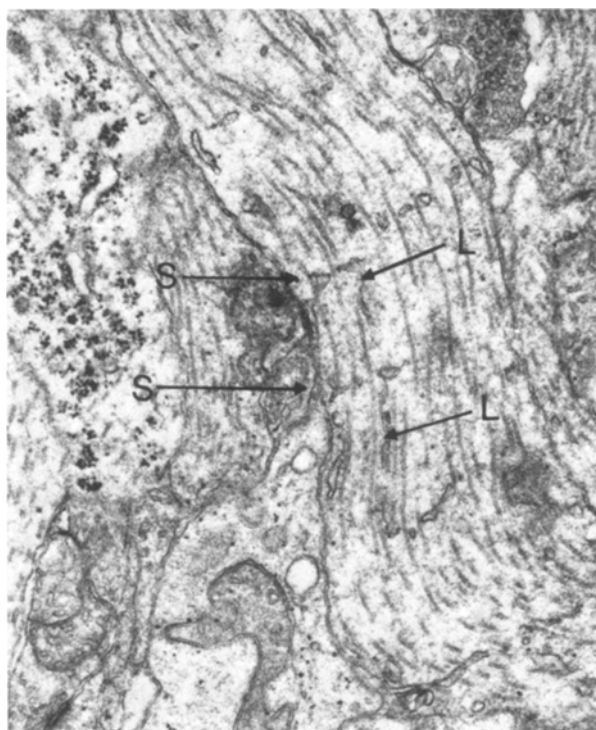


a) Längsschnitt durch Nervenfasern des Bulbus olfactorius mit Septen (S) und Poren, die von Neurotubuli (Nt) durchzogen werden. $\times 24,500$.

Schnittserien ergibt sich, dass diese Strukturen den Faserquerschnitt flächenhaft durchziehen und somit die Form von Platten oder Septen annehmen. In dieses, aus parallelen Membranen des endoplasmatischen Retikulums bestehende System sind Poren mit einem Durchmesser von 300–700 Å eingelassen, die jeweils von einem längsverlaufenden Neurotubulus durchzogen werden. Benachbarte Septen können durch ca. 300–500 Å weite Röhren, die parallel zur Faserlängsachse verlaufen, miteinander kom-



b) Tubulöse Längsverbindungen (L) zwischen den Septen (S). $\times 24,500$.

munizieren (Figur 1, b). Diese Längsverbindungen sind nicht durch Poren unterbrochen.

Die Strukturen werden an Fasern mit einem mittleren Durchmesser von 1,5 μm gefunden; ihrer Lage und Grösse entsprechend dürfte es sich hierbei um Fortsätze von Mitralzellen handeln.

Vergleichbare Befunde wurden bisher lediglich an Nervenfasern verschiedener Arthropodenarten beschrieben². Ihre funktionelle Bedeutung ist unbekannt. Sie könnte einmal in einer mechanischen Verfestigung der Faser liegen, zum andern aber auch eine Rolle beim Axoplasma-transport² oder – in Analogie zum sarkoplasmatischen Retikulum – bei der Ca^{++} -Akkumulation spielen.

Summary. Nerve fibers in the olfactory bulb of the minnow with a mean diameter of 1.5 μm contain transversally arranged membranous septa with a periodicity of approximately 1 μm . These profiles are fenestrated by pores, each of them being occupied by a neurotubulus. The septa are connected by longitudinally arranged membranous tubuli.

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Endocytotic Activity in Lizard Erythroblasts

In the study of the ultrastructure of the malaria parasites of lizards, we have observed pinocytotic vesicles in polychromatophil erythroblasts. Since immature red cells appear in lizards that are experimentally infected with malaria¹, and since these cells also show a sharp increase in acid phosphatase activity², we have investigated whether the ingestion of foreign material and the produc-

tion of lysosomes occur in similar cells from lizards experimentally rendered anaemic.

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Materials and methods. Two uninfected 30 g adult *Tropidurus torquatus* (Iguanidae) were exposed, on 7 separate occasions, to the bite of a fourth-stage larva of *Rhodnius prolixus* (Triatominae). The insects were allowed to feed to repletion and the ingested blood was immediately taken from the insect gut for haematological examination. For each sample, the red cells were counted, the haemoglobin was measured by the cyanmethaemoglobin technique read at 540 μm , and smears were made for staining by the BARKA-ANDERSON³ technique after fixing with cold acetone and followed by staining with 15% Giemsa at pH 7.2, for the purpose of studying the acid phosphatase activity in the red cells and for estimating the number of normocytes. 2 anaemic and 2 untreated lizards were injected i.m. and i.p. with 0.15 ml of Imferon. 2 h before the injection and 4, 16, 24, 48, and 72 h afterward, blood smears were made from all the lizards. One series of smears was stained with alcoholic PAS⁴ followed by Perl's reaction, in order to study the fate of the iron-dextran in the red cells; the other series were stained for acid phosphatase activity followed by Perl's reaction, in order to locate simultaneously the enzymatic activity and the ferric iron in the red cells.

Results and discussion. In the lizards progressively bled by *Rhodnius prolixus*, the red cell count fell from 1.1 million and 960,000 to 560,000 and 410,000 respectively. Haemoglobin values declined from 8.3 and 7.1 to 2.0 and 3.4 g/100 ml of blood. The periodic bleedings caused a gradual decrease in the number of normocytes and a progressive increase in the number of immature red cells showing acid phosphatase activity (Figure); this activity was visible in one of the poles of the cytoplasm of the erythroblast, appearing as a definite pink area, or as a group of minute red granules surrounded by a pink area. Normal lizards showed acid phosphatase activity in a very low percentage of the erythrocytes, and there was no quantitative or qualitative modification due to the injection of Imferon. In treated animals, 12 h after the injection of Imferon there commenced to appear in the cytoplasm of the red cells 1–6 coarse granules, 1.5–2.0 μm in diameter, stained intensely red. At 48 h, nearly 50% of the red cells showed this type of intense acid phosphatase activity, and at 72 h it began to disappear. The PAS reaction occurred in the form of granules or vacuoles

of smaller size; Perl's reaction was more definite and accompanied the PAS reaction in the red cells. Perl's reaction, used as a marker for the iron-dextran, was observed in nearly all the zones in which acid phosphatase activity was taking place, and was never observed without this activity.

The results described above suggest that the pinocytotic vesicles of the polychromatophil erythroblasts are sites of active ingestion of foreign materials, such as iron-dextran. It is also suggested that their presence in the cytoplasm is accompanied by the activation of acid phosphatase of the erythroblast, which may be interpreted as a lysosomal-type response^{5–8}, similar to that which occurs in the hepatic cells of mice treated with dextran⁹ and in the muscle, spleen, and kidney of rats injected with Imferon⁶.

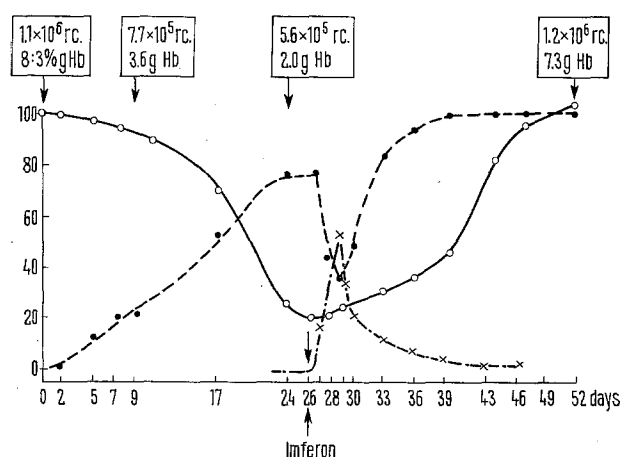
The phenomena reported here are of particular importance because they occur in a cell that is highly specialized, or at least in the process of differentiation towards a type of 'corpuscle' which has an almost fully-developed haemoglobin-synthesizing apparatus¹⁰ by the end of the basophil erythroblast stage, and must be supposed to be furnished with a stable 'messenger' RNA specific for the production of haemoglobin^{1, 2, 4, 7, 8}.

We believe that the polychromatophil erythroblasts of lizards, due to their ready availability, their homogeneity of population, and their possibility of being maintained in vitro, may come to serve as cellular models, not only for study of endocytotic activity and mechanisms of activation and synthesis of acid phosphatase as described here, but also for study of activity of exocytosis, as we have reported elsewhere^{3, 11}.

Zusammenfassung. In Eidechsen-Erythroblasten mit Blutungsanämie wurden elektronenmikroskopisch Zellorganellen und eine aktive Pinocytose nachgewiesen bei gleichzeitiger Aktivitätssteigerung der sauren Phosphatase, die durch Eisenzufuhr noch verstärkt wurde.

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Blood changes in a lizard rendered experimentally anaemic by progressive bleeding, and treated with Imferon on the 26th day after the bleeding. ○, percentage of normocytes in the peripheral blood; ●, percentage of red cells showing diffuse, weak, localized acid phosphatase activity in the cytoplasm; ×, percentage of red cells showing intense, granular acid phosphatase reaction appearing after the injection of Imferon.

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¹¹ Acknowledgments. The authors express their gratitude to Prof. A. G. E. PEARSE for his criticism during the realization of this work and the revision of the manuscript; to Prof. P. C. C. GARNHAM for his advice and facilities for doing it. We also thank Mr. IAN McLURE for his help in the translation of Spanish into English.

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¹³ Dr. C. C. MONTEIRO carried out this work with the aid of a grant from the Gulbekian Foundation, Lisboa (Portugal).