meperidine, 0.2 mg./kg. morphine and 0.02 mg./kg. oxymorphone are about the same, meperidine causes considerably more, and morphine considerably less, respiratory depression than oxymorphone. The results of this study confirmed the previously reported (Lunn, J. N., and others: Pharmacologist 3: 66, 1961) findings on the protective and antagonistic effects of N-allyloxymorphone on narcotic-induced respiratory depression.

Halothane Uptake by Man at a Constant Alveolar Concentration. EDMOND I. EGER, II, M.D., and NERI P. GUADAGNI, M.D., *Department of Anesthesia, University of California Medical Center, San Francisco, California.* *Method:* Halothane uptake by man at a constant alveolar concentration was determined in ten healthy human beings. Uptake was obtained from the difference between inspired and expired (end-tidal) concentrations times alveolar minute volume. The technique and instruments used are essentially the same as those of Sechzer, Linde, and Dripps (ANESTHESIOLOGY 23: 161, 1962), except that in our study the inspired concentration of halothane was periodically altered to hold the end-tidal concentration constant. Figures thereby obtained were converted to milliters uptake per 70 kg. at an alveolar concentration of 0.8 per cent halothane. *Results:* Uptake during the first minute averaged 81 ml.; was 47 ml. at five minutes, 34 ml. at ten minutes, and 28 ml. at 20 minutes. Uptake decreased slowly thereafter and at 160 minutes was 12 ml./minute. Considerable variation in uptake occurred; the mean standard deviation equalled one-third of the uptake figure. *Discussion:* If alveolar anesthetic concentration equals brain concentration, a constant alveolar concentration reflects a relatively constant "depth" of anesthesia. The above figures thus provide a guide to the average amount of halothane required to maintain a stable light level. Deeper anesthesia would require somewhat greater quantities. An increase in alveolar concentration would not result in a proportional increase in uptake because of the concomitant decrease in cardiac output. [Supported in part by United States Public Health Service Grant GM-K3-17, 685, and 2G-63.]

Determination of Anesthetic Potency. ROBERT M. EPSTEIN, M.D., S. H. NGAI, M.D., DONALD C. BRODY, M.D., and DAVID M. RITTENBERG, PH.D., *Departments of Anesthesiology, Pharmacology, and Biochemistry, Columbia University, College of Physicians and Surgeons, New York, New York.* Recent proposals of a new theory of the mechanism of the anesthetic action of inert gaseous agents depend on correlation of certain physical properties of these agents with the partial pressures required to produce anesthesia These pressures, from the literature, are useful approximations based on observation of small numbers of animals, differing in species and studied by varying techniques. One way to test theories of anesthetic action would be to detect small shifts in anesthetic potency after maneuvers which may alter the affinity of these agents for lipid or watery phases in the brain. To make such testing feasible, a more precise measurement of the absolute potency of anesthetics and the range of variation encountered is necessary. *Method:* The median anesthetic dose (AD_{50}) of a number of commonly employed agents was determined in Swiss mice, using the loss of righting reflex as an end point. Approximately ten mice per dose were exposed in a plastic chamber to a high flow of anesthetic in oxygen at constant inspiratory concentrations. The period of exposure was sufficiently long to allow brain equilibration to occur. Concentrations of the anesthetics were determined by techniques appropriate to the individual agents. *Results:* The AD_{50} and 95 per cent confidence limits as gas tensions in millimeters of mercury determined by probit analysis were: chloroform 6.4 (6.0–6.8), halothane 12.9 (12.6–13.2), cyclopropane 125 (121–129), ethylene 1,033 (1,003–1,081), and nitrous oxide 1,144 (1,112–1,179). Reproducibility was tested by repetition of studies for nitrous oxide. The separately determined values were 1,135 and 1,152 mm. of mercury and were not significantly different. Nitrous oxide was, therefore, used for further studies. Pretreatment of mice with 0.9 per cent NaCl in large doses (60 ml./kg. subcutaneously 48 and again 24 hours before study) increased the N_2O AD_{50} to 1,265 (1,238–1,297, $P < .05$), with reproducibility similar to that found in the controls. Pretreatment with 0.9 per