Respiration

LUNG IRRADIATION Cardiopulmonary function was assessed in 41 dogs by means of combined right and left heart catheterization and measurements of blood gas exchange before, during, and after positive-pressure breathing and electrically-induced simulated exercise. Thirty-three dogs received 2,000 to 5,000 roentgens of irradiation to the lungs, while eight dogs served as controls. Irradiation localized to the lung resulted in a syndrome of progressive and irreversible pulmonary dysfunction, characterized by impaired alveolar-arterial gas exchange, pulmonary hypertension, and obliteration of the pulmonary vascular bed. (*Schreiner, B. F., Jr., and others: Effects of Thoracic Irradiation upon Cardiopulmonary Function in the Dog, Amer. Rev. Resp. Dis. 99: 205 (Feb.) 1969.*)

CO_2 RESPONSE IN ASTHMA The ventilatory response to increasing end-tidal carbon dioxide tension ($P_{A_{CO_2}}$) during four minutes of rebreathing from a bag containing approximately four liters of oxygen was studied in 11 control subjects and nine asthmatic patients. The asthmatic patients, when breathing room air, had greater ventilation than the control subjects. Mean $P_{A_{CO_2}}$ was lower in the asthmatic patients than in the control subjects at the start of the experiment. After a slight decrease in the first minute of rebreathing, the mean CO_2 response slope of the asthmatic patients was greater than that of the control subjects. This was particularly noticeable when the $P_{A_{CO_2}}$ was more than 50 mm Hg. (*Tandon, M. K.: Ventilatory Responses to Carbon Dioxide in Bronchial Asthma, Amer. Rev. Resp. Dis. 99: 415 (March) 1969.*)

ASTHMA A new bronchodilator drug, salbutamol, reduced airway obstruction when given by aerosol to 37 patients with moderate bronchial asthma, but did not cause a concomitant reduction in arterial oxygen tension. Other beta-adrenergic stimulants effective as bronchodilators may also cause pulmonary vasodilation, increase in cardiac output and worsening of hypoxemia by aggravating the existing ventilation/perfusion disturbance. (*Palmer, K. N. V., and others: Effect of Salbutamol on Spirometry and Blood-gas Tensions in Bronchial Asthma, Brit. Med. J. 1: 31 (Jan.) 1969.*)

MUCOCILIARY FUNCTION A new technique for the study of nasal mucociliary flow was used in 46 healthy subjects and seven subjects who had undergone laryngectomy. The method involves the use of a gamma-scintillation camera for external detection of a single, small tagged particle placed on the nasal mucosa. The average flow rates were 7 mm/min in the healthy subjects and 8 mm/min in the laryngectomy group. (*Quinlan, M. F., and others: Measurement of Mucociliary Function in Man, Amer. Rev. Resp. Dis. 99: 13 (Jan.) 1969.*)

CHRONIC HYPERCAPNIA Laboratory analyses of blood and urine of 20 patients with stable CO_2 values ranging from 34 to 103 mm Hg were done. No patient studied had any apparent complicating disorder. The data were used to characterize the whole-body CO_2 titration in chronic uncomplicated hypercapnia. A linear increase in estimated hydrogen-ion activity was found as CO_2 increased. Over this CO_2 range, the arterial blood hydrogen-ion activity increased by 0.24 nM/l/mm Hg increased in CO_2 tension. The physiologic response to chronic hypercapnia in man was defined by a zone that was about 11 nM/l (0.1 *p*H unit) wide for hydrogen ion and 10 mEq wide for bicarbonate. These significance bands may be used to separate mixed acid–base disorders in patients with chronic hypercapnia. (*Brackett, N. C., Jr., and others: Acid–Base Response to Chronic Hypercapnia in Man, New Engl. J. Med. 280: 124 (Jan.) 1969.*)

HYPERBAROXIA AND NEGATIVE INOTROPISM Several indices of myocardial contractility were measured in anesthetized dogs at constant ventricular rate after surgical induction of a complete atrioventricular block. At 3.6 atmospheres, with an average arterial P_{O_2} of 2,372 mm Hg, stroke volume and stroke work decreased, suggesting a decrease in myocardial contractility. A direct toxic action upon intracellular metabo-