ture of certain barbituric acid derivatives. . . . The present investigation is a study of a series of 5,5-substituted barbituric and thiobarbituric acids. . . . These barbituric acid derivatives were tested on the isolated rabbit's intestine, isolated guinea pig's uterus and perfused frog's heart. . . . As the number of C atoms increased in the substituted alkyl chain, the inhibition or sedative action increased on the isolated intestine of rabbits and frogs and the isolated uterus of guinea pigs. The same degree of depression was observed in the perfused frog's heart. Sodium 1,3-dimethyl-butyl-ethyl barbiturate, a convulsant when injected in warm-blooded animals and a depressant to cold-blooded animals, produced stimulation or contraction on the isolated intestinal strips of rabbits, but depressed the isolated frog's intestine and perfused frog's heart." 13 references.

J. C. M. C.

SEEBERG, V. P., AND DILLE, J. M.: *The Comparative Rate of Gastrointestinal Absorption of Barbital, Sodium Barbital and Elixir of Barbital N.F. VII.* J. Am. Pharm. A., Scient. Ed. **32**: 133–137 (May) 1943.

"Barbiturates are generally administered orally in the form of tablets, capsules or elixirs using either the acid form of the barbiturate or the sodium salt. Absorption from the gastrointestinal tract is generally considered to be satisfactory, but differences in the rate of absorption are to be expected between different pharmaceutical preparations. . . . The preparation being studied was administered orally to a 24-hour starved cat. A period of one-half hour was allowed to elapse after administration during which the onset and degree of depression were noted. At the end of this period the cat was killed by exsanguination. The blood and the contents of the stomach, intestine and colon were assayed separately for barbital. Comparison of these values indicates the rate of absorption. . . .

"Tablets of sodium barbital administered after crushing are absorbed more rapidly from the gastrointestinal tract of 24-hour starved cats than crushed tablets of barbital or barbital administered in the form of the Elixir of Barbital N.F. VII. Crushed tablets of barbital are absorbed at about the same rate as the elixir. After oral administration only small amounts of the drug reach the colon indicating that absorption takes place mainly in the small intestine. Absorption of isotonic solutions from the ligated intestine is about the same for barbital and sodium barbital provided that both are in solution. Absorption of barbital after administration of the Elixir of Barbital N.F. VII is much slower than was expected. While depression was greater than the blood level of barbital would indicate, this can be explained by the presence of alcohol in the elixir. The delayed absorption of the barbital in the elixir probably occurs because the glycerin present delays the passage of the elixir into the intestine from the stomach." 6 references.

J. C. M. C.

SEEBERG, V. P.: *A Rapidly Absorbed Elixir of Sodium Barbital.* J. Am. Pharm. A., Scient. Ed. **32**: 137–138 (May) 1943.

"A new elixir of sodium barbital containing no glycerin was found to be absorbed rapidly from the gastrointestinal tract of cats and therefore possesses advantages over the glycerin-containing elixir of barbital." 3 references.

J. C. M. C.

SAKLAD, MEYER; SAKLAD, ELIHU, AND SELLMAN, PRISCILLA: *Inhalation Therapy.* Rhode Island M. J. **26**: 65–68 (May) 1943.

"The first and most important indication for inhalation therapy is in con-

ditions of oxygen lack in tissues. This state of decreased oxygen tension in tissue is properly termed Hypoxia. . . . By atmospheric hypoxia we mean oxygen lack in tissues due to a decrease in the partial pressure of oxygen in the inspired atmosphere. This state of oxygen hunger concerns the aviator and the anesthetist. . . . Oxygen lack in tissue as a result of a decreased minute volume exchange results in a condition which we have chosen to term Tidal Hypoxia. The decrease in tidal exchange may be caused by a depressed respiratory center, disturbed respiratory efficiency due to mechanical factors or respiratory obstruction. Drugs, as morphine, the barbiturates and anesthetic agents may depress the respiratory center and bring about an altered oxygen delivery to tissue and consequently a hypoxia. Oxygen want in tissue as a result of an inefficient respiratory exchange may be due to brain pathology. Respiratory mechanics may be so changed that tidal efficiency is impaired as in intercostal paralysis due to poliomyelitis, spinal anesthesia, or convulsions. Postural changes may interfere with the patient's ability to increase the size of his thoracic cage so that he does not have a satisfactory respiratory volume. . . . Any condition which interferes with the ability of the alveolus to transmit satisfactorily its quota of oxygen from a normal atmosphere to the circulating blood constitutes alveolar hypoxia. . . . Thus alveolar hypoxia would be the type of oxygen lack suffered by a patient having pneumonia, atelectasis, pneumothorax or pleural effusion. . . .

"Such conditions as hyperthyroidism and fever so increase the patient's oxygen consumption that it is necessary for the patient to increase not only his minute volume exchange but his circulatory efficiency. This threat to the patient's satisfactory oxygen requirement often is followed by an actual oxygen deficit. Hemoglobic hypoxia exists when there is a lessened amount of oxygen available to the tissue cell due to either an insufficient amount of hemoglobin in the circulatory blood or an altered capacity of hemoglobin to carry oxygen. . . . A slowing or stagnation of the blood would of course result in a decreased efficiency in the transportation of oxygen to the tissue cell. Such decrease accompanies the low blood pressure states which occur in shock or circulatory collapse. Histotoxic . . . type of oxygen starvation is the result of the inability of tissue to utilize properly available oxygen because of damage due to drugs or disease. A classic example for this type of hypoxia is cyanide poisoning. Atmospheric, alveolar, tidal and demand hypoxia all are relieved most readily by an increase in the partial pressure of oxygen in the inhaled atmospheres. . . . It is possible to effect higher percentages with some apparatus than with others. Ordinarily, patients suffering from hypoxia would receive as adequate relief as is possible, from a 45 to 50% oxygen atmosphere. When it is desired to remove nitrogen from tissue by inhalation therapy it is important to remember that satisfactory results may be secured only when nitrogen has been eliminated as much as possible from the inhaled atmosphere. To produce such an atmosphere the patient must be exposed to as nearly a 100% atmosphere of a gas as may be obtained. This mixture of course must contain sufficient oxygen to maintain life. The atmospheres that may be used for this type of therapy may be either 95% oxygen or a helium-oxygen mixture. The latter should contain at least 20% oxygen. It is thus obvious that only an apparatus which is capable of delivering and maintaining such a nitrogen-free atmosphere should be employed in conditions where nitrogen decompression is desired. The

same type of apparatus is employed in conditions where a helium-oxygen mixture may be desired, as in the treatment of asthma. . . .

"Except for the possible effect that carbon dioxide may have upon the oxygen dissociation curve for hemoglobin, this gas has very little place in the treatment of the hypoxic states. . . . Oxygen therapy equipment, at best, may be either confining or irritating such as the pressure of a mask upon the face, or by the presence of a catheter in the oropharynx. Some patients will tolerate some of the methods better than others. . . . The greater the care the apparatus requires the more likely is it that satisfactory percentages will not be maintained and thus the therapy is apt to be unsuccessful."

J. C. M. C.

LUNDY, J. S., AND TUOHY, E. B.: *Newer Trends in Intravenous Anesthesia.* Minnesota Med. 26: 349–350 (Apr.) 1943.

"The original technique of giving large doses of the anesthetic agent and withdrawing the needle has been abandoned in favor of intermittent injections of doses that are safe but sufficient. The principle of this technique of injection is not fundamentally different from that of the administration of ether by the open drop method. With both procedures the anesthetic agent is given if, and when, and in whatever quantity it is needed. The use of a 5 or 10 per cent solution of the anesthetic agent has been abandoned and at present a 2.5 per cent solution is used so that the untoward results from extravenous injections are no longer seen. . . . Use of intravenous anesthesia as a part of balanced anesthesia has been the latest trend in the use of the method. Preliminary medication is essential to the optimal application of intravenous anesthesia. . . . Local, regional or spinal anesthesia is employed together with intravenous anesthesia with pentothal sodium at the same time that a mixture of 50 per cent nitrous oxide and 50 per cent oxygen is administered by inhalation. This form of balanced anesthesia has certain demonstrable advantages. . . . The administration of a local anesthetic agent can be carried out either before or after the induction of anesthesia by the intravenous administration of pentothal sodium. The convulsant effect of an overdose of the local anesthetic agent is largely counteracted by the preoperative administration of a barbiturate and the intravenous administration of pentothal sodium. Pain of injection of the local anesthetic agent is neutralized by the analgesic effect of morphine plus the anesthetic effect of pentothal sodium. The preoperative administration of atropine results, among other things, in drying secretions and little or no accumulation of foreign material in the oropharynx. It also tends to prevent laryngospasm which may develop readily because pentothal sodium is a thiobarbiturate and seems to increase the activity of the throat reflexes. In cases in which intravenous anesthesia is to be used for manipulation within the throat, a local surface anesthetic agent, such as cocaine, must be applied just as should be done if the manipulation, bronchoscopy for example, were to be done with the patient under local anesthesia only. Because in deep surgical anesthesia with pentothal sodium respiration is depressed markedly, at first it was found necessary to give oxygen also. Later it was found that a combination of 50 per cent nitrous oxide and 50 per cent oxygen was just as effective in supplying the patient with oxygen and definitely decreased the amount of pentothal sodium that was necessary.

"A point of special value to remember when pentothal sodium is to be ad-