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Some Further Observations on Sodium Iso-Amyl-Ethyl-Barbiturate as a Laboratory Anesthetic.

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The insoluble iso-amyl-ethyl-barbituric acid (amytal) may be dissolved by neutralization with 15% NaOH and gentle heat.[1] Subsequent clouding of the solution may be cleared by filtration, or by more NaOH. The experiments reported below show that such treatment does not decrease the anesthetic power, nor increase the toxicity, of the drug.

Anesthesia has been produced in human beings by the intravenous injection of solutions of the anhydrous sodium amytal.[2] It is stated in the report cited[2] that the solutions made by neutralization are more toxic and less effective than those made from the pure sodium amytal. This anesthetic is used in the laboratory to produce anesthesia for the study of problems involving carbohydrate metabolism. Does the increase in toxicity reported affect in any way the mobilization of glucose?

Solutions of sodium amytal made by neutralization of the acid, and from the anhydrous powder of pure sodium amytal* were injected intravenously into cats, rabbits and dogs. Previous to the injection the animals were anesthetized with ether, and the blood pressure recorded. The right vagus was stimulated just before and after each injection. The drugs were diluted so that 1 cc. of the solution contained 25 mg. The sodium amytal solution by neutralization was diluted from the stock 10% solution just before the injection; that from the pure sodium amytal was made a few minutes before use. Samples of such solutions were kept for varying periods, and compared with the 2 above as to toxicity, effectiveness, and stability. No difference could be found between any of the samples injected. No increase in toxicity was evident after the solutions had stood from 1 to 60 days. No experimental evidence could be adduced that these solutions are influenced by exposure to air.

It was found that intravenously injected sodium amytal solutions impaired the effects of vagus stimulation on the heart. This is very

[1] Mulinos, M. G., *J. Pharm. Exp. Ther.*, 1928, xxxiv, 425.

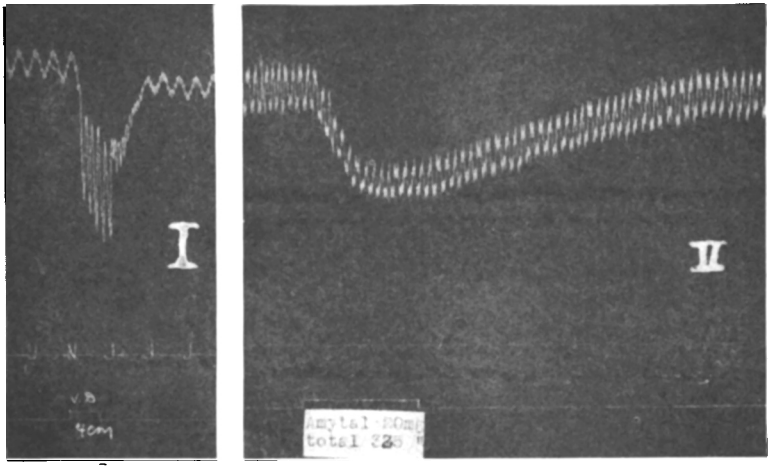
[2] Zerfas, L. G., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 399.

* Obtained through the kindness of Eli Lilly & Company.

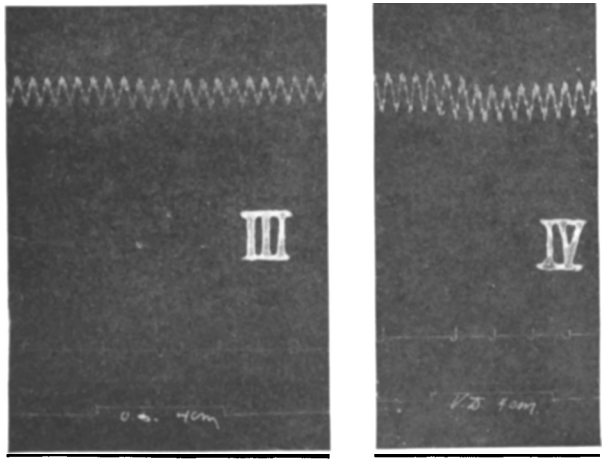
well illustrated on the accompanying chart. Here is also shown the toxic effect of a freshly prepared solution of sodium amytal from the pure anhydrous powder.

CHART.

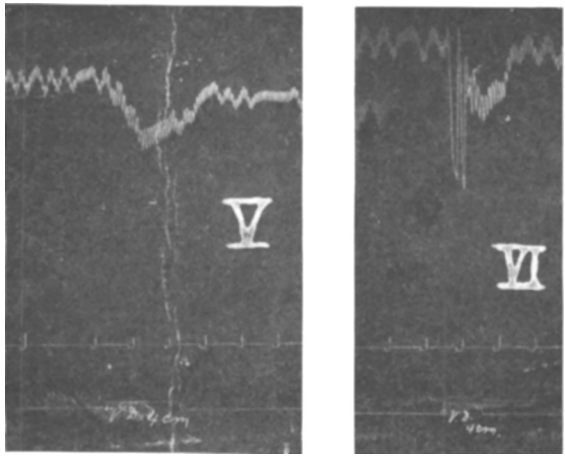
Cat, F., weight 3.4 kg. Ether anesthesia.
B.P. through left carotid artery. Injections into right jugular vein.
V.D. = Right vagus, cut; inductorium at 4 cm. Time = 5 sec.



I. Vagus stimulated before any amytal.
II. Effect of 20 mg. sodium-iso-amyl-ethyl-barbiturate (Lilly) intravenously, to total 37.5 mg. Fluid injected = 0.8 cc.



III. Vagus stimulation 5 min. after a total of 50 mg. per kg. of amytal sodium had been given.
IV. Vagus stimulation 45 min. after the drug.



V. Vagus stimulation 1.5 hrs. after the drug.
VI. Vagus stimulation 2.1 hrs. after the drug.

Summary: (1) Solutions of sodium amytal injected intravenously depress the circulation. (2) Such solutions cause prolonged but temporary paralysis of the vagus to the heart. (3) These solutions are stable, and do not show any increase in toxicity within 2 months.

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A Photographic Method of Recording Plethysmograms.

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(Introduced by Charles Sheard.)

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Measuring the change in volume of an organ is done ordinarily by placing the organ under investigation in a plethysmograph and computing the change in volume that occurs in the air space between the organ and the interior wall of the plethysmograph. The change in volume manifests itself by a change in pressure when the plethysmograph is a portion of a closed system so that if, for example, the organ expands, the volume of the system decreases and the pressure increases. Hence by noting the change in pressure it is possible to follow the corresponding change in volume of the organ.

A record of the change in pressure may be made by one of several