl plastic unidirectional valve assembly is inserted into the flexible neck. This assembly is known as the Brook airway. (*Dobkin, A. B.: Direct Artificial Respiration Training with the Brook Airway, Lancet 2: 662 (Oct. 24) 1959.*)

RESPIRATION An analysis of the mechanisms of respiratory failure falls into three zones of respiratory function. The ventilatory zone is concerned with the maintenance of the alveolar gas tensions. The diffusion zone concerns the passage of oxygen and carbon dioxide across the thin layer of fluid and endothelium which separates alveolar gas and capillary blood. The perfusion zone consists in the flow and pressure of the pulmonary circulation. The diseases that impair respiration can be grouped into similar categories. The principal structural effects of respiratory disease are airway obstruction, stiffening of the lungs, and reduction of the pulmonary vascular bed. The principal functional effects of respiratory disease are arterial unsaturation of oxygen, carbon dioxide retention, retention of sodium bicarbonate, and pulmonary hypertension. (*Arnott, W. M.: Respiratory Failure, Lancet 1: 1 (Jan. 2) 1960.*)

POSITIVE PRESSURE BREATHING Intermittent positive-pressure breathing with peak pressures of 20 cm. of water produced slight but definite decrease in cardiac output in patients with advanced pulmonary emphysema. The changes observed should be well tolerated by most patients. (*Cathcart, R. T., and others: Effect of Intermittent Positive Pressure Breathing on the Cardiac Output of Patients with Chronic Pulmonary Disease, Dis. Chest 37: 222 (Feb.) 1960.*)

TRANSTRACHEAL RESUSCITATION A transtracheal needle may be better than no airway at all and may under certain circumstances be useful (as in the very small infant, the largest needle being used). It probably cannot provide adequate ventilation in the spontaneously breathing person without extremely exhausting effort on the part of the patient. If the only aim is to provide diffusion respiration it is possible to supply an adequate amount of oxygen, but if high flow rates are used, dangerous pressures are necessary. In the rare situation in which the upper airway is totally obstructed, distention and rupture of the lungs appear real possibilities. It is believed that the technique of transtracheal resuscitation with a needle may delay the establishment of an adequate airway (which would be established better either with an endotracheal tube or via a tracheostomy) and in addition provide a false sense of security. In any event its usefulness for diffusion respiration rather than for to-and-fro respiration should be fully appreciated by persons employing the transtracheal needle for resuscitation of obstructed patients. (*Bougas, T. P., and Cook, C. D.: Pressure-Flow Characteristics of Needles Suggested for Transtracheal Resuscitation, N. E. J. Med. 262: 511 (March 10) 1960.*)

RESPIRATORY INSUFFICIENCY Administration of a new carbonic anyhydrase inhibitor, dichlorphenamide, in 15 patients with respiratory insufficiency, produced clinical improvement in all but one. In most cases, marked improvement in arterial blood gas tension was associated with an increased alveolar ventilation. Such improvement appeared to be sustained during prolonged administration of the drug. (*Namark, A., and others: The Effect of a New Carbonic Anhydrase Inhibitor (Dichlorphenamide) in*

Respiratory Insufficiency, Amer. J. of Med. 28: 368 (March) 1960.)

ALTITUDE The exposure of dogs to a simulated altitude of 30,000 feet for 30 minutes resulted in marked respiratory alkalosis and hypokalemia. Blood *p*H rose from an initial level of 7.46 to 7.71 after three and one-half minutes of exposure to altitude. While the potassium levels were decreasing, glucose levels were increasing simultaneously during exposure to altitude. (*Gold, A. J., Barry, J. Q., and Ferguson, F. P.: Early Effect of Moderate Altitude Stress on Plasma Potassium in the Dog, J. Appl. Phsyiol. 15: 37 (Jan.) 1960.*)

DRUG EVALUATION A system was devised combining means of 1) automatic sampling of end-tidal gas; 2) rapid analysis of samples of gas for carbon dioxide concentration; and 3) manual or automatic modification of percent carbon dioxide in succeeding inspirations to permit maintenance of alveolar P_{CO_2} at desired levels above the carbon dioxide tension natural for a particular experimental situation. By imposing a fixed, elevated alveolar P_{CO_2} upon a subject, effects of drugs or physiological stresses upon carbon dioxide-sensitive functions can be evaluated, unmasked by the compensatory alterations of alveolar and arterial P_{CO_2} which normally result from changes in alveolar ventilation or metabolism. This method was first used in the study of meperidine—on the rate of onset, time of peak effect, and rate of disappearance of its action on respiration. (*Lambertsen, C. J., and Wendel, H.: An Alveolar P_{CO_2} Control System: Its Use to Magnify Respiratory Depression by Meperidine, J. Appl. Physiol. 15: 43 (Jan.) 1960.*)

THERMO HOMEOSTASIS Human experiments were done to test the thermal homeostasis of the alveolar-capillary structures. The human alveolar temperature was virtually constant even though under the most extreme thermal conditions. The entire heat exchange and vaporization does not take place in the alveoli. (*Rubenstein, E., Pardee, R. C., and Eldridge, F.: Alveolar-Capillary Temperature, J. Appl. Physiol. 15: 10 (Jan.) 1960.*)

HYPOTHERMIA In induced hypothermia the following changes have been observed: a reduction in the amount of circulating hemoglobin, a decrease in the number of platelets and white blood cells, and a decrease in the plasma concentration of fibrinogen. These changes seem to be correlated with the occurrence of intravascular aggregation of red blood cells which is promoted by an increase in concentration of plasma proteins and an increased concentration of erythrocytes. This intravascular aggregation by hypothermia, which produces an impaired nutritive blood flow in animals and may cause myocardial hypoxia, may be prevented by infusions of low molecular weight (25,000 to 40,000) dextran. (*Lofstrom, B.: Induced Hypothermia and Intravascular Aggregation, Acta Anesthesiologica Scandinavica Supplement III, 1959.*)

HYPOTHERMIA Standardized brain injuries were produced in dogs by the application of liquid nitrogen to the surgically exposed dura mater and subjacent brain. Hypothermia (25 C.) induced within three hours after such injury would protect against mortality. If temperature were not reduced or not reduced sufficiently early after injury death would result. No relationship between the degree of cerebral edema observed and mortality could be determined. (*Rosomoff, H. L., and others: Experimental Brain Injury and Delayed Hypothermia, Surg. Gynec. & Obst. 110: 27 (Jan.) 1960.*)

SELECTIVE HYPOTHERMIA Selective local hypothermia of the heart (pouring saline at 0 to 5 C. into the pericardial sac) permits at least one hour of cardiac anoxia in the dog during cardiopulmonary bypass with the remainder of the blood at normal body temperature. This technique avoids the disadvantages of potassium arrest or coronary influsion with cold blood, yet it provides a dry, quiet heart for prolonged periods. The technic has been used in 13 dogs with death occurring in only one. (*Shumway, N. E., Lower, R. R., and Stofer, R. C.: Selective Hypothermia of the Heart in Anoxic Cardiac Arrest, Surg. Gynec. & Obst. 109: 750 (Dec.) 1959.*)