

This type of leukaemia is uncommon in childhood and its incidence has been estimated by various authors to be between 1% and 5% of all childhood leukaemias. EISENBERG and WALLERSTEIN (1934) found only 32 cases in the world literature when they reported a case in 1934. In the next 30 years approximately 100 further cases were reported (HARDISTY, SPEED and TILL, 1964). Most of these cases have been white children and few Negro cases have been reported. COOKE (1953) described 15 children with chronic myelocytic leukaemia seen over a 20 year period, one of whom was a Negro. HARDISTY et al., (1964) reported 8 cases of which one was a Negro, and LOTHE (1967) reported chronic myelocytic leukaemia in 4 young Ugandan Africans, 2 in the 10-14 year age group and 2 in the 15-19 year age group.

2 of the 3 African children with chronic myelocytic leukaemia seen in this hospital were typical examples of the adult type of the disease, but the third, in which the Philadelphia chromosome was demonstrated, had marked lymph node enlargement and haemorrhagic symptoms which are features more usually associated with the juvenile variety of the disease.

I am, etc.,  
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22 September, 1971.

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#### SIZE OF TOXOPLASMA MEROZOITES

SIR,—According to the report of ZAMAN and COLLEY (1970) the length of *Toxoplasma* merozoites ranged from 7-10  $\mu$ . In the paper by HUTCHISON et al. (1971) the range is  $4.9 \pm 1 \mu$ . In my opinion this difference is mainly due to the fact that I measured the merozoites along their arc and not as a straight line from two points, as was done by Hutchison (personal communication). HUTCHISON et al. (1971) measured their merozoites inside the schizonts while I measured them outside the host cells, in impression smears made from infected cat ileum. It is, therefore, possible that some early trophozoites may have been included in the higher range given by me.

I am, etc.,

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24 September, 1971.

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#### THE CONTROL OF *SCHISTOSOMA HAEMATOBIIUM* IN WEST CAMEROON

SIR,—The feasibility of controlling the transmission of *Schistosoma haematobium* by the combined use of N-trityl-morpholine (Frescon-Shell) against the vector snails, and niridazole (Ambilhar-CIBA) for the mass treatment of the parasite in man, has been under investigation in West Cameroon for 3 years. As the full results of the trial will not be available for another 3-4 years we ask the favour of your columns to give a short progress report.

The two foci of urinary schistosomiasis in West Cameroon lie on the crater lakes of Barombi Mbo and Barombi Kotto. They were discovered by ZAHRA (1953) and are isolated from other centres of transmission by about 80 km.

Mbo village (pop. 160) lies near the shore of the lake, which is 2 km. across and up to 100 m. deep. Transmission takes place only on a shallow weedy shelf extending out about 50 m. along 600 m. of coastline near the village. The vector is *Bulinus rohlfsii*. The water is clear and of pH 6.3-7.0.

Kotto includes a village of 600 inhabitants on an island in the lake and a further 800 persons living on the mainland. The lake is 1 km. across and nowhere more than 20 m. deep. The water is turbid, greenish brown in colour, heavily polluted with sewage and of pH 9.0+. The vectors are *B. rohlfsii*, confined to certain island beaches, and *B. camerunensis*, which is abundant along the whole coastline. Both species are bottom-dwellers usually found on dead leaves. Transmission takes place at the 22 beaches on the island and mainland.

At both lakes regular 3-weekly pre-and post-control surveys were made by trapping snails in baskets filled with decaying *Alchornia cordifolia* leaves, and also by quantitative hand-picking methods. All snails over 3 mm. long were crushed and examined for mammalian schistosome cercariae.

Frescon was applied from a boat using a motor pump and a long delivery tube so that the emulsion could be layered over the bottom of the lake to give a final dilution of 2 parts per million of N-Trityl-morpholine throughout the bottom 0.5 m. of water extending out to the 1.5 m. depth line. The high concentration of mulluscicide was necessary to counteract the effects of drift caused by along-shore currents. Treatment was applied to all the transmission beaches and to a 50 m. barrier on either side of them, i.e. to 700 m. of coastline at Mbo, and 2,400 m. at Kotto. The snails outside the treated areas remained undisturbed.

As Frescon does not kill snails' eggs, double applications were made, with 12-14 days between applications, and these were repeated every 3 months. Later the schedules were changed to single applications made once every 6 weeks, an empirical method which has given even more successful results.

Although some small fish were killed by the concentrations of Frescon used, most escaped into the enormous volume of untreated water remaining open to them. There has been no fall in the village fish catches, and as drinking water comes from neighbouring streams there was no risk of human poisoning.

The effect of control measures on the parasite in its vectors is shown in the Table.

	Barombi Mbo			Barombi Kotto		
	Before	During	After	Before	During	After
No. of examinations*	12	6	38	24	6	18
No. of snails of dangerous age/examination†	64	2	6	459	34	168
No. of infective snails/examination‡	2.4	0.0	0.0	16.4	1.3	0.6

\* Made every 3 weeks.

† *B. rohlfsii* and *B. camerunensis* over 3 mm. long and hence of an age to be potentially infective.

‡ Containing mammalian schistosome cercariae when crushed.

Before starting mass treatment at Mbo and Kotto, about 1,000 of the inhabitants of 15 other mainly Barombi villages who occasionally visit the lakes were surveyed qualitatively, and some 200 egg-passers were treated. Mass treatment at the two lake villages began 2 months after snail control had been achieved. For each villager a count was made before treatment of the total viable *S. haematobium* eggs in the whole volume of urine passed over 2 hours about midday. Ambilhar was then given to all egg-passers at 25 mg./kg. per day

for 7 days in two equal doses morning and evening, usually after food. Over 99% of persons agreed to take the tablets, which were always swallowed in the presence of the distributor. The drug was well tolerated apart from some vomiting and intestinal colic, which responded to the routine antidote of belladonna and phenobarbitone tablets B.P.C. No cerebral or psychiatric disturbances were seen, but the treatment of some pregnant and nursing mothers was delayed. Subsequent to treatment snail control has been maintained, the human population has been resurveyed at intervals, and all new or relapsed egg-passers have been treated.

The periods concerned are designated "Before" (i.e. before control operations started), "During" (i.e. from the first Frescon application to a month after the completion of Ambilhar treatment), and "After" (i.e. subsequent to the foregoing). Taking account of the fact that the "After" control figures are derived from a snail population growing exponentially, which has been sampled regularly 3 and 6 weeks after being reduced to near-zero by Frescon application, we estimate that the number of snails of potentially dangerous age (i.e. over 3 mm. in length, and capable of harbouring cercariae) has been reduced to 1/30th of the pre-control figure at Mbo and to 1/10th at Kotto. Likewise the number of snails harbouring mammalian schistosome cercariae has been reduced to about 1% of the pre-treatment level at Kotto, while at Mbo it is below the threshold detectable by our sampling methods.

The effect of control on the parasite in man can be assessed by summing the numbers of live eggs passed by the population in unit time. Before treatment at Mbo the estimated total of eggs passed was 575,000; and after treatment the corresponding figures (including newly arrived egg-passers) were:—2 months, 470 (0.08%); 8 months, 2,240 (0.4%); 16 months, 3,450 (0.6%); and 22 months, 1,470 (0.25%). At Kotto the figure before treatment was 975,000. After treatment the corresponding figures were:—3 months, 4,670 (0.5%); and 8 months, 3,620 (0.4%).

The results demonstrate that (i) snail control on the edge of lakes is feasible using Frescon at 2 p.m. once every 6 weeks; (ii) by first establishing snail control, and following up with niridazole treatment of all egg-passers, a great reduction in *S. haematobium* transmission can be achieved in a few months; and (iii) the use of niridazole for mass treatment of *S. haematobium* can be free from serious hazard and acceptable to the populace.

Our future plans are to maintain snail control and to treat all new or relapsed egg-passers revealed by regular urine surveys. Thus we hope to determine whether the reduction in transmission will have been sufficient to pass the "break-point" (MACDONALD, 1965) for *S. haematobium*, below which the parasite is unable to maintain itself in the community.

We are, Sir, etc.,

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ZAHRA, A. (1953). *West Afr. med. J.*, **2**, 56.

#### THE POSSIBLE MODE OF ACTION OF SOME CHEMOTHERAPEUTIC AGENTS IN GUINEA WORM DISEASE

SIR,—In the last few years 3 drugs, niridazole (RAFFIER, 1969; LUCAS et al., 1969; KOTHARI et al., 1969; REDDY et al., 1969), thiabendazole (RAFFIER, 1969) and metronidazole (PARDANANI and KOTHARI, 1970; ANTANI et al., 1970), have transformed the treatment of guinea worm infection. The general impression has been that the compounds kill the female worms when they emerge through the skin to release their larvae, thus allowing them to be extracted easily and resulting in a marked reduction in inflammation. Their efficacy is surprising, however, in view of their lack of effect against related parasites and con-