At the Harare Hospital Staff Round
Cases of Interest Recorded and Arranged by
J. J. FORBES, M.R.C.P. (Ed.)

AND

JOHN A. GORDON, F.R.C.S. (Ed.)

CASE No. 174—Presented by Professor Michael Gelfand.

To-day I should like to demonstrate, with the aid of Miss Garnett, of the Research Laboratory, some of the work which has recently been done on ankylostomiasis. This disease is quite a problem. Foy and Kondi in East Africa and Gillies in Nigeria have published work showing how serious the hookworm is in those countries, and they regard it as one of the most important causes of anaemia in Africa. We have been interested in the local picture and in just how severe these infestations are. Some people feel it might be a cause of anaemia should the blood picture be that of the hypochromic microcytic type. I decided to investigate these cases to find out whether this was so or not.

There are two types of hookworm in Africa—the Ankylostoma duodenale and Necator americanus. A. duodenale seems to do more damage, fixing itself in the mucosa with its numerous hooks. On the other hand, necator produces a much heavier infestation. It is said that each worm sucks 0.1 ml. blood per day; thus 500 worms remove up to 50 c.c. per day. At one autopsy I witnessed in Kampala we counted over 1,000 ankylostomes. The most I have ever found at autopsy here is 116, but in general about 20 to 30 worms per case. Most were A. duodenale and very few necator. In the published works of Foy and Kondi and Gillie the worm found has been almost entirely necator. Here we find a mixture of both.

May I now present Matinee, who demonstrates this condition. She was referred from the ante-natal clinic nearly 20 weeks pregnant and with a haemoglobin of 35 per cent. (5.39 g. per cent.). The mucous membranes were very white indeed. She was complaining of headache. The house physician naturally assumed that this patient had a folic acid deficiency, but further investigations were necessary. Her M.C.H.C. was 26 Hg. with hypochromasia. A bone marrow aspiration showed a normoblastic anaemia. The picture was that of a deficiency anaemia and hypochromasia. A stool showed the presence of hookworm ova.

The case was thus a complicated one. She was pregnant with a possible iron deficiency anaemia; she had hookworm, and finally her urine revealed she had Schistosoma haematobium infestation. All these would cause an anaemia.

The following table demonstrates the degree of severity of this disease as held by workers in the field. The gram of a 24-hour stool specimen is examined and the number of ova present are counted. This gives the degree of infestation:

<table>
<thead>
<tr>
<th>Number of Eggs</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minima! .............. 700 to 1,000/gram.</td>
<td>Minimal</td>
</tr>
<tr>
<td>Light ............ 1,001 to 5,000/gram.</td>
<td>Light</td>
</tr>
<tr>
<td>Moderate ........ 5,001 to 10,000/gram.</td>
<td>Moderate</td>
</tr>
<tr>
<td>Heavy ........ Over 10,000/gram.</td>
<td>Heavy</td>
</tr>
</tbody>
</table>

Most of our hookworm cases so far could be labelled minimal or even less. The impression is that most cases fall into the group of minimal infection, whereas in Liberia minimal is 44 per cent, and moderate to heavy is 35 per cent. of all cases. In such areas cases are not regarded as very important if the egg count is below 20,000 per gram. Matinee's count is 1,050 per gram. Thus hookworm is a severe and serious disease in other African territories, but is not so here.

In the Research Laboratory we examine the third stage lava presented after hatching the egg to identify the type.

Miss Bridget Garnett: A test tube filter-paper method is employed to recognise Ankylostoma duodenale, Necator americanus and Stercoralis strongyloides. Procedure:

1. Smear some fresh faeces on a strip of filter paper, leaving about 5 cm. at the left end of the paper unsmearled.
2. Add 2-3 ml. of sterilised or distilled water to a test tube.
3. Place the unsmearled end of the filter paper into the distilled water so that it reaches the end of the tube.
(4) Stopper the tube and place it in a constant temperature of 20°-30° for eight to ten days. Optimal temperature, 28° C.

(5) In order to kill the larvae without de-
teriorating the gut, remove the filter paper from the tube and place the tube in a hot water bath at 50° C. for 15 minutes.

(6) The larvae can then be examined and identified.

The identification of nematode and duodenal is easy. A. duodenale has an unstriated cuticle and the oesophagus pouches before entering the gut, while Trichuris has a striated cuticle and the oesophagus is unpouched.

Dr. J. Forbes: Can you give us any idea how many worms are represented by, say, 1,000 eggs/gram?

Professor Gelfand: No, I cannot. We use this table as a gauge of severity of infestation.

In our laboratory we can have the result in half an hour.

The question is, should we treat these infesta-
tions? Probably we should bear in mind that in Africa infestation is a complicating factor in anaemia rather than a prima facie cause of the anaemia. In our past experience even a small infestation is an aggravating factor in anaemia. In this case (Matinee) we have a pregnancy anaemia complicated by hookworm. Incident-
ally, Matinee comes from Malawi, but we are not seeing anything like the dreadful disease found in East Africa and Nigeria, where it is a direct cause of death.

Dr. Daniel Borg: What is your treatment for this disease?

Professor Gelfand: The treatment is Tetra-
iphery, which is given in doses of 5 grams. It is preferable to give this amount two or three times to each case.

THE REHYDRATION UNIT—Presented by
Dr. E. P. Forbes.

The need for rehydration units has been re-
cognised in many African territories over the past few years because we all have one thing in common—to many patients and too few beds or cots. The second reason is that gastro-
enteritis should not be nursed in a general medical ward, but in a fever block or an infec-
tious diseases hospital. Where this is not pos-
able, as at Harare, cross infection is inevitable, particularly as there are two children in many of the cots. At times we have over 90 children in a 60-cot ward, and although we make every effort to segregate those with gastroenteritis in one part of the ward, occasionally a child is put into a cot with the wrong bed-fellow. I have been concerned about the amount of cross infection in our ward, particularly when it occurs in malnourished children who have little resis-
tance, and it is indeed a great tragedy when a child dies from an infection he has picked up in the ward.

In 1964, out of over 2,000 admissions, we had 359 children with gastroenteritis, forming about a sixth of the total number of cases in the ward, and 116 of these died. Most of those who died either had other pathology as well or were very severely dehydrated and moribund on admission. The problem, therefore, is a very real one in the paediatric department, and for some time I have had this rehydration unit in mind.

Last September, when I was in Kampala, I saw such a rehydration unit at the new Mulago hospital, and later in the year I had the oppor-
tunity of visiting similar units at Baragwanath hospital, Johannesburg, and King Edward VIII hospital, Durban. These units function in the out-patient departments and ideally should re-
main open for 24 hours a day. This is the case in the south, but in Kampala the unit closes at 5 p.m., which means that cases seen at night require admission.

Recently the rehydration unit at Harare was started, and at present it is not possible to re-
main open after 5 p.m. Our aim is to rehydrate children by pushing fluids orally and, if neces-
sary, parenterally, because mortality in gastro-
enteritis is more closely related to dehydration than to infection. On admission, oral half-
strength Darrows solution is given and continued hourly by the mother under supervision. Breast feeding is not stopped, but other milk is dis-
continued for 24 hours and solids for a longer period. If vomiting occurs, or if the child is already more than mildly dehydrated, parenteral fluid is given, again using half-strength Darrows solution. The fluid is run intravenously as fast as 200 c.c./hour. As long as we have a few hours to rehydrate a child intravenously, fluids can then be continued orally by the mother at home until the following morn-
ing, when the child returns for re-assessment.

The mothers have been surprisingly co-operative, not only in feeding their children correctly, but also in keeping the child's head still while scalp vein drips are in progress. The staff nurse in charge of the unit is aware of the importance of stressing how desperately the child needs fluid, and the mothers are more likely to continue the regime of frequent oral feeds at home when they have got used to this during the day in the unit. Each mother takes home Darrows tablets which she is instructed to make up with boiled water, and after the second day children who
are not breast-fed are given a supply of skimmed milk powder until their infection is over. A small supply of the antibiotic the child is on is also taken home at night.

Following the Kampala idea, we avoid feeding bottles in the rehydration unit and in the children's ward at Harare, where even the smallest babies are fed by cup and spoon if they are not breast-fed. These utensils are more easily cleaned than bottles, and as milk is an excellent culture medium for bacteria when bottles are imperfectly sterilised, mothers are discouraged from using them and shown that it is possible to feed a child without a bottle.

The following table shows the number of patients who have gone through the rehydration unit in the first four weeks:

| New cases | 110 |
| Re-attendances | 162 |
| Intravenous infusions | 17 |
| Subcutaneous infusions | 17 |
| Admitted later to ward | 6 |

Some children come back once or twice; other more severe cases return three or four times. Only six of the children required admission to the ward eventually. Three of these were on oral feeding, but vomiting was troublesome and they were admitted to the ward for intravenous therapy when the unit closed. The other three on intravenous fluids were not rehydrated sufficiently to send home.

This is a quiet time of the year for gastro-enteritis, but apart from those who were treated with drip infusions, I think we also saved beds on a proportion of the cases given oral fluids by preventing them becoming dehydrated. It will be more obvious when the busy season starts how many children we keep out of the ward.

Lastly, the staff nurse in charge endeavours to carry out health education and gives some instruction to the mothers on making up feeds, disposal of stools, the need for extra milk after nine months of age even though the child is still on the breast, and a suitable solid diet for toddlers. The centre can, therefore, play a small part in the struggle against malnutrition, which is an even bigger problem than gastroenteritis.

Dr. Cowan: I should like to ask Dr. Forbes why she feels these cases should be treated in an infectious diseases hospital. In Kampala and Great Ormond Street they treat these cases in an out-patient unit.

Dr. Forbes: In many of the English hospitals a fever block is available for gastroenteritis, thus keeping them out of general medical wards. In this country, where this is not the case and our numbers are considerable, a unit of this sort is essential.