

TABLE II.  
Influence of Iodoacetic Acid upon Rate of Lactate Production of Fatigued Muscle.

| Experiment | Iodoacetic<br>Injected | Min. after<br>Injection | Lactic Acid<br>Found % |                                       |
|------------|------------------------|-------------------------|------------------------|---------------------------------------|
| 15         | A                      | 1/30,000                | .054                   | Frozen immediately.                   |
|            | B                      |                         | .128                   | In N <sub>2</sub> 20 min. after stim. |
| 17         | A                      | 1/6,000                 | .018                   | Frozen immediately.                   |
|            | B                      |                         | .018                   | In N <sub>2</sub> 20 min.             |
| 20         | A                      | Control                 | .242                   | Frozen immediately.                   |
|            | B                      |                         | .256                   | In N <sub>2</sub> 20 min.             |
| 21         | A                      | Control                 | .210                   | Frozen immediately.                   |
|            | B                      |                         | .215                   | In N <sub>2</sub> 20 min.             |

Muscle brei of thigh muscle taken from injected frogs uniformly showed complete inhibition of lactic acid formation after doses of 1/5,000, 1/6,000, or 1/15,000, but incomplete inhibition after doses of 1/30,000. The rate of lactic acid production in brei of muscle is slowed in proportion to the concentration of iodoacetic acid.

*Summary.* 1. There is conclusive evidence that iodoacetic acid slows the rate of lactic acid production in the anaerobic recovery period, and the slowing is in proportion to the concentration of the poison. 2. Iodoacetic acid does not accelerate removal of lactate under anaerobic conditions.

## 6107

## Sexual Reactions of Certain Anurans after Anterior Lobe Implants.

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It is well known that homoplastic implants of the anterior lobe of the pituitary induce sexual precocity in many animals. The present investigation continues the work of Wolf,<sup>1</sup> on frogs. The same technique of injection is used. Since, by giving daily implants of anterior lobe of the pituitary to mature frogs that had ovulated normally in April, it was possible to induce a second ovulation as early as October, it seemed of interest to determine how soon a sec-

<sup>1</sup> Wolf, O. M., *Proc. Soc. Exp. Biol. and Med.*, 1929, **26**, 692.

and ovulation could be secured by this method, following a previous artificially induced one. By thus beginning the experiments with an artificially induced ovulation, the season of the year is apparently negligible, and the exact time of the first ovulation is accurately recorded.

The frogs were heavily parasitized and many died of "red-leg". Fifty mature female leopard frogs (*Rana pipiens*), were given implants of 2 anterior lobes of the pituitary daily. Only 5 survived the entire experiment. After about the fifth implant, 44 were still living and had ovulated. The number of eggs discharged in every case exceeded four thousand. The second day after ovulation, an observational operation was performed in many to see if any mature ova remained undischarged. In no case were there more than 18 mature ova in the body cavity, ovaries, oviducts or uteri. (Post-mortem examinations made on those that died of red-leg after ovulation confirmed these findings.) After 2 months, only 5 frogs were still living. Daily implants of anterior lobe were again given. After the third implant, one of the frogs died of red-leg. Postmortem investigation revealed the eggs were mature and the oviducts were swollen and ready for ovulation. After the eighth implant, the remaining 4 experimental frogs had again ovulated. The number of ova discharged were in each case more than four thousand. Some of these eggs were fertilized by males stimulated with anterior lobe implants, and went entirely through metamorphosis.

Can the second artificially induced ovulation be speeded up still more by daily implants of anterior lobe of the pituitary? Out of 8 frogs only 2 survived. After the first ovulation, one of these was given one anterior lobe injection daily, and on the 26th day, the amount injected was increased to 2 anterior lobes a day. On the 29th day the second animal was also given 2 anterior lobe injections. This daily treatment was continued until the 39th day when both animals were killed. Postmortem inspection showed that the ova in the ovaries of each frog were only medium sized, with more development in the frog which had not received the implants daily after the first ovulation. Judging from this limited number of animals, there is no effect in speeding up the rate of development of the ova in the ovaries by such implants, although obviously more animals must be used in such an experiment before positive conclusions can be drawn.

Experiments were also carried on which duplicated the findings of Houssay, Giusti, and Lascano-Gonzalez,<sup>2</sup> in inducing ovulation

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<sup>2</sup> Houssay, B. A., Giusti, L., and Lascano-Gonzalez, J. M., *Rev. Soc. Argent. Biol.*, 1929, 5, 397.

in toads (*Bufo americanus*), in that only homoplastic implants of anterior lobe substance were effective. As many as 2 implants of frog anterior lobes were given daily for 15 days with no result. On the other hand, homoplastic implants readily induced ovulation.

Contrary to the findings of Wolf,<sup>1</sup> it was possible to induce male frogs to fertilize eggs at any time of the year by daily implants of anterior lobe of the pituitary. In most cases only one implant was necessary to induce trilling, croaking, clasping, and discharging of the sperm. However, 2 implants were sometimes required. It was also found that ovulation in the females was hastened by the clasping of the male.

Several other facts of interest were noted. Contrary to the findings in the case of rats by Evans and Simpson,<sup>3</sup> the speed of the reaction seemed to be uninfluenced by the sex of the animal from which the anterior lobe substance was taken. When the frog ovulates normally, practically all of the eggs are discharged successively at one laying. The few mature eggs that remain are discharged within a few days. The thousands of ova in the ovaries develop simultaneously, and when all are mature, they are discharged at the same time. Giving 2 anterior lobes at each injection proved more satisfactory both as to the time of the reaction and as to the number of anterior lobes necessary to induce the reaction.

## 6108

**Avitaminosis. X. Further Studies on the Effect of Vitamin B Deficiency on Lipid Metabolism.\***

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Sure and Smith<sup>1, 2</sup> have reported preliminary results on the influence of vitamin B deficiency on the concentration of lipids in the blood of the albino rat, indicating that lipemia is a symptom complex in this avitaminosis. Further detailed studies from this laboratory,†

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<sup>3</sup> Evans, H. M., and Simpson, M. E., *Am. J. Phys.*, 1929, **89**, 375.

\* Research paper No. 267, Journal Series, University of Arkansas.

<sup>1</sup> Sure, B., and Smith, M. E., *J. Am. Med. Assn.*, 1931, **97**, 301.

<sup>2</sup> Smith, M. E., and Sure, B., *PROC. SOC. EXP. BIOL. AND MED.*, 1931, **29**, 158.

† All of the biochemical work on blood changes in avitaminosis is being carried out in the laboratory of Agricultural Chemistry.