There were major differences between the medications in their effect on blood pressure. Secobarbital produced little change, but both phenothiazines were associated with a relatively high incidence of rises and falls in blood pressure. Most of these were not of clinical significance, but there were two instances of blood pressure rise associated with severe headache and three cases of hypotension requiring and responding to vasopressors 20–25 minutes after medication. Of the phenothiazines, promethazine had a greater tendency to produce hypertension, and promazine a greater tendency to produce hypotension. In summary, all three medication combinations described were clinically satisfactory in the dosages used. Each method appeared to have certain advantages and disadvantages, none of which were sufficiently important to select or abandon any without further study. The major conclusion was that various medications for relief of pain during labor are capable of being studied with objectivity by the technique described.

The Effects of Neurotropic Drugs Upon the Electrical Activity of the Midbrain Tegmentum. BEN F. RUSY, M.D., AND LEROY W. KRUMPERMAN, M.D. *Department of Anesthesiology, Temple University Hospital, Philadelphia, Pennsylvania.* At the present time there are only a few published reports of the effects of drugs on the electrical activity of subcortical structures in human beings. To our knowledge, no investigations of the human midbrain reticular substance have been made. In recent years animal experimentation has demonstrated the importance of the brain stem reticular substance to the wakeful state, and there have been many animal studies which have shown a definite modification of the activity of the reticular substance by neurotropic drugs. Our investigations were carried out at the time of stereoencephalotomy done by Spiegel and Wycis for treatment of parkinsonism. A multilead, bipolar needle electrode is introduced by stereotaxic procedure into the desired area. In order to direct its placement, Pantopaque encephalography is done to locate the commissures, and the electrode is then introduced according to coordinates of Spiegel and Wycis determined by roentgenogram. The section of the midbrain explored was the dorsal part of the tegmentum, an area containing fibre tracts and the cellular elements of the reticular substance. This area is very small, being ventral to the periaqueductal grey, dorsal to the red nucleus, and between the roots of the third cranial nerve and the spinothalamic tract at a frontal level passing through the posterior commissure. It is believed that the electrode must be confined to this area in order to avoid damage to important neighboring structures. After the electrode has been placed, a control electrogram is made from two levels in the area being studied. A scalp electroencephalogram, an electrocardiogram and a pneumogram are also made. Blood pressure is monitored by the cuff method. The patient up to this point usually has received no preoperative or other medication. Local anesthesia is used to insert the electrode. After a satisfactory baseline recording was obtained, the drug to be tested was injected intravenously. Continuous recordings were made until clinical signs of drug effect were seen or until it is certain that sufficient time had elapsed for the drug to act. The drugs so far examined have been atropine, scopolamine, chloropromazine, and reserpine. To date there has been little effect noted upon electrical activity of the area studied; however, only a few experiments with each drug have been performed. Dosages have been rather small but in the range of clinical effectiveness. Sometimes a definite clinical change (drowsiness) has come on after injection and this has not been accompanied by any striking electrical change. However, the activity we have thus far been recording has been background or "spontaneous" activity. We have not yet examined the action of any drug in modifying a function of the reticular substance such as the arousal response. The study will be continued with some modifications.

The Circulatory Effects of Narcotics and Narcotic Antagonists in Man. EPHRAIM S. SIKER, M.D., HENRY M. BRUNN, M.D., JEFFREY S. CRAWFORD, M.B., AND FRANCIS F. FOLDES, M.D. *Department of Anesthesiology, Mercy Hospital, and the Section on Anesthesiology, Department of Surgery, University of Pittsburgh, Pittsburgh, Pennsylvania.* Little

information is available on the effects of narcotic antagonists on narcotic induced circulatory depression in man. This study was undertaken to determine whether protection against such circulatory depression was afforded by the narcotic antagonists. Control observations of pulse rate, blood pressure, respiratory rate, and electrocardiographic tracings were made in both the horizontal and 25 degree head-up position in 40 healthy adult males and females between the ages of 18 and 58. These subjects received no medication prior to their arrival in the operating room. At the start of the test period, 20 subjects each received 1.5 mg./kg. meperidine, and 20 others 0.6 mg./kg. alphaprodine intravenously. Half the subjects in each group received 0.02 mg./kg. levallorphan tartrate intravenously two minutes prior to the injection of the narcotic. The observations made during the control periods were repeated at 2, 4, 6, 9, 12, and 15 minutes. At 16 minutes, the subjects were placed in the 25-degree head-up position, and the observations were repeated at 18, 21, 24, 27 and 30 minutes. No significant changes in pulse rate and blood pressure were observed after the use of alphaprodine alone or preceded by levallorphan either in the horizontal or the head-up tilt position. Alphaprodine alone caused a significant decrease in the respiratory rate. This was prevented by the prior administration of levallorphan. No remarkable changes were seen in the electrocardiographic tracings. In contrast, the intravenous administration of meperidine caused a moderate rise in pulse rate and fall in blood pressure in the horizontal and a statistically significant fall of pressure in the head-up tilt position. The circulatory effects were only partially prevented by the antagonist. In three subjects, who received meperidine alone and in one who also received levallorphan, the experiment had to be discontinued 3 to 6 minutes after the subjects were placed in the head-up tilt position because of severe hypotension. Meperidine alone or after levallorphan caused no significant change in the respiratory rate or electrocardiographic tracings. The findings presented indicate that narcotic antagonists do not afford protection against the primarily peripheral effects of meperidine.

Incidence of Cardiac Arrhythmias During Anesthesia. WILLIAM A. SIMS, M.D., DAVID J. BONE, M.D., AND ROBERT B. DODD, M.D. *Department of Anesthesiology, Barnes Hospital, Washington University School of Medicine, St. Louis, Missouri.* The incidence of cardiac arrhythmia has been studied in 364 unselected surgical patients by means of continuous electrocardiographic monitoring utilizing wall-mounted oscilloscopes. The age range of the patients in this series was from 2 to 96 years with a mean age of 52 years and a median of 54 years. This group thus exceeded the mean age of the general surgical population by seventeen years. There was no selection as to type of anesthetic agent or technique used, but over half (192) of the patients received ether as the primary anesthetic agent. The bulk of the anesthesias were administered by anesthesiology residents and nurse anesthesia students. Arrhythmias reported by the nurses were confirmed by a staff anesthesiologist. Since monitoring was done by visualization of oscillographic tracings and permanent records were rarely made, reporting of transient tachycardias and bradycardias was unsatisfactory. Two cardiac arrests occurred during the series. Both were standstills and were successfully resuscitated; one by thoracotomy and artificial circulation, the other by vigorous washing out of the anesthetic mixture with 100 per cent oxygen. The results of the study to this time show: (1) Cardiac arrhythmia of some type occurred in 32.9 per cent of the patients subjected to anesthesia and surgery. The actual incidence may be somewhat higher since one-third of the cases were anesthetized by nurse students who recognized arrhythmias half as frequently as the anesthesia residents. (2) Arrhythmias occur with increasing frequency with increasing age. The average age of patients exhibiting arrhythmia was 55.8 years. For patients not showing arrhythmia it was 47 years. The incidence of arrhythmias in patients over the age of 50 years was significantly greater than in those under 50 years ($p < .005$). (3) There is a much higher incidence of arrhythmias, 59.5 per cent, in patients having evidence of pre-existing cardiac disease than in patients having negative cardiac history and findings, 25 per cent. (4) The most frequent arrhythmia noted was A-V dis-