FEVERS IN SIERRA LEONE (MOUNT AUREOL), BEING A PRELIMINARY ACCOUNT OF AN ENQUIRY INTO THE CAUSES OF THE CONTINUED PREVALENCE OF ILL-HEALTH IN AN APPARENTLY FAVOURABLY SITUATED HILL STATION.

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Mount Aureol is some 800 feet above sea-level. It is occupied solely by troops (European Artillery and negroes of the West India Regiment). It is cut off by height and about half a mile of uncultivated ground from the nearest portion of the native town (Freetown) lying on the 100 feet level below.

Here then is a place most favourably situated for freedom from malaria and for the practice of malarial prophylaxis. The air is exhilarating, the water supply good, there are no pools of water in the barrack grounds, the population is under disciplinary control, no natives live in the station, the military occupants are almost entirely adult men (one woman and one child live in the barracks). Nevertheless Mount Aureol is not healthy.

The admission rate for fevers at Mount Aureol during the present year has averaged roughly 1,955 per 1,000 per annum for Europeans, and 1,329 per 1,000 for West Indians.

It seemed that a profitable field of enquiry lay before us at Mount Aureol, for this sanatorium is more or less a reproach to us. With a wave of the hand, so to speak, crowded West African towns have been (we are told) rendered salubrious. Meantime health in these barracks is unchanged. On all sides we hear men in high positions scoffing at what they call the "mosquito theory"; for is it not a fact, they say, that there are no mosquitoes at Mount Aureol. Feeling then that the good repute of preventive medicine was in jeopardy, we decided to endeavour to restore confidence in the practical utility of scientific methods by devoting our energies to the elucidation of this fever problem.

Our line of investigation is this:—

Question 1.—What is the real nature of Mount Aureol fevers?
(This part of our enquiry is doubly necessary in view of a suspicion that coast fevers are carelessly diagnosed by physicians, that every rise of temperature is ascribed to remittent fever, and that records of malaria prevalence are therefore unreliable.)

**Question 2.**—Where and from whom are the fevers contracted? (That is to say, do men pick up their illnesses when visiting the town, or are they infected in barracks?)

**Question 3.**—What measures can we advocate for the betterment of health in barracks?

With regard to **Question 1**, a systematic examination of blood in a good number of cases was necessary. It was arranged that admissions to hospital should be diagnosed clinically before the diagnosis by microscopes was divulged (the only difference, if any, from the usual practice would be in the direction of increased care born of the knowledge that the diagnoses were to be checked by microscopic methods).

All the slides were examined by the aid of Leishman's excellent stain.

Forty cases were dealt with under the above conditions. Of these twenty-nine showed malarial parasites on the first and one on the sixth examination.

The organisms were classified as below:—

- **Tertian** 1 case.
- **Quartan** 1 case.
- **Malignant** 28 cases.

One of those in which the parasite was not found was "blackwater," which is always returned as malarial; the negatives therefore may be taken as nine in number. Six of these were only examined once, in some cases after quinine and during defervescence; in view of the fact that in one case above noted parasites were not found until the sixth inspection, we think it likely that a portion of these six were really malarial. One man developed a rash and his disease was changed accordingly on clinical grounds. Two men showed no parasites in three examinations (one of them recovered under quinine, and he returned to duty; the other is a chronic case still under notice, and likely to prove tubercular).

Allowing due weight to the negative results, we must still admit that the **bulk of fevers at Mount Aureol are in fact malarial.**
There is not much ground for the opinion that diagnoses are more incorrect here than elsewhere. The medical officer is bound to select out of the College of Physicians' nomenclature a name for every disease in hospital, and when in doubt he naturally falls back upon the common disease of the country just as in England the puzzled practitioner uses the term influenza. This seems to be the least harmful course from the etiological point of view in records. Anyway it is clear that if we can do away with the malaria, Mount Aureol will be a healthy station.

As to Question 2, where do the fevers come from? We have a much more difficult point to settle. The hospital is situated on a well-aired spur some 200 feet distant from, and 200 feet below, the barracks, and the patients are quinined—infection from the hospital must be unusual. The points bearing on the matter seem to be:

1. Are there any infectious cases in barracks?
2. Are there in barracks the insect agents necessary to the spread of the disease?

The question of initial cases presents no difficulty, for the troops came from the West Indies originally. Moreover, it is beyond dispute that some cases are contracted in the town, for the men at Tower Hill suffer very much from malarial fever, and Tower Hill barracks lie in the middle of the town. (Indeed, the continued prevalence of fever at Tower Hill is somewhat of a disparaging commentary on the results claimed to have been effected by mosquito brigades in Freetown, and as far as common report can be credited the same may be said of the natives' statements that this has been a bad fever year for Freetown.)

Infected Men at Their Duty in Barracks.

At the ordinary weekly inspection by the medical officer a few sickly looking men from two companies were selected for blood examination. Out of twenty-two West Indian men so picked out eight were found on the first examination to be harbouring parasites. We may assume that these eight represent a larger number of infected men sleeping in the barrack rooms.

The solitary child was also found to have parasites. (She had been living in Freetown until a few weeks ago.)
The European company of Artillery had unfortunately gone home just before our work was begun; but we have enough evidence that there is abundant infective material in the barracks provided the essential insect hosts are at hand.

The objection now comes in. Mosquitoes are singularly scarce! Some officers and all the men sleep without nets. They say that there are no mosquitoes. That their statements are only relatively true we have proved by capturing a few culex in quarters of officers and men (not one of them, however, appeared to have fed on other than vegetable matter). Prolonged searching has brought no anopheles to light in barracks. As set forth in Appendix VIII., A. M. D. Report for 1900, however, by one of us (F. S.), there is a mountain brook in the jungle not far from the barracks, and the holes in the rocky bed of this stream contain many larvæ during the dry season (the season which is now upon us). At a later period in the dry season than that with which we are now dealing a few adult insects were in those days found in Mount Aureol barracks. (That was in the early part of the year when the stream-bed contained least water and most anopheles larvæ, and when as a matter of fact the fever rate was high.) Still, we are accustomed to find that where fever is very prevalent the anopheles are not difficult to discover, and the fact of our inability to demonstrate their presence in barracks suggests that the fever may be contracted outside. It may be that we might have found them before the period dealt with, or that we shall find them later on; for after all a large airy barrack-room affords many hiding places for such small objects.

The position then in recapitulation is this:—

(a) There is a large amount of malarial fever at Mount Aureol.

(b) Some of it, certainly, is contracted in Freetown.

(c) Part of it may be contracted in Mount Aureol.

(d) Anopheles are bred in a stream not far away and might be expected to come to barracks as being the nearest inhabited place.

(e) During the period from the latter part of November to the end of December, we have been unable to find anopheles in barracks, though we have found them on the banks of the stream.
It remains to us to make further enquiry into the anopheles question at Mount Aureol, for until we find an infected mosquito in barracks we cannot say for certain that any of the illness is contracted there. It is our purpose to construct traps and also to fumigate barrack rooms in the hope of recovering the killed insects. We defer the consideration of prophylaxes until we are on safer ground as to this mosquito question, merely premising that we consider it impracticable to do away entirely with the breeding of anopheles in the brook, having regard to the fact that the stream forms our drinking water supply, and to the enormous expense which would be entailed by converting the two miles or so of brook into an aqueduct.

Major L. S. Blackden, 2nd West India Regiment, Commanding the Detachment at Mount Aureol, has entered into the spirit of our quest and kindly facilitates matters. He has, moreover, used his mosquito net as a trap, and himself as a bait, but with no luck, or rather ill-luck.

In conclusion we wish to say that No. 17872 Pte. C. R. Thorp, R.A.M.C., has rendered us valuable assistance in our work.