By formulæ, the mean value for *nor*adrenaline is 0·25 μgm./ml., while the adrenaline value is zero.

Further evidence that the main active material is *nor*adrenaline is provided by the fact that the post-stimulus samples stimulated the rat's non-pregnant uterus in early œstrus (when nucleated epithelial and cornified cells are in the vaginal smear), whereas adrenaline relaxed this tissue at this stage of the œstrus cycle[5].

Using these methods of estimating the sympathin, we have now stimulated the hepatic nerve in cats after attaching two threads around the inferior vena cava, one above the diaphragm and the other between the liver and the adrenal glands. Blood samples, taken from the hepatic vein via a syringe and a No. 13 needle[6], were centrifuged and tested on the preparations described above. The active adrenergic material was *nor*adrenaline, which may be found in the blood of the hepatic vein in concentrations up to 1·05 μgm./ml. plasma. In addition, in two out of twelve experiments, adrenaline in quantities less than 0·003 μgm./ml. plasma has been detected and estimated.

We are proceeding with the investigation in an attempt to identify the sympathin liberated by other adrenergic nerves. The work would not have been possible without the technical assistance of Mr. G. Ayerst, to whom our thanks are due.

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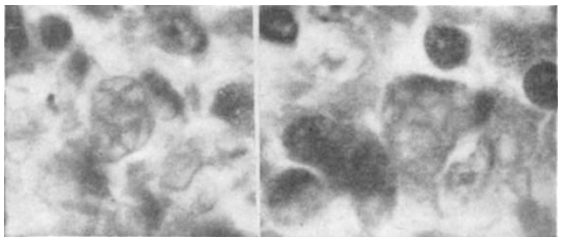
Secretion of Red Blood Corpuscles as Seen in the Camel

WE have been fortunate enough to receive some camel organs which enabled us to proceed with the research on red blood corpuscle secretion in this animal and to complete our previous studies on its eosinophil cells[1]. Some interesting observations were made in the liver, spleen and gastric and intestinal mucosæ.

In the spleen, the development of the eosinophil can be studied at its best, and cells of different sizes can be found containing granules in various stages of evolution, some being fully matured red blood corpuscles. The diameter of some of the cells has been calculated to contain more than twenty of these mature red-blood corpuscles, and it is a remarkable fact that, in spite of their size, some of the granules always retain their oval shape (see photomicrographs). A large number of mononuclears have been found, some of them having a lymphocytic nucleus and containing one or two fully developed red blood corpuscles.

In the liver, occasional eosinophil cells can be seen; but in this organ it is not possible to demonstrate the presence of very large cells in the process of secretion.

The gastric mucosa of the camel enabled us to show that the eosinophil can be linked with the



Camel spleen. Blood-secreting cells in different phases of secretion. Notice the oval shape of the granules

oxyntic cells, as we have established in other animals, especially the Herbivora (cow, sheep and horse). In the camel, however, the oxyntic granules are not so large as they are in the latter animals, and it is more difficult to see them developing *in situ*. If the granules are studied carefully and individually, it soon becomes apparent that they are not round in shape; but some have a definite oval appearance. Similar observations apply to the Paneth cells in the small intestine, and in this organ the eosinophils can be found in large numbers at the top of the villi.

This evolution of the eosinophil upholds the secretion of the red blood corpuscles as against the accepted theory of phagocytosis; for if this latter theory were correct, the red blood corpuscles would not require to keep their oval shape or to shrink in size before destruction. Hence the view that fully matured red-blood corpuscles are evolved from the eosinophil is easier to understand than the phagocytosis of the red blood corpuscles which causes the cell to shrink and become an eosinophil.

This work has been made possible by the collaboration of Mr. J. R. Evans, of the Sudan Veterinary Service, and the kindness of Dr. D. O'Brien, who sent me some camel organs spontaneously from Somalia.

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Relation between Vitamin B_{12} and the Red Blood Cells

THE chemistry and biochemical function of vitamin B_{12} are at present the subject of intensive study. A feature which distinguishes this substance from other therapeutic agents is its effectiveness in very small amounts. While the amount which is adequate for the treatment of pernicious anæmia in relapse varies in individual cases, an initial dose of about 10 gamma (that is, 10^{-2} mgm.) is generally effective. The smallness of these effective amounts has aroused comment; but a simple calculation (as follows) shows that the quantities of B_{12} required appear to throw some light on its significance in the blood picture.

The number of B_{12} molecules in 10 gamma can be calculated from the following equation:

$$\text{No. of molecules} = \frac{\text{Wt. of 10 gamma in gm. (gm. mol. No.)}}{\text{Mol. weight } B_{12}} = \frac{10 \times 10^{-3} \times 10^{-3} \times 6 \times 10^{23}}{1{,}300} = 5 \times 10^{15}.$$