slowly, neither hypotension nor hemodilution occurred until 25 per cent of the blood volume was removed. Slow removal of 35 per cent of the blood volume caused only minor blood pressure change and only slight hemodilution. It is concluded that hemodilution is influenced more by arterial blood pressure than by the volume of blood lost. (*Jenkins, D., and others: Experimental Hemorrhage, A. M. A. Arch. Surg. 82: 49 (Jan.) 1961.*)

BRAIN BLOOD FLOW Niacinamide in 3–5 Gm. doses administered intravenously in dogs produced a significant increase in cerebral blood flow and cerebral oxygen consumption but decreased mean arterial blood pressure and cerebral vascular resistance in dogs. The increase in cerebral blood flow is believed to be due to an increase in cardiac output associated with a decrease in cerebral vascular resistance. (*Huang, T. F., and Chao, C. C.: Effect of Niacinamide on Cerebral Circulation, Proc. Soc. Exp. Biol. Med. 105: 551 (Dec.) 1960.*)

ARM BLOOD FLOW Intravenous injection of mephentermine in normal man produces a decrease in blood flow in the forearm and an increase in blood pressure. Venous pressure increases while forearm venous distensibility and venous volume decreases. Experiments indicate the mephentermine increases both peripheral resistance and venous tone in man. (*Horsley, A. W., and Eckstein, J. W.: Effect of Mephentermine on Venomotor Tone, Blood Flow and Arterial Pressure in Forearm of Man, Proc. Soc. Exp. Biol. Med. 105: 569 (Dec.) 1960.*)

PHYSIOLOGIC MEASUREMENTS Measurement error is defined as the instantaneous difference between the value of the physiological event being measured and the value indicated by the recording system. The measurement errors associated with each of the three major components of a recording system, the transducer, amplifier and recorder, are discussed in detail. Since a pressure measuring system may be thought of as the analog of many other physiologic systems, the problem of pressure recording is treated in detail. A fluid-filled probe leading to a transducer chamber is assumed to have distributed physical properties. This system is shown to have inherent measurement errors related to: (1) multiple reflection of waves transmitted along the probe, (2) amplitude and phase distortion of waves transmitted along the probe, and (3) errors related to the generation of noise in such a system. A mathematical expression is developed indicating under what circumstances one might expect the behavior of the distributed probe system to approximate the behavior of the simple, single degree of freedom system. Since many physiologic recording systems approach the behavior of a single degree of freedom system, considerable discussion is devoted to a rather complete set of formulas describing the behavior of such a system with the hope that they be useful in determining the dynamic accuracy of a pressure recording system. (*Fry, D. L.: Physiologic Recording By Modern Instruments with Particular Reference to Pressure Recording, Physiol. Rev. 40: 753 (Oct.) 1960.*)

PULMONARY VASCULAR RESISTANCE In an open-chest dog, pulmonary vascular resistance was usually only slightly greater when the lung was collapsed than during moderate states of inflation. At higher levels of inflation pulmonary vascular resistance increased. At any given state of inflation pulmonary vascular resistance decreased as pulmonary artery pressure and pulmonary blood flow increased. Regional decreases in blood flow occurring in atelectatic portions of the lung could not be explained by mechanical factors alone. The increased pulmonary vascular resistance at high levels of lung inflation was due to the effect of transpulmonary pressure on the vessels surrounding the alveoli. (*Whittenberger, J., and others: Influence of State of Inflation of Lung on Pulmonary Vascular Resistance, J. Appl. Physiol. 15: 878 (Sept.) 1960.*)

CHEMORECEPTORS Dogs anesthetized with chloralose and urethane following morphine premedication were made hypoxic by substituting 7 to 12 per cent oxygen in nitrogen for room air. With the carotid body perfused from the same animal, systemic hypoxia usually caused an increase in respiratory minute volume, tachycardia, increase in cardiac output and reduction in total peripheral vascular resistance. When the carotid body perfusate was changed from hypoxic recipient blood to oxygenated donor blood, while the recipient animal continued to breathe the low-oxygen mixture, the result was a reduction in respiratory minute volume, further increase in heart rate and cardiac output and decrease in total peripheral resistance. When hypoxic blood perfusion of the carotid body was reestablished these effects were reversed. These results indicated that the cardiovascular effects of systemic hypoxia cannot be attributed to stimulation of chemoreceptors. The mechanism responsible for the cardio-vascular effects observed in systemic hypoxia remain obscure. (*Daly, M. D., and Scott, M. J.: Role of Chemoreceptors in Cardiovascular Responses to Systemic Hypoxia in Dog, J. Physiol. 154: 6P (Nov.) 1960.*)

PULMONARY CAPILLARY VOLUME Hypercarbia produced by inhalation of carbon dioxide-enriched gas mixtures caused an increase in the diffusing capacity of the lung (D_L) of 5 per cent when 10 per cent carbon dioxide was added to the mixture used in determining D_L and of 24 per cent when 7.5 per cent carbon dioxide was breathed for ten minutes before the determination of D_L in normal resting subjects. The increase in D_L was caused by increased pulmonary capillary blood volume during hypercarbia which was probably not dependent on systemic respiratory or circulatory changes. (*Rankin, J., McNeill, R. S., and Forster, R. E.: Influence of Increased Alvolar CO_2 Tension on Pulmonary Diffusing Capacity for CO_2 in Man, J. Appl. Physiol. 15: 543 (July) 1960.*)

CARBON DIOXIDE NARCOSIS Thirty-five emphysematous patients who showed decreased ventilation and increased carbon dioxide retention when breathing 100 per cent oxygen showed a marked increase in ventilation and decreased partial pressure of carbon dioxide when the oxygen was given by intermittent positive pressure. In all but two patients the initially elevated carbon dioxide partial pressures were reduced. Bronchodilators were not used. (*Fraimow, W. F., Cathcart, R. T., and Goodman, E.: Use of Intermittent Positive Pressure Breathing in Prevention of Carbon Dioxide Narcosis Associated with Oxygen Therapy, Amer. Rev. Resp. Dis. 81: 815 (June) 1960.*)

AEROSOL RETENTION The retention in the human lung of aerosols with a mean particle size of 0.2 to 0.5 micron was measured with various types of respiration varying in rate from 7 to 20 per minute and in tidal volume from 600 to 2,000 ml. Retention of particles was higher than 60 per cent in all subjects for all types of respiration. It was lowest with a small tidal air and increased with the tidal air to a retention between 80 and 90 per cent. Breath-holding in inspiration will often cause retention to exceed 90 per cent. There was no spectacular difference between aerosols of different particle sizes. Although it is open to question in which part of the respiratory tract the retention occurred, it is likely that these small particles were retained in the lower part of the tract. (*Herxheimer, H., and Stresemann, E.: Retention of Wet Aerosols in Human Lung, J. Physiol. 154: 9P (Nov.) 1960.*)

AEROSOL RETENTION Retention of inhaled particles in the respiratory tract is influenced by (1) inertial impaction which tends to deposit particles of larger size in the upper portions of the airway and lung, the inertial effect being directly proportional to the density and the square of the diameter, (2) sedimentation which is governed by the same influences and which causes large particles reaching the lungs to gravitate to their deeper portions, and (3) Brownian motion which keeps very small particles in motion and aids in their removal from the alveolar sacs by diffusion. The most effective size for retention in alveoli is from 0.6 to 2.4 microns. Alveolar retention is minimal from 0.4 to 0.6 micron. Particles greater than 7 microns are 90 per cent retained in the lung. Particles smaller than 0.6 micron fail to deposit in terminal bronchi while particles larger than 20 microns fail to reach the respiratory bronchioles and particles larger than 6 microns fail to reach the alveolar ducts. Respiratory rate and depth which affect residence time of par-