Western New York Section.

Clifton Springs Sanitarium, October 21, 1933.

7057 P

Effect of Atebrine on Avian Malarias.*

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Atebrine is a new anti-malarial drug recently developed in Germany, first tested on avian malaria, and the results reported by Kikuth.[1] He used *Plasmodium praecox, elongatum* and *circumflexum,* and *Haemoproteus orizivorae* (a parasite of the rice-finch), and found that it was effective in all cases, but that it would not sterilize malarial infections. Used with plasmochin, however, it either prevented relapses entirely or very much delayed them in the case of *Haemoproteus.* Whether any of the latter cases were sterilized is not stated. He concluded that atebrine is particularly active against the schizonts, in contrast to plasmochin which works best against the gametocytes.

The work herein reported deals only with the effect of atebrine on *Plasmodium rouxi, circumflexum,* and *cathemerium.* The purpose has been to discover whether clearly marked specific differences, such as those already demonstrated by the author[2, 3, 4] for plasmochin and quinine in the case of these 3 species and 2 others *(elongatum* and *praecox),* could be demonstrated for this drug also, and to determine as accurately as possible how the latter compared in effectiveness with quinine and plasmochin.

The drug has been administered orally in all cases, and the period of treatment has varied from 7 to 9 days (as compared with 2 weeks, or sometimes longer, in the experiments with the other drugs cited above). The treatment period was shortened because the drug ap-

* The author desires to acknowledge his indebtedness to the National Research Council for financial assistance.

[1] Kikuth, Walter, *Deutsche Med. Wochensch.*, 1932, **14**, 1.

[2] Manwell, R. D., *Am. J. Trop. Med.*, 1930, **10**, 379.

[3] Manwell, R. D., *Am. J. Trop. Med.*, 1932, **12**, 123.

[4] Manwell, R. D., *Am. J. Trop. Med.*, in press.

peared to cause lesions about the mouth but the birds recovered promptly after administration of the drug was stopped. The dosage used was 2 mg., dissolved in 100 cm. of water, and this amount was given twice a day. The results were checked by periodic blood examinations extending over a period of 2 months (3 months in the case of *Plasmodium rouxi*), and by subinoculation of blood from the treated birds into clean birds, when it appeared that no relapses occurred during the period of observation. Female canaries were used in all cases. Some birds were treated during the incubation period, others during the acute stage, and (in the case of *Plasmodium rouxi*) some were given repeated doses of parasites during the period of treatment in order to determine the value of the drug as a prophylactic against this type of infection. All infections were produced by blood inoculation.

The results can be briefly summarized. It was not possible in any case to prevent or cure infections with *Plasmodium circumflexum* and *cathemerium,* but atebrine appears to be a perfect specific against infection with *Plasmodium rouxi,* at least when parasites are introduced by blood inoculation. No bird (of the 16 treated) developed any infection afterward. It is recognized that the series was relatively small and work is being carried on, both with the other species and additional cases of *rouxi,* but the results are so consistent that it is believed that they are significant enough to report. So far the treatment of mosquito-induced infections has not been tried, and it is quite possible that the results of this sort of therapy would be different, in view of the experiments recently reported by Russell and Nono[5] and Tate and Vincent.[6] Including controls, 50 birds have been used in the work on which this paper is based. Twenty-one were used in the case of *Plasmodium rouxi,* 19 of *cathemerium* and 10 of *circumflexum.*

[5] Russell, Paul F., and Nono, Andres M., *Phil. J. Sci.*, 1932, **49**, 595.

[6] Tate, P., and Vincent, M., *Parasitology*, 1933, **25**, 96.