spiratory Actions of Mephentermine in Mitral Stenosis and Its Effects on Pulmonary Function in Chronic Pulmonary Emphysema, Circulat. Res. 9: 1185 (Nov.) 1961.)

HALOTHANE The pharmacological evidence of the superiority of halothane to other agents is equivocal. Its main virtues are that it is nonirritating and nonexplosive. It does not upset metabolism as do ether or chloroform nor hepatic function as does chloroform. However, there are three seemingly undesirable actions on the circulation. First, it increases vagal activity, thus tending to cause cardiac inhibition. Secondly, it sensitizes the myocardium to epinephrine and thereby predisposes to ventricular arrhythmias. Lastly, it often lowers the blood pressure. The hypotension of halothane is associated with vasodilatation and need not, except at extremely low levels of blood pressure, cause tissue anoxia. Two safety mechanisms are built into the pharmacological action of halothane on the cardiovascular system. First, this agent does not increase the release of catechol amines from the suprarenal gland as do ether, chloroform, and cyclopropane. Secondly, as cardiac irregularities are less likely when the blood pressure is low, the hypotensive action of halothane protects the patient somewhat against dangerous ventricular arrhythmias. Halothane does not produce abdominal relaxation comparable to that obtainable with ether or chloroform. It is useful rather for operations on the head, neck, extremities, and body surface, particularly when the diathermy apparatus is being used to arrest bleeding. It relaxes the parturient uterus; and therefore its use in operative obstetrics, where there is a risk of postpartum hemorrhage, is dangerous. Halothane passes across the placental barrier to the fetus and depresses its respiratory center signifcantly; and for this reason its administration immediately before delivery may also be undesirable. By contrast it is especially useful in children, who tolerate well depression of sympathetic activity. Halothane can therefore be safely administered to children in relatively large doses, and indeed this drug may be the agent of choice for short pediatric surgical procedures. *(Leading Article–Halothane, Lancet 2: 1129 (Nov. 18) 1961.)*

HALOTHANE AND MUSCULAR RELAXANTS In patients anesthetized with thiopental and nitrous oxide the effect of halothane on muscular relaxants was studied by direct electrical stimulation (twenty times per minute) of the median nerve and registration of the contractions of the middle finger. *d*-Tubocurare, in a single dose of 3 mg., affected muscular contractions very little. After introduction of halothane 1.5 per cent, the height of the contractions remained unchanged. A reinjection of *d*-tubocurare (3 mg.), 25 minutes after the primary injection and 15 minutes after the addition of halothane, caused a pronounced diminution of muscular contractions for 15 minutes. Gallamine iodide (30 mg.), also, caused only a minimal reduction of muscular contractions. During the addition of halothane no change occurred. A second injection of 30 mg. of gallamine, 45 minutes after the initial injection and after 40 minutes of inhalation of halothane, produced an almost complete inhibition for 15 minutes. The injection of 2.5 mg. of decamethonium caused complete inhibition of muscular contractions for 16 minutes. Halothane (1.5 per cent) was administered for 25 minutes and 2.5 mg. of decamethonium were injected 40 minutes after the initial injection. There was no perceptible effect on muscular contraction. Twenty milligrams of succinylcholine inhibited muscular contractions for 3 minutes with complete restoration to the initial height in 6 minutes. After 45 minutes of halothane and 55 minutes after the initial dose, the injection of 20 mg. of succinylcholine showed an identical picture. *(Hanquet, M.: Action de l'halothane sur les inhibiteurs de la transmission neuro-musculaire, Anésth. et Analg. 18: 461 (July–Sept.) 1961.)*

DRUG ABSORPTION The peripheral circulation, the absorbing membrane (capillary wall), connective tissue ground substance, and self-depression of subcutaneous absorption of drugs by endogenously liberated compounds such as histamine and 5-hydroxytryptamine all play a role in the absorption of drugs. Epinephrine delays absorption by constricting the terminal vascular bed in the zone of absorption. The capillary flow is thus markedly

depressed. The prolonged effect of slowing absorption by epinephrine is attributed to its minimal destruction locally. Hyaluronidase promotes absorption by depolymerizing the hyaluronic acid or the connective tissue ground substance which is followed by a reduced hydrophilic capacity, giving a more fluid ground substance and an increased permeability. Fluids injected with hyaluronidase are thus exposed to a greater number of capillaries. Systemic treatment with adrenal glucocorticoids is followed by an increase in the rate of subcutaneous absorption. The explanation of this enhancing effect may be related to the anti-inflammatory and anti-edematous effect of adrenal glucocorticoids. Systemic antihistamines speed up absorption by blocking the vascular response to liberated histamine and 5-hydroxytryptamine. Systemic diuretic therapy will speed up absorption when edema fluid is present at the subcutaneous site of drug injection. (*Schou, J.: Absorption of Drugs From Subcutaneous Connective Tissue, Pharmacol. Rev. 13: 441 (Sept.) 1961.*)

POTASSIUM Fluothane anesthesia caused a rise in the serum potassium level due to the mobilization of intracellular potassium. Oral or intravenous administration of potassium should be considered following prolonged administration of Fluothane. The other ions studied (sodium, calcium, chloride and magnesium) and bicarbonate showed only insignificant changes. Particularly in patients with impaired kidney function, it seems desirable to watch potassium levels following prolonged Fluothane anesthesia. (*Staib, M., and others: Electrolyte Studies during Fluothane Anesthesia, Der Anesthesist 10: 330 (Nov.) 1961.*)

TRICHLOROETHYLENE After inhalation of trichloroethylene, trichloracetic acid appears first in blood and then in urine within three to four hours. Elimination reaches a maximum on the second or third day and then decreases exponentially for 10 to 15 days. Evidence points toward the lungs and possibly the spleen as centers of transformation. Use of trichloroethylene for anesthesia is generally frowned upon for intrathoracic, pediatric and abdominal surgery. It is most often recommended for minor procedures for which little relaxation is required. (*DeFalque, R. J.: Pharmacology and Toxicity of Trichloroethylene, Clin. Pharmacol. Ther. 2: 665 (Sept.–Oct.) 1961.*) (*Abstractor's Note—There are 442 references in this review.*)

HYDROXYDIONE The rapid intravenous injection of a 5 or 10 per cent solution of hydroxydione caused loss of consciousness after four minutes in 75 of 100 cases studied. Cramp-like pain along the vein was observed in four instances. Extravasation occurred in three patients, resulting in violent postoperative pain in the antecubital region, erythema, and cyanotic swelling of the forearm and hand. The third case, a child of five years, in addition showed arterial spasm and thrombosis necessitating disarticulation of the arm at the shoulder joint. (*Laniez, C., and Louvet, M.: L'Hydroxydione (Viadril) en Injection Rapide Concentrée, Agressologie 2: 395, 1961.*)

ANTIMETICS The routine prophylactic use of the many available antiemetics is not justified. Of 2,230 patients studied postoperaitvely, 23 per cent vomited and in only 3.5 per cent was the vomiting persistent. Even in the group receiving general anesthesia only 15 per cent had persistent vomiting. Therefore, routine prophylactic use of antiemetics is unjustified because of this relatively low incidence of protracted vomiting; because of the relative ineffectiveness of compounds in the barbiturate and antihistamine groups; and because of the important side effects, particularly hypotension and prolonged somnolence, often associated with the phenothiazine derivatives. (*Adriani, J., Arens, J., and Antony, S. O.: Post-anesthetic Vomiting, Amer. J. Surg. 103: 2 (Jan.) 1962.*)

LOCAL ANESTHETICS Tetracaine inhibits growth of staphylococcus aureus and monilia in bronchial washings in more than half of cases while lidocaine does not appear to do so. A survey of past records seems to indicate that tetracaine also inhibits growth of mycolacterium tuberculosis in a similar fashion. (*Erlich, H.: Bacteriologic Studies and Effects of Anesthetic Solutions on Bronchial Secretions During Bronchoscopy, Amer. Rev. Resp. Dis. 83: 414 (Sept.) 1961.*)