10 (706)

The rôle of lipoids and particularly lecithin in narcosis.

By B. KRAMER.

[*From the Physiological Laboratory of Cornell University Medical College, New York City.*]

Following the discovery of anesthetic properties of ether by Jackson and Morton in 1846, numerous theories appeared in the literature which aimed to explain this important phenomenon. Of these the well-known Meyer-Overton theory is the only one that has survived the test of time. It reads as follows: "The narcotizing substance enters into a loose physio-chemical combination with the lipoids of the cells, perhaps with the lecithin, and in doing so changes their normal relationship to other cell constituents through which an inhibition of the entire cell chemism results." Evidently this theory casts no light upon the nature of the alterations in cell chemism that follow. It remained for Verworn, Mansfeld, Bücher and Heaton not only to demonstrate the nature of these changes in cell chemism but also to show that the anesthetic state itself is in all probability dependent upon these alterations.

Reicher, who demonstrated the constant presence of lipoidemia after narcosis, explained this as being a protective mechanism; the lipoid molecules acting as amboceptors uniting with anesthetic and thus protecting the more vitally important brain lipoids. Nerking attempted to prove this experimentally by injecting various quantities of a 1 to 20 per cent. lecithin emulsion in normal salt solution intravenously, intraperitoneally, intraspinally or subcutaneously in animals which had been narcotized or were about to be anesthetized and claimed to have shown that "The injection of lecithin has an undoubted influence upon the duration and after effects of anesthesia in that it shortens its duration, brings about a more rapid return to consciousness and eliminates unpleasant after effects."

A careful analysis of Nerking's work shows it to be scarcely worthy of serious consideration, owing to its lack of exactness in the dosage of the narcotic and the indefiniteness of the criteria used.

Nevertheless, the importance of his conclusions, if confirmed, is quite evident if this could be done with the above mentioned experimental defects eliminated.

In order to accomplish this all anesthetics were given intravenously, a 5 or 10 per cent. ether solution in normal salt solution being used, and this was injected at definite rates; the lecithin emulsion was also injected directly into the vein. The criteria used were the appearance and disappearance of the corneal reflex, or, when this did not occur, the loss of cutaneous pain sensation was used. Other criteria were the time when the animal first raised its head, when it first assumed the erect posture, and when all ataxia disappeared. The results obtained seem to point overwhelmingly to the following conclusions:

1. That the intravenous injection of 5 to 30 c.c. of a 5 or 10 per cent. emulsion of lecithin, depending upon the size of the animal used, does not interfere with the induction of anesthesia and that this can be accomplished as readily in animals thus injected as in controls.

2. That in the majority of experiments, lecithin has no effect upon the rapidity with which the various phenomena which indicate the animal's recovery from the effects of anesthetic appear, in fact, in most cases, it retards their appearance.

The above experiments do not seem to bear out Reicher's assumption as to the cause of the lipoidemia and the explanation of this phenomenon still remains an open question.[1]

11 (707)

Habit and its relations to the nervous system in the earthworm.

By ROBERT M. YERKES.

[*From the Psychological Laboratories, Harvard University.*]

This is a preliminary report of an investigation now in progress, the purpose of which is (*a*) to demonstrate whatever ability the earthworm may have to acquire habits of a certain order; (*b*) to discover the characteristics of any habits which appear; (*c*) to

[1] The complete report of this work will appear in the *Journ. of Exp. Med.* for February, 1913.