

veolar oxygen tension increased from 100 to 174 mm. of mercury but did not increase further up to an alveolar oxygen tension of 526 mm. of mercury. Further increase of $P_{A_{O_2}}$ to 651 mm. of mercury caused a significant decrease in $\lambda\text{-}aD_{O_2}$. Magnitude of $\lambda\text{-}aD_{O_2}$ measured was in good agreement with those previously reported. The results could be partially explained by postulating the existence of a small lung compartment in which alveoli are open and non-ventilated but still perfused (ventilation-perfusion ratio = 0). The possibility was also considered that the anatomical shunt effectively diminishes when pure oxygen is breathed. (Cole, R. B., and Bishop, J. M.: *Variation in Alveolar-Arterial O_2 Tension Differences at High Levels of Alevolar O_2 Tension*, *J. Appl. Physiol.* 22: 685 (April) 1967.)

PULMONARY FUNCTION Topographical distribution of inspired gas in excised lobes of dogs' lungs was evaluated by scanning lungs inflated with radioactive xenon starting from various preinspiratory volumes. Distribution of inspired gas was substantially uniform throughout lobes, but small differences were observed between upper and lower lobes. These differences were attributed to varying elastic properties between lobes. Although uneven ventilation in intact dogs is attributable primarily to regional differences in pleural pressure, variations in elastic properties between upper and lower lobes are of sufficient magnitude to be of significance. Other studies have suggested that in man, differences in elastic properties between upper and lower lobes must be either absent or too small to be detected by the methods used. (Faridy, E. E., Kidd, R., and Miltic-Emili, J.: *Topographical Distribution of Inspired Gas in Excised Lobes of Dogs*, *J. Appl. Physiol.* 22: 760 (April) 1967.)

VENTILATION Ventilation while breathing air was compared with ventilation while breathing oxygen in 12 obese subjects. During oxygen breathing, minute ventilation fell 28 per cent as a result of a fall in both tidal volume and respiratory rate while oxygen uptake increased. Arterial blood gas determinations revealed moderate desaturation (86 per

cent saturation) breathing air that was partially corrected by 100 per cent oxygen. The decrease in minute volume is probably due to decreased sensitivity of the respiratory center. (Leiner, A. C., and others: *Ventilatory Changes in Obese Persons During Oxygen Breathing*, *Amer. J. Med. Sci.* 253: 425 (April) 1967.)

PULMONARY FUNCTION Pulmonary function by routine tests and regional ventilation and perfusion distribution by radioactive xenon techniques was studied in seated obese patients. In subjects whose expiratory reserve volume averaged 49 per cent of predicted normal, the ventilation distribution was normal. In those with expiratory reserve volumes of less than 400 ml., the distribution of a normal tidal breath was predominantly to the upper zones. In all subjects the perfusion distribution was predominantly to the lower lung zones, but was slightly more uniform than in normal non-obese subjects. These findings indicate significant ventilation-perfusion abnormality on a regional basis in obese subjects. This abnormality bears a close relation to the reduction in expiratory reserve volume, a finding predictable from recently published data on normal non-obese subjects. The abnormalities were of sufficient magnitude to cause a reduction in arterial oxygen tension during resting tidal ventilation. (Holly, H. S., and others: *Regional Distribution of Pulmonary Ventilation and Perfusion in Obesity*, *J. Clin. Invest.* 46: 475 (April) 1967.)

PULMONARY MECHANICS Lung tissue resistance during spontaneous breathing was on an average about 4 times higher in patients with lung fibrosis than in healthy persons of the same age. No significant difference in airway resistance was found. Lung tissue resistance during spontaneous breathing was much greater than during panting. There is an inverse correlation between vital capacity, or compliance, and lung tissue resistance in both groups of patients. Nevertheless, in patients with lung fibrosis, lung tissue resistance was increased to a greater degree than could be attributed to the loss of normally compliant lung tissue alone. There was no correlation between lung tissue resistance and severity of impairment of pulmonary gas exchange.

(Bachofen, J., and Scherrer, M.: *Lung Tissue in Diffuse Interstitial Pulmonary Fibrosis, J. Clin. Invest.* 46: 133 (Jan.) 1967.)

EMPHYSEMA Three methods were used to measure total lung capacity (TLC) in normal subjects and in subjects with obstructive airway disease. The three methods were (1) estimation from chest roentgenogram, (2) helium dilution, and (3) body plethysmograph. In the normal subjects, no difference was found in TLC among the three methods. In the emphysematous subjects the TLC as found with the helium dilution method was significantly lower than the TLC as found with the roentgenologic estimation or body plethysmograph. It is felt that the roentgenologic method of estimating TLC is as accurate in normal and emphysematous subjects as the best physiological method available and should be used for large scale screening studies for emphysema. (Niklaus, T. M., and others: *Roentgenologic, Physiologic, and Structural Estimations of the Total Lung Capacity in Normal and Emphysematous Subjects, Amer. J. Med.* 42: 547 (April) 1967.)

BRONCHIAL ASTHMA During acute attacks of asthma in 15 patients, arterial hypoxemia developed from a disturbance in ventilation-perfusion ratio. Bronchodilator therapy did not improve the hypoxemia, perhaps because the agent used only accentuated the already existing uneven ventilation-perfusion relationship. All subjects improved with steroid therapy and the subjective improvement paralleled the decrease in arterial hypoxemia but not necessarily the change in expiratory flow with forced expiration. (Vaddell, J. A., and others: *Hypoxia in Bronchial Asthma, Brit. Med. J.* 1: 402 (May) 1967.)

CORTICOSTEROIDS AND CROUP

The value of corticosteroids in the treatment of acute croup remains in doubt. There has been little documented evidence proving the effectiveness of corticosteroids in the treatment of croup. In a recent controlled, double-blind study, Eden and Larkin found no demonstrable difference between the effect of a placebo and methylprednisolone. Sussman studied a group of children with obstructive respiratory

tract infection, and in the few cases of croup included, could not alter their clinical course with the use of dexamethasone. Despite the lack of proof of effectiveness, many pediatricians and otolaryngologists advocate the routine use of steroids in the treatment of croup. These proponents believe that the anti-inflammatory action reduces edema and exudate around the larynx and helps maintain an adequate airway, thus reducing the incidence of tracheostomy or respiratory failure or both. The present investigation was undertaken to obtain more data on this subject. Fifty patients hospitalized in acute respiratory distress presenting with hoarseness, inspiratory stridor and barking cough were found to be comparable. No statistically significant difference in response between the control group and the group treated with dexamethasone could be demonstrated. The crucial question still remains: Does the use of corticosteroids in the more fulminating case of croup result in a more favorable outcome? (Eden, A. N., and others: *Corticosteroids and Croup, J.A.M.A.* 200: 403 (May) 1967.)

RESPIRATORY FAILURE To determine the feasibility of parabiosis as a means of prolonged support in severe respiratory insufficiency, 20 cross-circulation experiments were performed in which the recipient dog was allowed to breathe spontaneously 5 to 10 per cent oxygen in nitrogen. Arteriovenous blood exchange between the parabiotic pair was effected with a double ventricle pump at flow rates of 10 to 29 ml./minute/kg. The duration of cross-circulation varied from 2 to 40 hours with a recipient survival rate of 65 per cent. All donor animals survived. The arterial pH and P_{O_2} generally stabilized within one hour after the onset of cross-circulation in those experiments characterized by recipient survival. At blood flow rates above 20 ml./minute/kg., the oxygen saturations of the recipients' arterial blood approximated the saturation of normal venous blood. The recipients' arterial blood lactate showed an initial small increase but then remained stable throughout the period of cross-circulation. (Bryant, L. R., and others: *Prolonged Cross-Circulation for Reversible Pulmonary Failure, Surgery* 61: 932 (June) 1967.)