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of 50,000 primary groin hernias were recorded during a 22-year period and only 975 cases (per cent.) were femoral hernias (Glassow, 1970).

The principles of management of groin hernia in Africa are the same as elsewhere. The Bassini operation of herniorrhaphy is eminently suitable for all cases of direct or indirect inguinal hernias.

SUMMARY

A review of 494 cases of groin hernia, including inguinal hernias constituted the largest hernia type. Femoral hernias and direct inguinal hernias were less frequent than that recorded in most studies elsewhere. Amongst Southern Africans inguinal hernia would appear to be more prevalent in Mtoko and Mount Daru areas. Inguinal hernias occurred more frequently on the right side. There was an unusually high incidence of associated hydrocoele in adult patients with an indirect hernia.

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Filariasis in Rhodesian Wild Life

BY

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Parasitic infections in both man and animals are of considerable importance in the Far East and, in certain parts of Africa, are important infections in man.

In Southern Africa there has not been any mention of economic importance described in domestic animals caused by a filarial worm. Two cases of meningeal setariasis have been reported in antelope (Basson *et al.*, 1966) and cutaneous lesions occur in black rhinoceros (Schultz and Sage, 1960). In view of the current interest in filariasis in humans in Rhodesia, and the fact that this condition is now accepted to be a zoonosis in other countries, some results of observations on filarial infestation in Rhodesian wild life are reported below.

MATERIALS AND METHODS

During the last three years collections of helminths, formalised blood and blood smears have been made from wild animals shot during game trapping operations in Rhodesia. Formalised

blood samples were centrifuged to concentrate microfilariae, and smears were examined after staining with Giemsa.

Results

A wide variety of animals were found to be infected with adult filarial worms and/or microfilariae (Table 1).

DISCUSSION

Members of the genus *Setaria* are easily found in the peritoneal cavity of their hosts. Other genera, living in the skin or lymphatic system, are less well known. In human filariasis the microfilariae are better known than the adults and the worms are usually classified according to the characteristics of their microfilariae.

Amongst our records are some observations on microfilariae exuded by gravid female worms. In one case adult *Setaria scalprum*, from both duiker and steenbok, were seen to liberate unsheathed microfilariae 150  $\mu$  long. This example appears to be an exception in the genus *Setaria*, whose other members all produce sheathed microfilariae. *Setaria scalprum* from the duiker would appear to be a heretofore unrecorded host-parasite relationship (Yeh, 1959; Basson, 1966).

*Setaria hornbyi* with 270  $\mu$  long, sheathed microfilariae, was confined to members of the sub-family *Oryzinae*. *S. bicornata* with 200  $\mu$  long sheathed microfilariae was found in *Reduncinae* and *Tragelaphinae*; *S. africana* in *Bovinae*, *Tragelaphinae* and *Rhinocerotidae*. The

Table 1  
HOST PARASITE LIST OF FILARIDS FOUND IN RHODESIAN WILD LIFE

Host	Adult	Microfilariae from Blood Concentration	Number Positive (x Numbers Examined)
Buffalo	<i>Artibeomma atricana</i> 4. <i>labiato papillosum</i> (F. liberating sh. microf. hl. 240 $\mu$ )	24 samples negative	
Bush buck	<i>S. africana</i> (with F. liberating sh. microf. 330 $\mu$ long) <i>Cordophilus sagitta</i>	1 only sheathed 225 $\mu$	1/1
Duiker	4. <i>scalprum</i> (F. liberating unsh. microf. 150 $\mu$ )	Microf. 160 $\mu$ unsh.	1/3
Eland	4. <i>hornbyi</i> 4. <i>atricana</i>	No samples	
Elephant	<i>Dipetalonema boxidentis</i>	Microf. 290 $\mu$ sh.	1/2
Grysbok	No samples	Microf. 164 $\mu$ unsh.	1/1
Impala	4. <i>scalprum</i>	Unsh. microf. 160 $\mu$ (Max. No. = 5,000/ml. blood)	1/130
Kudu	4. <i>atricana</i> (with F. liberating sh. microf. 330 $\mu$ ) <i>Cordophilus sagitta</i>	Microf. sh. 230 $\mu$ Microf. unsh. 260 $\mu$	1/5 1/25
Reedbuck	4. <i>bicornata</i> (F. liberating 220 $\mu$ microf.)	Microf. 220 $\mu$	1/4
Rhinoceros	4. <i>atricana</i>	6 samples negative	1/6
Roan	4. <i>hornbyi</i>	No samples	
Sable	4. <i>hornbyi</i> (F. liberating 270 $\mu$ microf. sh.)	2 samples negative	1/2
Steenbok	4. <i>scalprum</i> (F. liberating 160 $\mu$ microf. unsh.)	No samples	
Water buck	4. <i>bicornata</i> (F. liberating 200 $\mu$ microf.)	No samples	
Zebra	<i>Setoria equina</i> (F. liberating sh. microf. 220 $\mu$ )	No samples	

microfilariae associated with *S. africana* were 330  $\mu$  long, with sheath.

*Cordophilus sagitta* was found in bushbuck and to be very common in kudu, appearing in 55 per cent. of 64 animals sampled from all major game concentrations; the microfilariae would appear to be sheathed and 230  $\mu$  in length.

The finding of 2 x 260  $\mu$  microfilaria in the kudu could not be associated with an adult of the genus *Setaria*.

Buckley (1958) described experiments which clearly supported the theory that pulmonary tropical eosinophilia in humans was caused by filarial parasites of animals. In America, Beaver and Orihel (1965) reported 21 cases of zoonotic

filariasis. These include infestations in humans of *Dirofilaria immitis*, the common heartworm of dogs.

Nelson (1965), in review, suggests that *Dipetalonema perstans* might be a complex of several species. The wide range of sizes of *A. perstans* type microfilariae found in humans in Rhodesia by Holmes *et al.* (1969) lends support to Nelson's suggestion.

A description of cerebral filariasis possible due to *A. perstans* (Dukes *et al.*, 1968) has raised doubts that this parasite is harmless.

The subject of human filariasis and filariasis as a zoonosis is therefore not at all clear. Microfilariae of animal origin could well play a role

significant part in filarial infestations of humans in Rhodesia.

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## Unusual Manifestations

occurring in the Early Stages  
of Bilharziasis in Children\*

## THE EXPANDED KATAYAMA SYNDROME

BY

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The early systemic or invasive stage of bilharziasis has usually been described as Katayama fever, characterised by a constitutional illness with fever, urticaria, splenomegaly, cough and eosinophilia occurring between the fourth and tenth week of bilharzial infestation. It has usually been regarded as a minor illness,<sup>1, 2</sup> but recent experience indicates that potential serious lesions occur at this stage of the disease with neurological and cardiac manifestations differing from those recognised in the later stage of the disease.<sup>3</sup>

Recent experience also suggests that symptoms more varied than the more commonly described ones may occur, including features of the Henoch-Schonlein's syndrome. It is also possible that the manifestations of allergy or hypersensitivity continue for a considerable length of time. These perhaps also occur later after the initial infection.

This paper is based on nine cases illustrating these features, and these patients fall into two groups, the first group comprising cases showing cardiac and/or cerebral complications and the second group showing features of the Henoch-Schonlein's syndrome. All these patients were white children.

## GROUP I: CASES WITH CEREBRAL AND/OR CARDIAC ABNORMALITIES: RECOGNISED CLINICALLY OR ON SPECIAL INVESTIGATIONS

*Case 1.* An 11 year old boy presented with a week's story of fever, headache, malaise and rigors. Other features were: temperature 103° F., 3 cm. splenomegaly and eosinophilia of 14 per cent., E.S.R. 37 mm. hour and a positive schistosoma-plasma-cercaria antigen (S.P.C.) screening test. An E.C.G. showed T wave inversion from VI-V6. The eosinophil count subsequently rose to 54 per cent. and persisted for two months. Bilharzial tubercles were shown on cystoscopy. The E.C.G. abnormalities persisted for two months. Subsequent progress after anti-bilharzial treatment (sodium antimony tartrate) was good.

*Case 2.*—A seven-year-old boy developed oedema of the scrotum and penis one month after known exposure to bilharziasis. He subsequently developed generalised urticaria lasting for one month followed by a fever, vomiting and diarrhoea with blood in the stools. Three weeks after the initial symptoms, features of an acute encephalopathy appeared. Other findings were an eosinophilia of 32 per cent., a high-pitched systolic murmur, E.C.G. changes consisting of T wave inversion from VI-V7 with depression of the ST segments in VI-V6. An E.E.G. showed abnormal slowing over both occipital areas, with changes more marked over the right side. Splenomegaly developed during the course of the illness. Ova of *S. mansoni* were found in the stools one month after the initial symptoms. The murmur and E.C.G. changes lasted for 24 days. The E.E.G. abnormalities persisted for five months. Subsequently, on treatment with sodium antimony tartrate, there were no E.C.G. abnormalities.

*Case 3.*—A nine-year-old girl presented with a three weeks' fever and one week's coughing. Relevant findings were an eosinophilia of 30 per cent., E.S.R. 83 mm. hour, E.C.G. showing inversion of T waves from VI-V6, with prolongation of the corrected Q.T. interval and right axis deviation. An E.E.G. showed an abnormal low voltage record with slow activity over both parietal areas. Ova of *S. haematobium* were found in the urine 33 days after the commencement of the illness. The E.E.G. abnormalities lasted for 10 weeks. Though the E.C.G. improved, it was

\*Based on a paper presented at the Rhodesia Medical Congress, Bulawayo, 22nd August, 1968.