

EAST AFR. PROT.

ACO
7543
no 5 ft 12

3548

Editor 17
Guard

Date
1912
January

Previous Paper

Sleeping Sickness & Big Game

Sends article by Mr Wootnam and asks for permission to publish it in the "Field". If this is approved asks copy may be sent direct to that newspaper.

20095

614

What Sir G. Fisher

This is a very interesting letter, a powerful plea for scientific caution in dealing with the question of the connexion between game, & the tsetse fly, & the tsetse & some other subjects. But the subject is at present highly controversial & Sir G. Fisher will not wish to give any ground for the allegation that he is yet taking one side or the other. The bias of Mr Wootnam in the matter is evident and natural, and I think therefore that it would be a mistake to let the article appear. It will be known that it could only

Subsequent Paper

5207

of nos 3 of B, and if it were sent
direct to the Field office from here as Sir
P. Girouard suggests, the connexion would
be held to be even more definite.

You should see ⁴¹² ₂₇₅₆₁₁ Nyasaland &
subsequent papers for what has happened
in connexion with this subject during your
absence

Reply expressing appreciation of the
ability & interest of the article, but explain
that owing to the very controversial nature
of the subject, no 3 of B is not able to
approve of its being published in the field.

Signature
4/1/22

2/2/22
2/2/22

Send copy of the concept to the
Director of the S-S Bureau for info
Some of the suggestions as to experiments
may be new & of value

H. J. R.
9/22

Letter W. 10

W 10-2 6.12.22

Sleeping Sickness Surran.

The Royal Society
Burlington House
London W.

February 15th 1911.

Dear Sir,

I have received from official quarters a letter to "The Field" written by Mr. R. B. Woodhead, the Game Warden of the West Africa Protectorate, on the Tsetse fly and its bite. It is not considered desirable that this should be official. It would, I think, be better after this communication, but at the same time the subject matter is valuable and in my judgment calculated to bring a surer knowledge than exists among the general public on this subject. Would you be willing to publish it unoriginally, merely saying that it has been received from correspondence for whose completion I am indebted to the latter official about whose name I need not say more, and receiving a favourable reply from you I will send you the letter.

Yours faithfully,

Director.

The Editor

The Field.

GOVERNMENT HOUSE
NAIROBI.

BRITISH EAST AFRICA.

January 9th 1912.

No.17

(Incl.1)

EAST AFRICA PROTECTORATE

Sir,

I have the honour to transmit an article written by Mr. R. B. Woodnam, Game Warden, on the subject of the preservation of wild animals in Africa with the request that you will grant permission for its publication in the "Field" newspaper.

2. If you approve of the article I would ask you to pass on the spare copy, sent herewith, direct to the "Field" so that publication may not be delayed.

I have the honour to be,

Sir,

Your humble, obedient servant,

GOVERNOR.

The Right Honourable

Lewis Harcourt, P.C., M.P.,

Secretary of State for the Colonies,

Downing Street, London, S.W.

ENCLOSURE

10 Despatch No. 17 of 9/12/1912

Game Warden's Office,

Nairobi,

British East Africa,

6th December 1911.

No. 287/11.

Sir,

I have just received a copy of a Parliamentary Paper (ca. 5775) issued by the Colonial Office in July last, and containing correspondence relating to the Preservation of Wild Animals in Africa.

2. There is some very important correspondence contained in this paper on the subject of Tsetse fly and Big Game and I should particularly like to draw the attention of readers of "The Field" to the letters of Dr. Prentice, Honorary Secretary of the Livingstonia Committee of the United Free Church of Scotland and Dr. A. Bagshaw, Director of the Sleeping Sickness Bureau.

3. Unscientific letters like that of Dr. Prentice are greatly to be deprecated.

4. The sweeping condemnation of the Big Game in this letter will not impress the scientific world nor meet with its support; while it only increases the bitterness and hatred of those who are suffering on account of the Tsetse fly and attribute

The Editor of the "Field",

Windsor House,

Breams Buildings,

London, E.C.

attribute all their troubles to the game and who are rendered powerless to combat the evil by their very ignorance of the subject and have therefore to fall back upon the scientist for help.

5. In contrast to such a letter it is a great pleasure and most reassuring to read the sane scientific statements of Dr. Ragsdale. Here there is no trace of rash statements and hasty doubtful conclusions. The hard facts of what is known on the subject up to the present are taken and it is clearly pointed out that in the face of these facts it would be absolutely unjustifiable to adopt extensive measures of game extermination with the object of clearing a district of tsetse for it would probably not have the desired effect. The Bionomics of tsetse flies, their possible sources of food supply, and the conditions governing their increase and decrease and spread from one district to another are far too imperfectly known at present and until sufficient knowledge is accumulated it is useless to adopt hasty and premature measures.

6. In saying that the game is entirely responsible for the increase and spread of tsetse fly in Nyasaland, Dr. Prentice characteristically ignores the fact that the game existed when man was still only an ape like creature and probably in far greater numbers than at the present day, and that therefore, (the game having been in Nyasaland for so long), the spread of the tsetse fly must be mainly dependent upon some other factor of which we are as yet completely ignorant.

7. The whole question of the relation of game animals and disease both animal and human in Africa is a very

complicated

complicated one and also a very serious one, and I am willing to admit this and it is not my intention to attempt to oppose any measures, necessitating the extermination of game, when it is definitely proved that such measures are necessary in certain districts. But I maintain that too much attention has been concentrated upon the game while the possibility of other animals also being implicated has been almost overlooked by the general public. This applies not only to Tsetse flies and Trypanosomiasis but also to other diseases of domestic animals and man, and in view of these facts it does not seem likely that any useful results will be obtained by exterminating the game and leaving other animals.

b. There are several diseases in which the possibility of wild game and other animals acting as reservoirs or hosts or distributors must be taken into account. These may be classed :-

1. The Trypanosomiasis.
2. The Piroplasmoses.
3. Rinderpest and Gastro-Enteritis class.
4. Intestinal parasites.

(1) Trypanosomes were found in the blood of wild game animals by Bruce in Zululand and by Montgomery and Kinghorn in Rhodesia. But Trypanosomes were also found by Bruce in the blood of *Myaenas* in Zululand, and it is, therefore, reasonable to suppose that other animals than game act as reservoirs in fl. infected areas, and there is no doubt now that Big Game is not the only source from which the Tsetse flies draw their blood supply. This applies also to *Glossina palpalis*

(formerly

(formerly thought to be the only species of *Glossina* capable of transmitting a human Trypanosome), many of which were found on the shores of Lake Victoria to have fed upon Avian or reptilian blood (Hamerton and Bateman). The discovery of Roubaud that *Glossina palpalis* will readily bite large caterpillars is of great importance, for if Tsetse flies can feed upon the fluids of caterpillars it would explain a phenomenon which has always been somewhat of a mystery, namely how it is that in some places there are great numbers of Tsetse flies although vertebrates of any kind are not to be found or are very few in these places. Also in Japan Pryer states that sand flies have been found to feed upon the larvae of other insects, and points out that other larger blood-sucking flies may do the same. (see Sleeping Sickness Bulletin Vol.3 No.31 Page 419 - 420). Besides this it has been proved that sheep and goats and cattle can act as reservoirs for Trypanosomes which are fatal to cattle and that cattle themselves may harbour these Trypanosomes without becoming diseased.

These facts alone show that the extermination of the same animals in a district does not necessarily mean the disappearance of the Tsetse fly, but that a few will be kept alive by feeding upon other animals and when the district is re-stocked with domestic animals, the fly might increase again after a sufficient lapse of time, Tsetse flies being slow breeders as they lay only one pupa at a time. To carry out a really successful experiment on these lines it would be necessary to remove from the area not only the same but all living animals including man, domestic stock and birds.

It must also be remembered that it is highly probable that Tsetse flies (*Glossina*) are not the only blood-sucking flies capable of transmitting Trypanosomes. *Stomoxys* has already been proved to transmit a Trypanosome in Mauritius and the Philippines and other genera such as *Tabanus*, *Haematopota* and *Hippoboscus* are to be treated with the

greatest suspicion.

- (2) With regard to the Piroplasmoses there is no doubt that the game supply some of the blood-which feed the ticks which are the transmitting agents of this class of diseases, but it must be remembered that, with the exception of *Piroplasma equi*, the pathogenic micro-organism causing biliary fever in horses and mules which has been proved to be carried in the blood of Zebras, wild game animals have not been proved to act as reservoirs for the other pathogenic Piroplasms of East Coast Fever and Red Water. On the contrary a tick infected with East Coast Fever is rendered clean by feeding upon a game animal.

- (3) The ultra-microscopical virus of Rinderpest undoubtedly attacks game animals, for it has destroyed thousands, but the closely allied disease Gastro-Enteritis has not yet been definitely proved to be carried by game. There is no doubt that many of the serious outbreaks of Rinderpest in Africa among game animals have been primarily caused by the movements of infected domestic cattle.

- (4) Of intestinal parasites certain ones are found in game, but it is not known that the intestinal parasites of game are zoologically similar to those of domestic animals and consequently capable of transmission the one to the other, and the extermination of the game would certainly not be followed by the disappearance of the parasites.

9. In the fight against the diseases in question there is another point which has not received the attention from the
general

general public that it merits and that is the question of immunity and the possibility of producing it or hastening it artificially. The task of exterminating all animal life in the infected areas and also the insects which transmit the diseases is such a gigantic one that it appears almost impossible, and the prospects of success by producing an immunity appear to many more hopeful. This applies more particularly to the Piroplasmoses, but those interested in the subject should not fail to read "Studies in Immunity" by W. J. Terry, page 310 of Sleeping Sickness Bulletin No. 20, which gives a most interesting account of a long series of experiments with different Trypanosome infections with special reference to the immunity following cure. Some of these experiments gave most encouraging results.

10. It is interesting but not very profitable to speculate upon the past history of immunity in nature. Such parasitical forms of life as Trypanosomes and Piroplasma may have evolved zoologically comparatively recently or may have been recently promoted to a life cycle in the blood-stream of vertebrates. There are many blood parasites known, such as Haemeridia and certain Leucocytozoons, and also certain Trypanosomes which produce no disease in the animals in which they are found at the present day, but they may have caused great mortality among these animals in the past, before their hosts developed an immunity and became tolerant of them.

11. The question of immunity therefore appears to be one of great importance. If wild animals can acquire an immunity in nature and domestic native cattle can also acquire

acquire immunity. Is it not possible that the greatest success may eventually result from an artificially produced immunity.

12. The Commission which is just commencing work in Nyassaland under the direction of Sir David Bruce has in its power the possibility of settling once and for all the burning question of the relation of big game and Tsetse fly and the diseases transmitted by the Tsetse fly. It is to be sincerely hoped that this Commission will therefore concentrate its attention on answering certain primarily important questions, leaving as matters of secondary importance such details as the particular species of Trypanosome with which they are dealing and the symptoms of the disease produced.

13. There are six questions which need answers and until these questions are answered it is impossible to decide upon a definite and practically useful plan of campaign. Briefly these six questions are :-

1. Are game animals the only wild animals which are acting as "Reservoirs" for Trypanosomes?
2. Are the Trypanosomes found in the blood of game animals pathogenic for man and domestic animals, and if so, are not the Trypanosomes found in the blood of other animals also pathogenic?
3. Are Tsetse flies the only transmitting agents of these Trypanosomes in the infected areas?
4. Are game animals the only source from which the Tsetse flies or other transmitting agents draw their blood-supply. And if not what are the other sources of supply?

5. Can Tsetse flies live and breed upon food other than blood, such as plant juices?

6. Is the increase and spread of Tsetse flies dependent upon game alone, and if not what are the governing factors?

14. The first two of these questions can only be answered definitely by carrying out an extensive series of ~~such~~ inoculation experiments and it is essential that the susceptible animals should be inoculated not only with the blood of game animals but also with the blood of all other animals and reptiles in the infected areas.

15. The third question suggests its own necessary experiments.

16. The fourth question is more difficult but will be answered to a great extent by the ~~same~~ inoculation experiments and by the discovery of Trypanosomes in the blood of other animals.

17. For the fifth question I should like to suggest some such experiment as the following:-

That a freshly killed bird or small mammal should be quickly skinned and the skin filled with honey or crushed banana (or some other fruit which could represent "plant juices") which must of course be brought up to blood temperature. The skin might then be pressed against the gause of a tsetse fly cage, to determine whether blood sucking flies can subsist upon such food as honey, or plant juices. Personally I am sceptical of the likelihood of such specialized insects as blood-sucking flies being able

able to breed until they have fed upon blood, but it is conceivably possible that they might exist upon such a diet or upon nothing without breeding for several months.

18. The sixth question is a difficult one but will be greatly simplified when an answer is obtained to the fourth.

19. In conclusion I may say that at present there is not sufficient scientific evidence to justify the extermination of game as a means of clearing a district of diseases transmitted by blood-sucking insects. Evidence on the subject is difficult to collect and often most untrustworthy. Microscopical examinations of blood are not usually conclusive because the pathogenic micro-organisms are frequently so scanty in the blood of a diseased animal that it is like looking for the proverbial needle in the haystack to attempt to find one in the minute field of the microscope.

20. In the controversy of "Game versus Disease" what is so urgently needed is a very extensive experiment with skin inoculations, carried out in different districts on a large scale. The susceptible animals should be inoculated NOT ONLY with the blood of game animals but also with that of all other animals in the infected districts such as Hyenas, Jackals, Pigs, Baboons, Hares, Rats, etc.

21. Only by such experiments can it be definitely proved whether or not the game acts as a reservoir of disease and whether it is the only reservoir.

22. Until these experiments have been thoroughly carried out

but no sane Government should agree to the extermination of the game. And it is for these inoculation experiments that friends of game preservation should call and insist upon.

I remain,

Yours faithfully,

R. B. Moorman

Game Warden,

British East Africa.

For East
3548

80
G.D.
L 21 FEB
21

22 Feb 1912

Dear Sir

I have the honor to
ack the receipt of your
desp. no 17 of the 17th of
Jan. transmitting an article
written by Mr. Woodman
on the subject of the
prohibition of bills introduced
in Africa or particularly
in the West Indies &
I have to request that
you will inform Mr. Woodman
that I have read the
article with ^{much} great interest
owing to the controversial
nature of the subject,
I am unable to approve
of its being published in

DRAFT

Mr. Woodman
Mr. P. Finlay

MINUTE

- Mr. A. B. 2 1/2
- Mr. Butler 20
- Mr. Read 20
- Mr. Bridges
- Mr. H. Just
- Mr. J. Anderson
- Lord Emsay
- Mr. Harcourt

Recd to SR. En
the 10th night
to the S. of 3, minute

Recd 21
Cm 2/3

the "Irelo" under his

Wassman's name, but

arrangements are being made

to have it published.

arrangement

The Royal Society,
Trinity House,
London.

1319.
The Editor of the Field on Feb 22nd

1319. I was informed

on April 25th as being available

for publication in the City

as was returned at the Bureau

W. B. Bingham

April 25th 12

COPY.

82

The Field,

Windsor House,

Bream's Buildings,

London E.C.

23. 4. 1912.

The Editor regrets that he has been unable to find room for the enclosed MS. A good deal of correspondence on the subject has already appeared in The Field, and as there will be a Report of the Royal Land Commission under the direction of Sir David Bruce it seems desirable to defer any further comment until that is published.

Heretofore readers may be referred to the Parliamentary Paper (1911) issued by the Colonial Office in July last.

The Editor ventures to think that the six questions noted on page 749 of the accompanying MS. would be better referred to the Commission rather than discussed in the columns of The Field.

The Editor is exceedingly obliged to Mr. Bagshawe for his kind remembrance.

17 of 9. 1 1912

Game Warden's Office,

Nairobi,

83

British East Africa.

No. 287/11.

6th December 1911.

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2. There is some very important correspondence contained in this paper on the subject of Tsetse fly and Big Game and I should particularly like to draw the attention of readers of "The Field" to the letters of Dr. Prentice, Honorary Secretary of the Livingstonia Committee of the United Free Church of Scotland and Dr. A.G. Bagshawe, Director of the Sleeping Sickness Bureau.

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7. The whole question of the relation of game animals and disease both animal and human in Africa is a very complicated

complicated one and also a very serious one, and I am willing to admit this and it is not my intention to attempt to oppose any measures, necessitating the extermination of game, when it is definitely proved that such measures are necessary in certain districts. But I maintain that too much attention has been concentrated upon the game while the possibility of other animals also being implicated has been almost overlooked by the general public. This applies not only to Tsetse flies and Trypanosomiasis but also to other diseases of domestic animals and man, and in view of these facts it does not seem likely that any useful results will be obtained by exterminating the game and leaving other animals.

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It must also be remembered that it is highly probable that Tsetse flies (Glossina) are not the only blood-sucking flies capable of transmitting Trypanosomes. Stomoxys has already been proved to transmit a Trypanosome in Mauritius and the Philippines and other genera such as Tabanus, Haematopota and Hippobosca are to be treated with the

greatest suspicion.

(2) With regard to the Piroplasmoses there is no doubt that the game supply some of the blood which feeds the ticks which are the transmitting agents of this class of diseases, but it must be remembered that, with the exception of *Piroplasma equi*, the pathogenic micro-organism causing biliary fever in horses and mules which has been proved to be carried in the blood of Zebras, wild game animals have not been proved to act as reservoirs for the other pathogenic Piroplasms of East Coast Fever and Red Water. On the contrary a tick infected with East Coast Fever is rendered clean by feeding upon a game animal.

(3) The ultra-microscopical virus of Rinderpest undoubtedly attacks game animals, for it has destroyed thousands, but the closely allied disease Gastro-Enteritis has not yet been definitely proved to be carried by game. There is no doubt that many of the serious outbreaks of Rinderpest in Africa among game animals have been primarily caused by the movements of infected domestic cattle.

(4) Of intestinal parasites certain ones are found in game, but it is not known that the intestinal parasites of game are zoologically similar to those of domestic animals and consequently capable of transmission the one to the other, and the extermination of the game would certainly not be followed by the disappearance of the parasites.

9. In the fight against the diseases in question there is another point which has not received the attention from the
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general public that it merits and that is the question of immunity and the possibility of producing it or hastening it artificially. The task of exterminating all animal life in the infested areas and also the insects which transmit the diseases is such a gigantic one that it appears almost impossible, and the prospects of success by producing an immunity appear to many more hopeful. This applies more particularly to the Piroplasmoses, but those interested in the subject should not fail to read "Studies in Immunity" by B.T. Terry, page 310 of Sleeping Sickness Bulletin No. 29, which gives a most interesting account of a long series of experiments with different Trypanosome infections with special reference to the immunity following cure. Some of these experiments gave most encouraging results.

10. It is interesting but not very profitable to speculate upon the past history of immunity in nature. Such parasitical forms of life as Trypanosomes and Piroplasms may have evolved zoologically, comparatively recently or may have been recently promoted to a life cycle in the blood-stream of vertebrates. There are many blood parasites known, such as Halteridia and certain Leucocytozoons, and also certain Trypanosomes which produce no disease in the animals in which they are found at the present day, but they may have caused great mortality among these animals in the past, before their hosts developed an immunity and became tolerant of them.

11. The question of immunity therefore appears to be one of great importance. If wild animals can acquire an immunity in nature and domestic native cattle can also acquire

acquire immunity is it not possible that the greatest success may eventually result from an artificially produced immunity.

12. The Commission which is just commencing work in Nyassaland under the direction of Sir David Bruce has in its power the possibility of settling once and for all the burning question of the relation of big game and Tsetse fly and the diseases transmitted by the Tsetse fly.

It is to be sincerely hoped that this Commission will therefore concentrate its attention on answering certain primarily important questions, leaving as matters of secondary importance such details as the particular species of Trypanosome with which they are dealing and the symptoms of the disease produced.

13. There are six questions which need answers and until these questions are answered it is impossible to decide upon a definite and practically useful plan of campaign.

Briefly these six questions are :-

1. Are game animals the only wild animals which are acting as "Reservoirs" for Trypanosomes?
2. Are the Trypanosomes found in the blood of game animals pathogenic for man and domestic animals, and if so, are not the Trypanosomes found in the blood of other animals also pathogenic?
3. Are Tsetse flies the only transmitting agents of these Trypanosomes in the infected areas?
4. Are game animals the only source from which the Tsetse flies or other transmitting agents draw their blood supply. And if not what are the other sources of supply?

5. Can Tsetse flies live and breed upon food other than blood, such as plant juices?
 6. Is the increase and spread of Tsetse flies dependent upon game alone, and if not what are the governing factors?
14. The first two of these questions can only be answered definitely by carrying out an extensive series of skin inoculation experiments and it is essential that the susceptible animals should be inoculated not only with the blood of game animals but also with the blood of all other animals and reptiles in the infected areas.
15. The third question suggests its own necessary experiments.
16. The fourth question is more difficult but will be answered to a great extent by the skin inoculation experiments and by the discovery of Trypanosomes in the blood of other animals.
17. For the fifth question I should like to suggest some such experiment as the following:-

That a freshly killed bird or small mammal should be quickly skinned and the skin filled with honey or crushed banana (or some other fruit which could represent "plant juices") which must of course be brought up to blood temperature. The skin might then be pressed against the gauze of a Tsetse fly cage, to determine whether blood sucking flies can subsist upon such food as honey, or plant juices. Personally I am sceptical of the likelihood of such specialized insects as blood-sucking flies being

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19. In conclusion I may say that at present there is not sufficient scientific evidence to justify the extermination of game as a means of clearing a district of diseases transmitted by blood-sucking insects. Evidence on the subject is difficult to collect and often most untrustworthy. Microscopical examinations of blood are not usually conclusive because the pathogenic micro-organisms are frequently so scanty in the blood of a diseased animal that it is like looking for the proverbial needle in the haystack to attempt to find one in the minute field of the microscope.

20. In the controversy of "Game versus Disease" what is so urgently needed is a very extensive experiment with sub-inoculations, carried out in different districts on a large scale. The susceptible animals should be inoculated NOT ONLY with the blood of game animals but also with that of all other animals in the infected districts such as Hyenas, Jackals, Pigs, Baboons, Hares, Rats, etc.

21. Only by such experiments can it be definitely proved whether or not the game acts as a reservoir of disease and whether it is the only reservoir.

22. Until these experiments have been thoroughly carried

(10)

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I remain,

Yours faithfully,

P. B. ...

Game Warden,

British East Africa.