11. Mori K, Mitani H, Fujita M: Epileptogenic properties of diethyl ether on the cat central nervous system. Electroenceph Clin Neurophysiol 30:345–349, 1971
12. Mori K, Kubo M, Mitani H, *et al.*: Neurophysiological basis of ketamine anesthesia. Hiroshima J Anesth 5:21–27, 1969
13. Jouvet M: Paradoxical sleep—a study of its nature and mechanisms. Prog Brain Res 18:20–62, 1965
14. Brooks DC, Bizzi E: Brain stem electrical activity during deep sleep. Arch Ital Biol 101:648–665, 1963
15. Moruzzi G, Magoun HW: Brain stem reticular formation and activation of the EEG. Electroenceph Clin Neurophysiol 1:455–473, 1949
16. Faulconer A Jr, Bickford RG: Electroencephalography in Anesthesiology. Springfield, Ill., Charles C Thomas, 1960, pp 8–11
17. Schlag J, Balvin R: Background activity in the cerebral cortex and reticular formation in relation with the electroencephalogram. Exp Neurol 8:203–219, 1963
18. Halas ES, Beardsley JV: Specificity of multiple unit activity in the sensory nuclei of cats. Physiol Behav 3:275–279, 1968
19. Adey WR, Bell FR, Dennis BJ: Effects of LSD-25, psilocybin, and psilocin on temporal lobe EEG patterns and learned behavior in the cat. Neurology (Minneap) 12:591–602, 1962
20. Inamoto A, Fujita M, Oikawa T, *et al.*: Relationship of arterial hypertension and EEG pattern of hippocampus during cyclopropane anesthesia. Jap J Anesth 13:855–856, 1964
21. Mori K, Iwabuchi K, Ohta K, *et al.*: Neural mechanism of cyclopropane anesthesia in the rabbit. To be published.

Drugs and Their Actions

DIGITALIS AND PULMONARY VASCULATURE The effects of acute digitalization on pulmonary blood volume (PBV) and pulmonary vascular distending pressure (P_d) were studied in 23 adults during simultaneous right and left heart catheterization. Digitalization with acetylstrophanthidin (1.1–1.3 mg intravenously) was achieved over a 9–13-minute period. The subjects were divided into two groups according to the responses of left ventricular end-diastolic pressure (LVEDP) to digitalization. Group I (11 patients in whom digitalization reduced LVEDP 5 mm Hg or more) included five patients with ischemic heart disease, five with aortic valve disease (including two with aortic insufficiency), and one with mitral stenosis. Group II (12 patients in wohm digitalis did not reduce LVEDP by more than 1 mm Hg) consisted of three patients with ischemic heart disease, six with aortic valve disease (including four with aortic insufficiency), two with mitral stenosis, and one normal patient.

In Group I, digitalis decreased the heart rate by 11 beats/min, increased the cardiac index from 2.39 ± 0.19 to 2.60 ± 0.19 l/min/m^2, and decreased LVEDP from 23.6 ± 3.2 mm Hg to 12.1 ± 2.7 mm Hg. Left atrial mean pressure dropped from 24.6 ± 1.7 to 13.1 ± 2.1 mm Hg, while mean pulmonary arterial pressure dropped from 28.1 ± 2.3 to 18.5 ± 2.3 mm Hg. The calculated pulmonary vascular ressitance did not change (control, 123 dyne-sec cm^{-5}; after digitalization, 120 dyne-sec cm^{-5}). A decrease in the pulmonary distending pressure P_d from 27.8 ± 2.2 to 16.8 ± 2.3 mm Hg was observed, and was the result of the decline in both LA and PA mean pressures, since P_d is calculated by averaging mean LA and PA pressures.

Pulmonary blood volume, calculated by multiplying mean transit time from PA to LA by the cardiac index, decreased from 317 ± 27.6 to 262 ± 23.0 ml/m^2 after digitalization. A graph of pulmonary blood volume vs. pulmonary distending pres-

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12. Creutzfeldt O, Sakmann B: Neurophysiology of vision. Ann Rev Physiol 31:499–544, 1969
13. Chang HT: Cortical response to stimulation of lateral geniculate body and the potentiation thereof by continuous illumination of retina. J Neurophysiol 15:5–26, 1952
14. Arduini A, Hirao T: Enhancement of evoked responses in the visual system during reversible retinal inactivation. Arch Ital Biol 98:182–205, 1960
15. Bishop PO, Levick WR, Williams WO: Statistical analysis of the dark discharge of lateral geniculate neurons. J Physiol (London) 170:598–612, 1964
16. Rodieck RW, Smith PS: Slow dark discharge rhythms of cat retinal ganglion cells. J Neurophysiol 29:442–453, 1966
17. Suzuki H, Ichijo M: Tonic inhibition in cat lateral geniculate nucleus maintained by retinal spontaneous discharge. Jap J Physiol 17:599–612, 1967
18. Corazza R, Endo M, Tradardi V, *et al.*: Tonic neuronal activity of the central visual pathways during dark adaptation. Arch Ital Biol 106:270–282, 1968
19. Hazra J: Effects of intravenous or intraventricular injections of lidocaine on optic evoked potentials in Dial anesthetized cat. Fed Proc 28:476, 1969
20. Hazra J: Disinhibition of the inhibitory effect of darkness on optic evoked potentials by lidocaine. Fed Proc 29:252, 1970
21. Shanes AM: Drugs and nerve conduction. Ann Rev Pharmacol 3:185–204, 1963
22. Bernhard CG, Bohm E: Local anaesthetics as anticonvulsants: A study on experimental and clinical epilepsy. Stockholm, Almqvist and Wiksell, 1965
23. de Jong RH, Robles R, Corbin RW: Central actions of lidocaine—synaptic transmission. ANESTHESIOLOGY 30:19–23, 1969
24. Ritchie JM, Cohen PJ, Dripps RD: Cocaine; procaine and other synthetic local anesthetics, The Pharmacological Basis of Therapeutics. Third edition. Edited by LS Goodman and A Gilman. New York, Macmillan, 1965, pp 367–398

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sure indicated that the directions of decrease in PBV and in P_d coincided in all 11 cases, although there was considerable variation in the magnitude of these changes.

In Group II, although there was a significant decrease in heart rate and a significant increase in cardiac index, LVEDP did not change significantly. No significant changes were found in LA or PA mean pressures, in P_d, or in pulmonary blood volume. Hence, if digitalization has no effect on left ventricular dynamics, it apparently has no significant effect on the pulmonary vessels. In Group II—as in Group I—calculated pulmonary vascular resistance was unchanged.

Controls: In eight additional patients the injection of saline solution instead of acetylstrophanthidin resulted in no appreciable hemodynamic changes. (*Murphy, G. W., and others: Effects of Acute Digitalization on the Pulmonary Blood Volume in Patients with Heart Disease, Circulation 43: 145 (Jan.) 1971.*) EDITOR'S COMMENT: The authors note that pulmonary vascular resistance may not accurately reflect the vasoactive effects of drugs, since resistance measurements are affected by pulmonary arterial, left atrial, and airway pressures, and also by changes in cardiac index. In their Group II patients who showed no significant changes in cardiac output and LA and PA pressures after digitalization, there was no change in calculated pulmonary arterial resistance. In the Group I patients in whom changes in the hemodynamics of the left heart and pulmonary vessels did occur following digitalization, the pulmonary distending pressure (P_d) was decreased consistently (9/9), whereas the changes in pulmonary vascular resistance were inconsistent (four increased, seven decreased) and varied from as little as 16 to as much as 162 dyne-sec cm^{-5}. One wishes that the authors had discussed their pulmonary vascular resistance data in more detail, since a drop in P_d would result from any decrease in left atrial pressure.