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Observations on the Kurloff Bodies in the Blood of Guinea Pigs.

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Kurloff[1] first described granular inclusions within the cytoplasm of what he called lymphocytes in guinea pigs' blood. It was shown subsequently that the cells containing these bodies were monocytes.[2] Wright's stained blood smears reveal the Kurloff bodies as dark red, homogeneous masses in the cytoplasm. Although many workers have observed and studied these inclusions, little is known concerning their origin and function. They appear to be found only in the blood of guinea pigs.

Bender and DeWitt,[3] while studying the blood picture of tuberculous guinea pigs, observed that their normal control pigs showed an unexpected eosinophilia. At the same time, Kurloff bodies appeared in the blood. They decided that there was a relationship between eosinophilia and Kurloff bodies. They were able to reduce the eosinophiles with mercurial medication, but not the number of Kurloff bodies.

During an investigation[4] of eosinophilia in trichinous guinea pigs about 3 months old obtained from one source, I observed the number of Kurloff bodies in several hundred Wright's stained blood smears. The cells were counted 3 times a week for 6 to 8 weeks. All the animals had Kurloff bodies in their blood when first examined. Six normal control pigs had varying levels of eosinophiles. There was a definite, direct relationship both in the healthy and infected pigs between the number of eosinophile cells and the number of Kurloff bodies in the monocytes so that the high levels of eosinophile cells were accompanied by the greatest number of Kurloff bodies. It was possible to reduce markedly the number of eosinophile cells in trichinous animals by a staphylococcus infection, but this did not essentially affect the number of Kurloff bodies. Eight trichinous animals injected with virulent tubercle bacilli showed the same tendency for a reduction in eosinophiles, while the Kurloff bodies maintained their original level.

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1 Kurloff, cited by P. Ehrlich and A. Lazarus in *Specielle Pathologie u. Therapie*, edited by H. Nothnagel, Wien, 1898, VIII, 56.

2 Bender, L., *J. Med. Research*, 1934, **44**, 383.

3 Bender, L., and DeWitt, L. M., *Am. Rev. Tuber.*, 1923-24, **8**, 138.

4 Spink, W. W., *Arch. Int. Med.*, 1934, **54**, 805.

Of considerable interest were the findings in animals infected with the protozoa, *Trypanosoma equiperdum.* Although these animals maintained a moderately high level of eosinophile cells, there were few or no Kurloff bodies in their blood. This may be explained by the fact that in this infection there is a lymphocytosis and the monocytes are few. This relationship between the level of the monocytes and Kurloff bodies was not constant in all of the preceding animals mentioned.

These observations not only confirm the work of Benedict and De Witt, but also demonstrate that an acute bacterial infection in guinea pigs can reduce eosinophile cells but not the number of Kurloff bodies. However, if an infection results in reducing the number of monocytes as in Trypanosomiasis, the Kurloff bodies are also reduced and may become absent. In conclusion, although there appears to be a numerical relationship between the eosinophile cells and Kurloff bodies in guinea pigs' blood, the absolute number of Kurloff bodies is dependent upon the level of the monocytes.

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Reciprocal Relationship of Copper and Iron in Blood. Polycythemia Vera.

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We have already reported the blood iron content of the adult to be an average of 50 mg. per 100 cc. for men and 45 mg. per 100 cc. for women, and the blood copper 0.132 mg. or 132 micrograms per 100 cc. for men and women.[1, 2] In determining the blood iron and copper in various pathological conditions accompanied by anemia, we observed an inverse relationship between the copper and the iron in the blood. As the blood iron fell, the blood copper rose. Hypercupremia was the usual response to hypoferronemia.[1, 2]

We have already reported the blood findings in a white woman, age 60, suffering from polycythemia vera.[2] We now report another case which verifies our first findings. The aim of the treatment in vogue in this condition, which is manifested by an increase in the red cell count beyond the normal, is to cut down the number of red cells

1 Sachs, A., Levine, V. E., and Appelsis, A., *Arch. Int. Med.*, 1933, **52**, 366.
2 Sachs, A., Levine, V. E., and Fabian, A. A., *Arch. Int. Med.*, 1935, **55**, 227.