

Collections made in the main stream indicated a fairly constant and dense population of young fish over a period of eight days after the first appearance of larvæ in this habitat; however, with the gradual break-up of the stream into disconnected pools, the number of larvæ decreased suddenly and has remained at a low level for some weeks. If these environmental conditions are typical for this period of the 'long' rains, then it would seem probable that larval *C. mossambicus* suffer severe mortality before reaching the lake. On the other hand, rainfall in this area during March and April had been unusually light and irregular.

It has not yet been determined at what stage in the life-history young fishes find their way into the lake.

A full description of embryonic and larval development in *C. mossambicus* will be published elsewhere.

P. H. GREENWOOD

East African Fisheries Research Organization,  
Jinja, Uganda.  
May 23.

<sup>1</sup> Graham, M., "A Report on the Fishing Survey of Lake Victoria 1927-28" (Crown Agents for the Colonies, London, 1929).

<sup>2</sup> Worthington, E. B., "A Report on the Fishing Survey of Lakes Albert and Kioga" (Crown Agents for the Colonies, London, 1929). "A Report on the Fisheries of Uganda" (Crown Agents for the Colonies, London, 1932). Ricardo Bertram, C. K., Borley, H. J. H., and Trewavas, E., "Report on the Fish and Fisheries of Lake Nyasa" (Crown Agents for the Colonies, London, 1942). Lowe, R. H., "Report on the Tilapia and other Fish and Fisheries of Lake Nyasa, 1945-47" (H.M.S.O., London, 1952).

### Elementary Bodies in Bovine Malignant Catarrh

MALIGNANT catarrh in cattle is widespread, occurring in Africa, America and Europe. Henning<sup>1</sup> has described the clinical syndrome which invariably terminates in death. The etiological agent, although believed to be a virus, has never been described. The disease can be transmitted to cattle by needle passage of spleen/gland emulsions<sup>2</sup>. It has also been adapted to rabbits<sup>3</sup>.

The rabbit-adapted strain affords an easier and more economical means of investigation, and, in view of Mettam's<sup>4</sup> remarks that "The virus must be fairly large and only invisible because of some natural peculiarity . . .", it was decided to make a minute examination of smears and sections obtained from various infected rabbit tissues. Using Castaneda, Macchiavello and Giemsa staining, it was observed that elementary and initial type bodies were present in most tissues, but especially spleen, gland, lung and appendix, which resemble those of the psittacosis group of viruses (Fig. 1). These bodies showed the pleomorphism, colour variation and location as described by Bedson and Bland<sup>5</sup>.

A check was then made on smears and sections of bovine tissues already prepared, and although the virus is present it is much less numerous and more likely to be confused with cellular debris.

An attempt was also made to establish the disease in fertile hens' eggs using 0.2 c.c. of a 10 per cent spleen emulsion from an infected rabbit, but after only two passages in the yolk sac of eight-day old embryos it was unavoidably necessary to discontinue this work for some months. Smears from yolk sac and chorio-allantoic membrane revealed various forms of the virus, but elementary bodies were undetectable.

In view of the fact that psittacosis virus can be stored for some months by placing infected yolk sacs

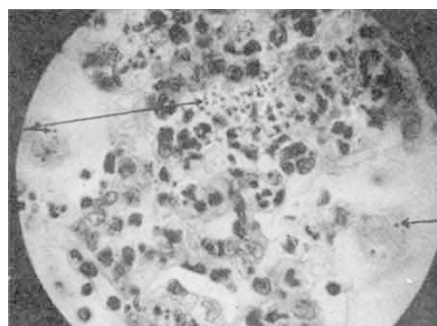


Fig. 1. Rabbit lung stained with Giemsa. Initial bodies, mainly intracellular, are marked by arrows.  $\times 600$

in deep freeze, and despite the fact that the virus of malignant catarrh will only remain viable for one to two weeks according to all previous investigators, it was decided to place one yolk sac in a sterile container in the deep freeze at  $-10^{\circ}\text{C}$ . At the same time the bovine needle passages were also discontinued, but passages in rabbits were maintained. However, after four months from this time (fifty-seventh passage), the rabbits failed to react.

After eight months, when it was possible to resume the work, the frozen yolk sac was emulsified in nutrient broth to make a 10 per cent yolk sac emulsion, and 0.2 c.c. was inoculated into the yolk sac of eight-day old fertile hens' eggs. After a further two passages, 10 c.c. of a 10 per cent whole egg emulsion was inoculated into the prescapular glands of two cattle.

Four weeks later one animal reacted with symptoms associated with malignant catarrh, and this was confirmed by post-mortem findings. A 10 per cent spleen/gland emulsion from this animal was sub-inoculated into a further two animals by the prescapular gland route, and after three weeks one of the animals reacted, again with typical clinical and post-mortem findings associated with malignant catarrh. Using whole egg emulsion from the fourth egg-passage after storage, a further four cattle were inoculated intratracheally. Three reacted in three to four weeks, again with typical symptoms; but one of these, a young native bull, survived. Thus, a complete cycle, bovine-rabbit-fertile hens' eggs-bovine, has been completed.

Natural infections of malignant catarrh have not been recorded at Kabete.

Papers embodying the results of these studies are being prepared and will be published elsewhere.

D. DANSKIN

Veterinary Research Laboratory,  
P.O. Kabete, Kenya.  
April 15.

<sup>1</sup> Henning, M. W., "Animal Dis. in S.A.", 2nd edit., 791 (1949).

<sup>2</sup> Piercy, S. E., *Brit. Vet. J.*, 108, No. 2, 35 (1952).

<sup>3</sup> Piercy, S. E. (to be published).

<sup>4</sup> Mettam, R. W. M., "Snoutsie in Cattle", 9th and 10th Rep. D.V.E. and R. S. Afr., 395 (1923).

<sup>5</sup> Bedson, S. P., and Bland, J. O. W., *Brit. J. Exp. Path.*, 13, 461 (1932).

### New Free Amino-Acids in Plant Materials

RECENT research<sup>1</sup> indicates the presence of 5-hydroxytryptophanic acid as well as possibly hydroxylysine, besides tryptophanic acid and baikiain in the non-protein nitrogenous fraction of plant materials.