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 Anesthe-
sia, 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 mea-
surable, which is capable of supplying dose-
response data even for a weak analgesic.
Methods: Morphine, meperidine, and penta-
zocine 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 ef-
fect. 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. Sum-
mary: 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 respi-
atory 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 Anesthesi-
ology, University of Washington School of
Medicine, Seattle, Wash. Although hypo-
thermia decreases cerebral oxygen consump-
tion, cerebral hypoxia might result from the
leftward shift of the oxyhemoglobin dissocia-
tion curve, coupled with a disproportionate
decrease in cerebral blood flow. Hyperventila-
tion would enhance a hypoxic tendency be-
cause of the effect of hypocapnic alkalosis on
both cerebral blood flow and oxyhemoglobin
dissociation. Methods: Cerebral blood flow
(N2O method), cerebral venous P02, and
cerebral metabolic rates for oxygen, glucose,
and lactate were determined from arterial and
cerebral venous samples from 13 rhesus mon-
keys during halothane–curare or pentobarbi-
curare anesthesia. At 37 C and 27 C, mea-
surements were made at arterial pH values of
7.55, 7.40 and 7.25, produced by altering the
rate of mechanical ventilation. Results: Cere-
bral 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:  

<table>
<thead>
<tr>
<th></th>
<th>7.25</th>
<th>7.40</th>
<th>7.55</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHF (ml/100 gm/min) at 27 C:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(± S.E.) at 37 C:</td>
<td>72 ± 9.1</td>
<td>40 ± 9.7</td>
<td>25 ± 4.7</td>
</tr>
<tr>
<td>Cerebral PV02 at 27 C:</td>
<td>151 ± 20.7</td>
<td>90 ± 10.5</td>
<td>45 ± 5.0</td>
</tr>
<tr>
<td>(± S.E.) at 37 C:</td>
<td>85 ± 9.7</td>
<td>43 ± 3.7</td>
<td>27 ± 1.6</td>
</tr>
<tr>
<td>100 ± 4.9</td>
<td>72 ± 3.1</td>
<td>40 ± 1.2</td>
<td></td>
</tr>
</tbody>
</table>

At a given pH, the arteriovenous differences
for oxygen were similar at both temperatures.
The lower cerebral PV02 at 27 C resulted
solely from the effect of temperature on oxy-
hemoglobin dissociation. With the limited
degree of cerebral venous hypoxemia attained in

this study, no indication of anaerobic metabo-
loid was observed from the arteriovenous dif-
fferences for oxygen, glucose, or lactate. (Sup-
ported by USPHS Grant He-08566 and U.W.
171 Grant 11-0580, and Career Development
Award 5-K3-HE-9617-03.)