an attempt to correlate these findings with those in human muscle. Results: Decamethonium always produces depolarization, even when the dose is so small that the resulting paralysis is negligible. With adequate doses, depolarization and the resulting first phase of paralysis are much more prolonged in isolated human intercostal muscle than the 10 to 15 minutes described by Thesleff for isolated frog sartorius and gastrocnemius muscles. waning of the first phase is signaled by a recovery of the indirect response and a reduction of the depolarization. The gradual development of the second phase is shown only by the mechanical events, since membrane potential now returns to and remains at resting levels. (Supported by USPHS grant GM 14874.)

Postoperative Hypoventilation and Hypoxia in Man Following Hyperventilation. A. J. SALVATORE, M.D., S. F. SULLIVAN, M.D., and E. M. PAPPER, M.D., Department of Anesthesiology, Columbia University, College of Physicians and Surgeons, and the Presbyterian Hospital, New York, N. Y. Hyperventilation lowers PACO2 and, with time, the CO2 stores of the body. It has been shown in dogs (J. Appl. Physiol. 21: 247, 1966) that spontaneous recovery of the depleted CO2 content of the body requires a period of relative hypoventilation. Breathing air during this recovery period results in hypoxia. This potential cause of hypoxia in man following anesthesia with controlled hyperventilation was the subject of Methods: Thirteen pathe present study. tients, free of cardiopulmonary disease, who had been hyperventilated an average of 234 hours during anesthesia and operation, were studied. At the end of anesthesia the inspired mixture was changed to 100 per cent oxygen for 15 minutes, PaO2, PaCO2 and pHa were measured, and hyperventilation subsequently was discontinued. Results: Apnea lasted 614 minutes, on the average, upon cessation of hyperventilation. During this time the Paco. rose from 18 to 38 mm Hg. When spontaneous ventilation began the patients were allowed to breathe air. Tidal volume and minute volume increased progressively throughout the remainder of the hour, VE/kg at 15 min was 63.6 ± 2.2 ml (mean \pm SE) and at 60 min,

102.3 ± 12.7 ml, while Pa_{CO2} during this time_□ varied less than 2 mm Hg from the value ob-\ tained at the end of apnea. Twenty minutes after the onset of spontaneous respiration, Pao. reached an average low value of $72 \pm 7.3 \text{ mm}^{\frac{1000}{12}}$ Hg and then progressively increased toward normal, averaging 83 ± 4.1 mm Hg at 30^{-3} minutes and 88 ± 3.5 mm Hg at 60 minutes. At the end of the hour the patients were allowed to breathe 100 per cent oxygen for teng minutes. Pao: averaged 587 mm Hg and wasio essentially unchanged from the values measured at the end of hyperventilation. Sum-□ maru: The hypoventilation which follows a period of hyperventilation can result in a sig-8 nificant lowering of Pao2 in man if the inspired gas is room air. Yet, this hypoventilation, due to its occurrence in an unsteady state, is asso $\frac{\omega}{2}$ ciated with normal Paco:

Effect of Ethrane on the Performance of the Left Ventricle. S. Shimosato, M.D. P.-Y. CHEN, M.D., J. B. GILBERT, M.D., and B. E. Etsten, Department of Anesthesiology Tufts University School of Medicine, and New England Medical Center Hospitals, Boston € Recent studies showed that Ethrane (2-chloro-1,1,2-trifluorethyl difluoromethy ether), a nonexplosive volatile agent, is a potent anesthetic in both animals and man However, there is no information related to the effect of Ethrane on myocardial performance Methods: The present study was designed to determine the action of Ethrane on the con tractile state of the intact canine left ventricles as determined by the force-velocity relations (Anesthesiology 29: 538, 1968) and the acc tive state, which is a measure of the force generating process of the contractile protein (J. Gen. Physiol. 40: 661, 1967). Thirteen dogs were studied. Results: Ethrane induce₹ negative inotropism in all dogs. An average arterial concentration of Ethrane of 18 mg /100 ml produced a 50 per cent depression in peak force with relatively unchanged maximum velocity of shortening. Both maximum isovolumic pressure and the first derivative of left ventricular pressure (LV dP/dt) deg creased, indicating decreases in the intensity of the active state. Summary: The market decrease in maximum force as manifested by