same time; sometimes, also, the infection produced remains unseen by microscopical examination and is only detected by killing the inoculated animal and by sub-inoculating another rat with blood from it. Inoculations are less likely to fail, or result in unobvious infection when considerable quantities of blood are inoculated.

In order to obtain considerable quantities of material for inoculation from rats in which spirochætes could not be found by blood examinations, blood was aspirated from hearts and spleens were excised. Of these two methods the aspiration of heart's blood was the more successful. Under chloroform, it is easy to aspirate from 1 to 2.5 ccm. of blood from the heart of an adult rat without injuring the animal. By so doing, spirochaetes were shown, in one instance, to be present in an apparently immune rat thirty-two days after the parasites were last seen by the daily examination of blood films. Previously, this rat had twice been infected by inoculation and had acquired an immunity shown by two unsuccessful inoculations. Two subsequent, also unsuccessful, inoculations showed that the rat was still immune to the strain employed in this experiment.

It should be remarked that several similar experiments did not reveal latent infections in immune rats.

50 (1510)

The influence of water-soluble vitamine on the nutrition of dogs.

By W. G. KARR (by invitation)

[*From the Sheffield Laboratory of Physiological Chemistry, Yale University, New Haven, Ct.*]

Studies on a few species of animals have indicated that the water-soluble vitamine is of importance to nutrition during all stages of life and that prolonged absence of it from the diet will lead to a diseased condition. In the present investigation the role of water-soluble vitamines in the nutrition of the dog has been under consideration.

The animals were fed a diet devoid of water-soluble vitamine and consisting of lard, sucrose, inorganic salts, and protein in the

form of casein or wheat gluten. It furnished about 70–80 calories per kg. body weight. Such food mixtures were consumed readily by the dogs during a period from three to nine weeks; thereupon they began to refuse part or all of their food. Characteristic symptoms, similar to those described by Voegtlin and Lake[1] were developed by some of the animals. The ultimate failure to eat was always noted.

Ingestion of as little as 1 gm. of brewer's yeast, which had been previously dried, will cause a quick recovery of the desire to eat. 5 gm. of the dried yeast will bring about the disappearance of the polyneuritic symtoms in 8–12 hrs. and a quick recovery of the animal to its normal condition.

The utilization of the protein nitrogen is not effected by the lack of water-soluble vitamine.

Studies in metabolism on diets with and without vitamine are being conducted.

The fat-soluble vitamine is apparently of less importance than the water-soluble in the nutrition of the adult dog.

[1] Voegtlin and Lake, Am. J. Physiol., 1918, xlvii, 558.