

solubilities may be preferable when general anesthesia for chronic alcoholics is required.

A New Approach to the Evaluation of Analgesics. J. C. HOFFMAN, M.D., and C. DI-FAZIO, M.D., PH.D., *Department of Anesthesia, University of Virginia Medical Center, Charlottesville, Va.* Beecher and Lasagna have both emphasized that no ideal method for the evaluation of analgesic activity exists. There is a need for a method in which both the stimulus and the response are exactly measurable, which is capable of supplying dose-response data even for a weak analgesic. *Methods:* Morphine, meperidine, and pentazocine were examined, using as the measure of potency the ability of each to lower the

ED50 for cyclopropane in rats subjected to a tail clamp. *Results:* Morphine (1 to 8 mg/kg body weight) and meperidine (20 to 60 mg/kg body weight) had a linearly-increasing effect. Pentazocine, on the other hand, (6 to 80 mg/kg body weight) had a ceiling effect at about 20 mg/kg body weight. Since the slopes of the dose-effect curves of pentazocine and morphine are different, no overall value for relative potency can ever be given. *Summary:* At clinically equivalent end-points, the relative potencies of the three drugs were in the ratio of morphine 1 mg, pentazocine 8 mg, and meperidine 10 mg. The dose-effect graphs for analgesia paralleled those for respiratory depressant activity in the human being (T. C. Smith, personal communication).

The Effect of Ventilation on Cerebral Oxygenation during Hypothermia. T. F. HORNBEIN, M.D., R. W. F. FORTNER, M.D., and D. C. CASSELLE, *Department of Anesthesiology, University of Washington School of Medicine, Seattle, Wash.* Although hypothermia decreases cerebral oxygen consumption, cerebral hypoxia might result from the leftward shift of the oxyhemoglobin dissociation curve, coupled with a disproportionate decrease in cerebral blood flow. Hyperventilation would enhance a hypoxic tendency because of the effect of hypocapnic alkalosis on

both cerebral blood flow and oxyhemoglobin dissociation. *Methods:* Cerebral blood flow (N_2O method), cerebral venous P_{O_2} , and cerebral metabolic rates for oxygen, glucose, and lactate were determined from arterial and cerebral venous samples from 13 rhesus monkeys during halothane-curare or pentobarbital-curare anesthesia. At 37 C and 27 C, measurements were made at arterial pH values of 7.55, 7.40 and 7.25, produced by altering the rate of mechanical ventilation. *Results:* Cerebral oxygen consumption was 2.9 ml/100 gm/min at 37 C and 1.4 ml/100 gm/min at 27 C.

At arterial pH:	7.25	7.40	7.55
CBF (ml/100 gm/min) at 27 C:	72 ± 9.1	40 ± 9.7	25 ± 4.7
(± S.E.) at 37 C:	154 ± 20.7	90 ± 10.5	45 ± 5.0
Cerebral PV_{O_2} at 27 C:	85 ± 9.7	43 ± 3.7	27 ± 1.6
(± S.E.) at 37 C:	100 ± 4.9	72 ± 3.1	40 ± 1.2

At a given pH_a , the arteriovenous differences for oxygen were similar at both temperatures. The lower cerebral PV_{O_2} at 27 C resulted solely from the effect of temperature on oxyhemoglobin dissociation. With the limited degree of cerebral venous hypoxemia attained in

this study, no indication of anaerobic metabolism was observed from the arteriovenous differences for oxygen, glucose, or lactate. (Supported by USPHS Grant He-08866 and U.W. 171 Grant 11-0560, and Career Development Award 5-K3-HE-9617-03.)