

instance, whereas human blood serum exhibits a content of 9 or 10 mg. per hundred cubic centimeters, the serum of infants suffering from tetany may exhibit a decrease in calcium amounting to more than 50 per cent.²

A second problem concerns the possibility of altering the calcium content of the blood. Considerable evidence might be cited to show that the feeding of diets rich or deficient, respectively, in calcium makes no appreciable difference in the amount of this element found in the blood, bones or other tissues.³ Confirmation has just been afforded by Clark,⁴ at the University of California. Feeding a calcium-rich diet to animals had no effect on the calcium content of their blood. A transitory increase could be obtained only by intravenous or subcutaneous injections of lime salts. These findings with respect to the blood, however, do not justify the assumption that in the long run variations in the intake of calcium are without moment to the body.

THE ANTIVIVISECTION INITIATIVE IN CALIFORNIA

The public and the medical profession in California are facing a serious situation. An antivivisectionist initiative is to be voted on by the people of the state at the November election. If the majority of the voters approve the measure, it will become a law without any action on the part of the legislature or of the governor.

Even a cursory examination of the proposed legislation reveals its harmful character. If adopted, all the experimental research in general biology, in agriculture, and in general and veterinary medicine would have to be discontinued. Furthermore, the proper training of students in these essential subjects would be rendered impossible. The measure would virtually abolish in California the use of modern diagnostic methods in the practice of medicine. No Wassermann reactions, no diphtheria tests for virulence, no inoculations to determine the presence of tuberculosis would be permitted. The preparation of vaccines and curative serums, and the standardization of drugs by animal tests could not be carried out. Many public health activities would be paralyzed. For example, the making of a positive diagnosis of bubonic plague, and the control and study of certain epidemics of food poisoning would be stopped because they require procedures prohibited by the proposed law.

The Board of Regents of the University of California and the Trustees of Stanford University have

united in a public protest against the antivivisectionist initiative. A part of the statement is as follows:

The advance of sanitation, modern medicine and physiology and the teaching of biology all rest on animal experimentation. The control of epidemic diseases, the management of surgical operations and of childbirth, and the certification of milk and water supplies would be impossible without the knowledge gained by such studies. In fact, the whole structure of the present day protection of the public from disease rests upon animal experimentation.

The University of California and Stanford University are vitally interested in this initiative measure since its passage would stop the research work now going on in their medical schools, hospitals and laboratories, and in the Bureau of Animal Industry. The studies on botulism in olives, which will not only save the ripe olive industry of the state, but many lives, would cease, as would likewise the manufacture of serum for the prevention of hog cholera, the preparation of vaccine for anthrax, and the various other measures that annually save millions of dollars and prevent great suffering among domestic animals. Even feeding experiments on animals would be impossible.

No worse attack on the welfare of the state and on the right of the university to seek and teach the truth could be made. Every man, woman and child, every unborn babe, every domestic animal in the state will be affected if this measure becomes a law. It is unnecessary special legislation due to prejudice and misinformation. No one will tolerate cruelty to animals. The present laws of the state are drastic and quite sufficient to control any abuse. We know that there is no cruelty to animals in the laboratories of the universities. They are in charge of men and women of the highest character, who are unselfishly working to better the lot of their fellow men. Anesthetics are always used for animals in the laboratory in exactly the same way that they are used by surgeons in the operating room. The real object of the antivivisectionist is not the prevention of cruelty to animals, but the prevention of progress in science and medicine.

With reference to the statement that the present laws of the state are sufficient to control any abuse, it is well to recall that in 1915, Hiram Johnson, then governor, vetoed a proposed antivivisection law, and in explaining his refusal to sign the bill, declared:

I may add that the laws of the state of California for the prevention of cruelty to animals and the punishment of those guilty are plenary. Full authority is given to the humane officer, under the law, to obtain search warrants, enter premises, and gather such evidence as he may suspect exists. With our drastic laws, there can be no excuse for those who insist cruelties are practiced upon animals for permitting these cruelties to continue or those practicing the cruelties to go unpunished.

In the history of the efforts of antivivisectionists to prevent the progress of medicine by methods that have proved of the utmost value in every one of the natural and biologic sciences, this is the first time that an appeal has been made directly to the voters. Eastern antivivisection journals have called repeatedly for financial and other support for the propagandists who are working in California. The activities carried on there indicate that a large amount of money has been contributed from other parts of the United States, and that the usual distribution of misleading and harrowing descriptions of laboratory procedures, a practice so severely censured by the British Royal Commission, has been employed. A test is thus to be made of the general intelligence of the voters of California. When people are properly informed of the methods of animal

2. Howland, J., and Marriott, W. McK.: *Quart. J. Med.* **11**: 296, 1917-1918.

3. Weiske, H.: *Ztschr. f. Biol.* **7**: 179, 133, 1871. Weiske, H., and Proskou, H.: *Ibid.* **8**: 239, 1872. Weiske, H.: *Ibid.* **10**: 410, 1874. Voit, E.: *Ibid.* **16**: 55, 1880. Aron, H., and Sebaue, R.: *Biochem. Ztschr.* **8**: 1, 1908. Kost, A.: *Die Kalkverteilung im Organismus nach Aufnahme von Chlorcalcium*, Inaug. Diss., Bonn, 1913. Patterson, S. W.: *Biochem. J.* **3**: 39, 1908. Denis, W., and Minot, A. S.: *J. Biol. Chem.* **41**: 357, 1920.

4. Clark, G. W.: *Effect of Hypodermic and Oral Administration of Calcium Salts on the Calcium Content of Rabbit Blood*, *J. Biol. Chem.* **43**: 89 (Aug.) 1920.

experimentation, the precautions that are taken to avoid unnecessary pain, the character of the investigators, and the beneficent results that flow from medical research, there is no question that a large majority will not only tolerate, but will promote the efforts of the laboratory workers. It is of prime importance that well-informed physicians recognize the fundamental question which is presented by this legislation, and that they spend time freely to give information as to what the measure really means. The burden of responsibility is placed on the enlightened because we live in a democracy, and are ruled democratically.

Current Comment

A NEW PHASE IN THE SERUM THERAPY OF EPIDEMIC MENINGITIS

We have no experimental evidence that meningococci secrete soluble toxin in the strict sense of the word, and it has been assumed by some that the action of meningococci is due largely to substances of the nature of endotoxins, so called. The first definite evidence that such may be the actual case has been produced by Gordon,¹ who finds that extract of dried meningococci in distilled water is fatal to mice in doses of from 0.1 to 0.2 c.c. intraperitoneally. This extract is highly heat resistant, withstanding a temperature of 100 C. or even 120 C. for half an hour without any apparent loss of toxicity which, however, is lost after heating to 120 C. for two hours. Increase in the virulence of a meningococcus strain is not necessarily associated with a demonstrable increase in the production of endotoxin, as Gordon found the virulence of a strain of Type I could be increased tenfold while its toxicity remained unchanged. Another point in favor of the existence of a meningococcus endotoxin is furnished by the following observation: At the beginning of the outbreak of epidemic meningitis in the British armies, the antimeningococcus serum used failed to reduce the gross mortality below 40 per cent. except in the London District, where the serum reduced the mortality to 18.5 per cent. With a view to finding the cause of this variation in the potency of the serum, Gordon took up a study of the specific antibodies in antimeningococcus serum, and he came to the conclusion that the efficiency of the serum used in the London District was not due to its content in agglutinin, precipitin, opsonin, bacteriolysin or complement fixing substances, but to the presence of an antiendotoxin. He found that 0.5 c.c. of the therapeutically successful serum neutralized one minimal lethal dose for the mouse of endotoxin of either Type I or II. Gordon finds that antiendotoxin serum for either Type I or Type II can be produced by injecting rabbits with the corresponding dried meningococci, Type II, though less toxic to the animal, being the better antigen. Further experiments looking to the production of a more potent antimeningococcus serum by making it more definitely antiendotoxic are desirable.

1. Gordon: Special Report 50, Medical Research Committee, 1920.

MOSQUITOES AND BATS

Since the danger of mosquitoes as a factor in the transmission of disease has come to be clearly understood, many suggestions for their eradication have received serious consideration. Some of the proposed plans have proved to be practical and have been put into operation in various parts of the world. This is particularly true of schemes for destroying the breeding places of the mosquitoes by drainage and other sanitary procedures. Where this has proved to be too costly or difficult, suitable chemical treatment, such as the spreading of oil in the objectionable localities, has been found efficacious in reducing the numbers. Among other projects has been the search for biologic agencies that will destroy the insects. Thus, there are species of fish which consume the mosquito larvae. Considerable newspaper notoriety has been attained by a suggestion widely advertised in one of the Southern states suggesting the desirability of securing an increase in the numbers of bats living in localities where mosquitoes and mosquito-borne diseases abound. The proposal is based on the admitted fact that bats devour mosquitoes among the other flying insects that they capture on the wing. Experts of the Bureau of Entomology have been investigating the assertion that bats are important mosquito-destroying animals with respect to the alleged desirability of encouraging the erection of the proposed bat-roosts. The report¹ does not warrant any undertaking of this sort. The evidence in regard to Southern bats is still conflicting, while even experimentation with Northern bats seems not to justify the expense. Bats, however, do feed on injurious insects, and very likely should be protected, a course that the state of Texas is being urged to adopt. However much sanitarians may regret the apparent untenability of the bat-roost idea and the inadvisability of attempting the institution of artificial batteries, the public at large is not likely to regret the decision to leave the bat where it naturally belongs.

IS FAT ABSORBED DIRECTLY INTO BLOOD VESSELS?

It is almost a self-evident truth that, in order to recognize and understand properly abnormalities in the metabolism of matter in the body, we must first know precisely what normally becomes of the food that we eat. The story of the transformation of the nutrients in the organism still remains to be written in its entirety. Even the first steps were scarcely recognized until recently. Today it is known fairly well how carbohydrates leave the alimentary tract and enter the portal blood stream to be mobilized by the liver. The fact that proteins are largely converted into amino-acids prior to their absorption has also been a recent contribution. They reach the tissues directly through the circulation. Fats, too, are now known to be digested, i. e., hydrolyzed, prior to absorption. A resynthesis of the fatty acids occurs after they leave the lumen of the intestine, and it has long been taught that, in contrast with the products

1. Howard, L. O.: Mosquitoes and Bats, Pub. Health Rep. 35: 1789 (July 30) 1920.