

instantaneous velocities calculated were 29 cm./second at site (1) and 22 cm./second at site (2). Technically not difficult, this method provides a means to measure instantaneous velocity in any vessel with a significant rate of flow, and also a means of measuring volume flow per beat such as stroke volume in pulmonary artery. (Jameson, A. G.: *Instantaneous Linear Velocity of Flow in Pulmonary Artery Measured by Catheter Tip Method*, *Science* 128: 592 (Sept. 12) 1958.)

PULMONARY BLOOD FLOW "Effective" pulmonary collateral blood flow was measured in 12 human subjects with various types of pulmonary and cardiac abnormalities by special adaptations of the Fick principle. "Effective" collateral blood flow was demonstrated in a subject with long-standing ligation of a pulmonary artery and in other individuals with bronchiectasis, cystic disease of the lung, and idiopathic clubbing of the fingers. These blood flows, however, did not exceed 8 per cent of the total pulmonary blood flow. Subjects with atresia of the main pulmonary artery displayed large "effective" pulmonary collateral blood flows, which approximated normal values for cardiac output at rest. During exercise these flows either remained unchanged or increased. (Fishman, A. P., and others: *The "Effective" Pulmonary Collateral Blood Flow in Man*, *J. Clin. Invest.* 37: 1071 (July) 1958.)

PULMONARY HYPERTENSION Ten dogs were subjected to banding of right and left pulmonary veins. Nine dogs survived. In 5 of the 9 dogs there was a rise in pulmonary artery and pulmonary wedge pressures. In 7 dogs a pulmonary resection of 1 or 2 lobes of the right lung was done. Five to eight months after banding 4 dogs died of severe pulmonary edema. (Barnes, W. H., and others: *Experimental Production of Pulmonary Hypertension*, *Surgery* 44: 361 (Aug.) 1958.)

ENDOTRACHEAL PRESSURE The cardiac output in 16 of 19 anesthetized patients was significantly decreased when the mean endotracheal pressure was elevated. The dye dilution technique was the method em-

ployed in making serial determinations of cardiac output in anesthetized patients undergoing surgery. To minimize changes in cardiac output during operations with the thorax intact, the mean endotracheal pressure must be kept near atmospheric. This practically necessitates the use of a negative phase in the apparatus if adequate ventilation is to be accomplished. (Cathcart, R. T., and others: *Cardiac Output Under General Anesthesia, The Effect of Mean Endotracheal Pressure*, *Ann. Surg.* 148: 488 (Sept.) 1958.)

CARDIAC OUTPUT Under barbiturate anesthesia and with an open chest, cardiac output can be measured in dogs by means of an electromagnetic flowmeter. Cardiac output may be measured in the ascending aorta or in the descending aorta and aortic arch branches. In either event, coronary flow is not measured. Advantages are that the measurements can be made continuously and results are immediately available. (Schenk, W. G., and others: *The Electronic Measurement of Cardiac Output*, *Surgery* 44: 333 (Aug.) 1958.)

BLOOD PRESSURE Digital systolic and diastolic blood pressures in human subjects were estimated by means of an auscultation technique similar to the clinical auscultatory method of measuring brachial blood pressure. Narrow occluding cuffs lead to higher pressure readings than wide cuffs. Because of the effect of temperature regulation reflexes on digital blood pressure such readings should not be taken to represent central blood pressure or indication of the direction of change in central blood pressure. (Gaskell, P., and Krisman, A. M.: *An Auscultatory Technique for Measuring the Digital Blood Pressure*, *Canad. J. Biochem. & Physiol.* 36: 883 (Sept.) 1958.)

CARDIAC METABOLISM Glucose is the primary substrate for carbohydrate metabolism in the isolated, perfused beating heart of the dog anesthetized with intravenous pentobarbital. The uptake of glucose or lactic acid was not correlated with arterial concentrations. The energy production of the heart beat arrested with potassium citrate solution is approximately 1/1000-1/2000 that of the isolated

beating heart for the same interval. The energy from the arrested heart comes chiefly from residual aerobic carbohydrate metabolism that is completed within the first 10 minutes of arrest. The fall in pH in the circulatory bed of the arrested heart is gradual. (*Winterscheid, L. C., and others: Myocardial Carbohydrate Metabolism During Induced Cardiac Arrest and Post-Arrest Perfusion, Ann. Surg. 148: 481 (Sept.) 1958.*)

ARRHYTHMIAS Mephentermine (Wyamine) has an anti-arrhythmic effect upon the diseased human heart, especially on ventricular ectopic systoles. It causes a decrease in the refractory period, an increased velocity of conduction and has a positive inotropic effect. Doses up to 3 mg./kg., given intravenously, have no significant ECG effects in patients with chronic atrial fibrillation. Mephentermine is contraindicated in patients with supraventricular tachycardia with second degree A-V block. (*Wilson, M., Perez-Arzo, M., and Oppenheimer, M. J.: Mephentermine and the Arrhythmias, Am. J. Med. Sc. 236: 300 (Sept.) 1958.*)

CARDIAC ARRHYTHMIA Cyclopropane in oxygen was administered to 15 normal adults using a semiclosed system containing a soda lime canister. $p\text{CO}_2$ in the respired gas was elevated by partially bypassing the canister. Cyclopropane increased the concentration of circulating norepinephrine, but not that of epinephrine. Hypercarbia elevated both. High spinal anesthesia prevented the arrhythmias during hypercarbia and virtually abolished the increase in plasma catechol concentration. Intravenous infusions of epinephrine and norepinephrine duplicating the plasma catechol concentrations found during hypercarbia did not produce arrhythmias. Blockade of the stellate ganglia bilaterally prevented the occurrence of arrhythmias during hypercarbia, but did not prevent increases in plasma catechol concentration. Arrhythmias produced by hypercarbia during cyclopropane anesthesia in man are therefore more likely caused by an increase in the activity of the cardiac sympathetic nerves than by an increase in circulating catechols. (*Price, H. L.: Role of Catecholamines in the Initiation of Ar-*

rhythmic Cardiac Contraction by Carbon Dioxide Inhalation in Anesthetized man, J. Pharmacol. & Exper. Therap. 122: 63A (Jan.) 1958.)

HYPOCALCEMIA Digitalis is known to cause egress of potassium from the myocardial cell and this relative intracellular potassium deficit may be in part responsible for the electrocardiographic effects of digitalis. Calcium ions exert a stabilizing effect on the myocardial cell membrane to inhibit re-entry of potassium into the cell. Reduction of calcium ion concentration at the cell membrane might facilitate re-entry of potassium into the myocardial cell. Induced hypocalcemia was carried out by administering ethylenediaminetetraacetate (Na_2EDTA) to patients receiving digitalis who showed ECG evidence of increased myocardial irritability. Na_2EDTA abolished ectopic arrhythmia in 11 of 26 patients studied. This is thought to be due to binding of serum calcium by Na_2EDTA facilitating potassium re-entry into the myocardial cell through a membrane of decreased stability. Induction of transient hypocalcemia in patients receiving digitalis who show evidence of hyperirritability would be of value in evaluating the role of potassium depletion in production of ectopic rhythms; in safely abolishing ectopic arrhythmias during repair of systemic hypokalemia; and in evaluation of ECG contour changes observed in patients receiving digitalis. (*Kabakow, B., and Brothers, M.: Effects of Induced Hypocalcemia on Myocardial Irritability and Conductivity, A. M. A. Arch. Int. Med. 101: 1029 (June) 1958.*)

PERFORATION OF THE HEART During cardiac catheterization a National Institutes of Health catheter was imbedded into the wall of the right ventricle with subsequent penetration of the ventricular wall during the high pressure injection. The resulting cardiac tamponade necessitated surgical relief. When the intra-pericardial pressure was relieved, the patient's condition immediately improved and she made an uneventful recovery. (*Escher, D. J., and others: Perforation of the Heart During Cardiac Catheterization and Selective Angiocardigraphy, Circulation 8: 418 (Sept.) 1958.*)