ascorbic acid. However, in the presence of erythrocytes, the ascorbic acid is reversibly oxidised when precipitating the blood with trichloroacetic acid. Hence only after reduction with hydrogen sulphide (after mercuric acetate precipitation) can the quantity of ascorbic acid be determined[3].

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[1] McHenry and Graham, NATURE, 135, 871; 1935.
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Proteolytic Digestion in the Ammocœte Larva

MISS ALCOCK[1], in an early publication on digestion in the ammocœte larva, stated that extracts of the liver, alimentary canal and skin showed proteolytic activity of the peptic type. More recently, however, Berrill[2,3] has described an enzyme of the tryptic type in the 'liver' and skin (hatching enzyme) of ascidians, and in view of the phylogenetic relationship between these forms, Miss Alcock's work, which was carried out before the realisation of the importance of *p*H control, clearly demands reconsideration.

In the course of investigations, still in progress, into the problems of digestion in the Cyclostomata, I have found that proteolytic digestion in the ammocœte larva of the brook-lamprey is in fact markedly similar to that of the Ascidiacea, for in extracts of the anterior end of the so-called mid-gut (by which is meant the main wide portion of the intestine) and of the skin, it is possible to demonstrate, using as substrates casein (for formol – caustic soda titration) and gelatine, strong proteolytic activity of the tryptic type, the optimum being at about *p*H 8. The intestinal extract is stronger than that of the skin. No such effect is obtainable from extracts of the liver or of the remainder of the mid-gut, although all four extracts show a very weak proteolytic activity in an acid medium of a *p*H at least as low as 1·5; the most reasonable explanation of this latter effect would seem to be that it is due to the presence of an autolytic tissue enzyme.

With regard to the localisation of the digestive enzyme in the mid-gut, it may be noted that recent work (Boenig[4], Cotronei[5] and others) on the so-called 'pancreas' of the Cyclostomata appears to have established firmly the fact that this organ is exclusively endocrine in nature, Cotronei pointing out that the zymogen cells must therefore still be confined to the intestinal epithelium. Now Brachet[6] had previously directed attention to the presence in the epithelium at the anterior end of the mid-gut of specialised granular cells, characterised especially by the possession of very large nucleoli, and had suggested that these might represent a localisation of zymogen cells. It will be seen that my results indicate that the proteolytic enzyme of the mid-gut is produced in precisely this region.

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Guanine in the Excreta of Arachnids

SINCE the work of Gorup-Besanez and Will in 1849[1], it has been classical to regard guanine as taking the place of uric acid as the main nitrogenous end-product of arachnid metabolism. This view is accepted in all the monographs on comparative biochemistry, such as that of von Fürth[2], but it appears to rest wholly on colour tests of uncertain value and deductions from crystal form.

Accordingly, it was thought desirable to examine the Arachnida and their metabolic products with the aid of the specific deaminating enzyme guanase which occurs in mammalian (rabbit) liver and forms xanthine from guanine. A number of different species of spider were examined, and the work will be continued on tropical material in Siam. Here only the experiments on the collected excreta of the common garden spider, *Epeira diadema*, will be mentioned. By this specific method, following the details given by G. Schmidt[3], an average of 12 per cent of the weight of the excreta was found to be guanine. In view of the fact that no separation of the product of the Malpighian tubes from that of the gut was made, this figure is fairly considerable.

This is the first demonstration of the presence of guanine in arachnid excreta using a specific enzyme.

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Structure of the Proboscis in Blood-Sucking Diptera

DR. S. K. SEN[1] has expressed the view that the food-canal of blood-sucking Diptera is not formed, as is generally supposed, by the apposition of the labrum-epipharynx and the hypopharynx, but that it is actually the lumen of the hypopharynx itself, a channel which has been regarded hitherto as the continuation of the salivary duct. From the studies I have made it appears to me that this view is quite incorrect. An adequate reply to Dr. Sen would occupy too much space in this journal, but I have fully explained my views in various papers in *Parasitology* (1926, 1928, 1929 and 1932) and I must ask those who are interested in the subject to refer to them.

Dr. Sen says that the labrum-epipharynx is entirely unconnected with the buccal chamber (termed *hyoid* in my papers), but in fact in all the blood-sucking Diptera which I have studied, the epipharynx is continuous posteriorly with the dorsal part of the wall of the hyoid or, if this sclerite is absent, with the anterior membranous wall of the pharynx. The apodemes (termed *stipites* in my papers) do not separate the labrum-epipharynx either from the buccal chamber (hyoid) or from the hypopharynx, since each of them is attached to the postero-lateral part or to the posterior process of the labrum. Furthermore, as regards the statement that the salivary duct terminates at the base of the hypopharynx, this view again appears unsound, since in all blood-sucking Diptera, with the exception of those of the genus *Culicoides*, the common salivary duct penetrates the hypopharynx and opens at its tip.