a positive-negative phase ventilator. The aim was to establish a respiratory alkalosis of *p*H 7.5 and P_{CO_2} of 30. This was accomplished with a respiratory rate of 18–20 per minute and a respiratory minute volume of 15–20 liters in adults, and with a respiratory rate of 20–25 per minute and a respiratory minute volume of 10–15 liters in children. Arterial *pH*, P_{CO_2} and P_{O_2} were checked at twenty minutes after the onset of hyperventilation, after opening of the thorax, ten minutes after heparinization, off bypass, before extubation, after return of consciousness, and after each occurrence that might have produced a fall in *p*H. At times twenty to thirty minutes of initial hyperventilation had produced *p*H values of 7.65. A small fall of the hydrogen ion concentration usually occurred with the opening of the chest. After removal of the clamps under hypothermia an average decrease of the *p*H to 7.35 was noted; with cardiopulmonary bypass the fall was less (*p*H 7.45). Arterial P_{CO_2} changes parallelled and preceded *pH* changes. Arterial P_{O_2} values below 120 mm. of mercury were not observed. Postoperative pulmonary edema was not seen. (*Bahuet, R., and Ploquin, F.: Notre Expérience de l'Anesthésie et de la Ventilation Artificielle en Chirurgie à Coeur Ouvert, Anesth. Analg. (Par.) 17: 9 (Jan.-Feb.) 1960.*)

CARDIAC METABOLISM Myocardial metabolism was studied during extracorporeal circulation. An increased coronary blood flow occurred. There was an increase in the utilization of oxygen, lactate and pyruvate. The metabolic changes occurred early in the perfusion, and prolongation of perfusion beyond 30 minutes had little additional effect. (*Wallace, H., Rheinlander, H., and Sugarman, H.: Cardiac Metabolism During Extracorporeal Circulation, A. M. A. Arch. Surg. 82: 138 (Jan.) 1961.*)

MYOCARDIAL ACIDOSIS The force of ventricular contraction was measured in animals. Acidosis was produced by infusing lactic acid or reducing body perfusion. During acidosis there were decrease of myocardial contractility and arterial pressure; there was decreased response to injection of vasopressors. Patients in terminal shock also have metabolic acidosis. In both animals and man, acidosis can be corrected by the use of THAM and sodium bicarbonate. Response to vasopressor drugs then improves. (*Thrower, W., Darby, T., and Aldinger, E.: Acid-Base Derangements and Myocardial Contractility, A. M. A. Arch. Surg. 82: 56 (Jan.) 1961.*)

CARDIAC ARREST Filling the arrested heart with blood from the patient's elevated limbs can restart beating. The method is effective provided cardiac arrest has been immediately recognized and no more than 15 seconds are spent in the maneuver. Three case histories are reported, in each of which the pulse became imperceptible. In one there was no bleeding when a skin incision was made. In all three the patients' legs were held vertically Within 15 seconds a pulse returned. All 3 patients recovered, in one a gastroectomy was completed, and in another an axillary dissection was performed four days later. (*Woodward, W. W.: Cardiac Arrest Treated by Elevation of Limbs for Fifteen Seconds, Lancet 2: 1120 (Nov. 19) 1960.*)

ECG BY TELEPHONE A simple telecardiographic system is designed which consists of a transmitter and a receiver. The transmitter produces a carrier wave which is modulated by the patient's heart beat. This results in a sound, the frequency of which varies with the voltage variations of the heart. A telephone placed close to the transmitter in the hospital or laboratory allows the sound to pass over the wires to a receiver in the doctor's office which converts the frequency variations back into voltage variations and there activate a receiving electrocardiograph. No direct wire connections between transmitter and telephone or telephone and receiver are necessary. (*Winsor, T., Sibley, A. E., and Fisher, E. K.: Electrocardiogram via Telephone, Western Medicine 1: 10 (Dec.) 1960.*)

HEMORRHAGE Factors which influence hemodilution following hemorrhage were studied. When animals rapidly lost 35 per cent of their blood volume, there was immediate severe hypotension, and hemodilution occurred rapidly. When blood was removed

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 respira-