

so, but medicine, as opposed to surgery, has never had its due share of attention in our hospitals and dispensaries. My object in writing this article is to urge upon Civil Surgeons in small stations where the work is not heavy, to carry out similar observations to those I have done, and to record them. Malaria is no doubt a very prevalent disease during many months of the year, but that it is as omnipresent as the statistics show is not to be believed. During the winter months many districts are probably free from malaria altogether, and my experience of the Gonda, Terai, would tend to show that even in these malarious districts, malaria may not be very prevalent during the cold weather in ordinary years. A scheme, I believe, is at present under the consideration of the Government of India for the better registration of births and deaths. I am sure Civil Surgeons will look with a very friendly eye on all such attempts to improve the vital statistics of India; but it will be a long time before any statistics in India other than those emanating from medical officers of regiments, corps and institutions can be considered to be as reliable as those of the Registrar-General.

A Mirror of Hospital Practice.

ON SOME NEW ANOPHELINES OF CALCUTTA AND ON THE SEASONAL PREVALENCE AND VARIATIONS OF ANOPHELINE FULIGINOSUS OF CALCUTTA.

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In their reports to the Malaria Committee (1902), Stephens and Christophers describe the prevalence of the following species of Anophelines in Bengal.

A. rossi, *A. fuliginosus*, *A. sinensis*, sub-sp. *nigerimmus*, *A. lindesayi*, *A. metababs* and *A. christopheri*. Of these, they found *rossi*, *fuliginosus* and *nigerimmus* in Calcutta and certain of its outlying portions. Subsequently, Alcock collected some *listoni* in Calcutta and Adie in a private communication tells me that he found some *listoni* in the tank of the Indian Museum.

In their Monograph on the Anophelines of India (Second Edition), Liston and James mention the presence of the following additional species in Calcutta: *Myzorrhynchus jamesi* and *Myzorrhynchus barbirostris*.

My work on the Anophelines of Calcutta extends over a year. During this period I have discovered the following more additional species in Calcutta.

The first of these is *Myzomyia ludlowii*. It is allied to *M. rossi* but has speckled legs. Recent

investigations of Christophers have proved this to be the carrier of malaria in the Adamans.

The second new species in *M. culicifacies*. It is allied to *M. listoni*, but differs from it in some important points, such as fine dark areas on the costa, black-scaled third longitudinal vein, presence of only three white patches on the costa including the one at the apex, etc. It is a very efficient malaria-carrier in nature.

The third new anopheline is the one, a specimen of which was exhibited by me in the April meeting of this Society last year and subsequently described in the July number of the *Indian Medical Gazette*. This belongs to a new species which has been designated as *M. brahmacharii* by Christophers. Its great peculiarity is that its proboscis is white-scaled in its outer half. In their Monograph, Liston and James point out that, so far as they are aware, *Nyssomyzomyia punctulata* is the only anopheline which is white-scaled in its outer half. This new *myzomyia* is, therefore, the second species of anopheline in India which has also got the same characteristic.

All the above *myzomyias* were found in the tank of the Campbell Hospital, *ludlowii* being found in from November to February *culicifacies* in February and *brahmacharii* in February and March.

I have also found *listoni* in the same tank in which there is no running water, just as Alcock and Adie found them in the tank of the Indian Museum. *Listoni* were found from October to March.

The largest number of *stephensi* were found in a masonry reservoir containing water for washing cooking utensils.

Contrary to the observations of Stephens and Christophers, I found *A. fuliginosus* to be the most common anopheline in Calcutta.

Out of nearly 12,000 larvæ caught from July to January, about a ninth developed into the adult stage, the remaining having died. This probably gives us an idea of the enormous number of larvæ that do not pass to the adult stage. It would be most interesting to observe the influence of seasonal variations on the natural destruction of anophelines in the larval stage.

Seasonal variations of a *fuliginosus* of Calcutta.

The characteristics of a *fuliginosus* of Calcutta:

(1) The costa has to six long black-scaled areas separated by white spots.

(2) There is a frequent tendency to the occurrence of long white bands in the femur and tibia and sometimes in the first tarsal segment in the ventral and lateral aspects of the legs. These bands are parallel to the long axis of the legs.

(3) Frequently, there are no white bands or scabs at the junction of the 4th and 5th tarsal segments in the forelegs. Similarly in the mid-legs there are generally no white bands or scabs at the junction of the 3rd and 4th tarsal segments as well as of the 4th and 5th tarsal segments.

(4) The third longitudinal vein is generally white-scaled in the middle of its course, but sometimes, without any other seasonal variation, it may be black-scaled especially in winter.

(5) The tip of the fifth tarsal segment in the hind leg sometimes contains a minute black spot.

(6) The peculiar seasonal markings of the tarsal segments of the hind legs, which I shall describe presently.

The typical fuliginosus of Calcutta has three tarsal segments perfectly white in the hind legs. As winter approaches, faint dark spots appears in the proximal ends of the third tarsal segment. These spots increase till half and sometimes almost the whole of the segment becomes black-scaled.

The tip of the fifth tarsal segment is more frequently found to have a minute black spot during winter. In some cases, almost the whole of the fifth tarsal segment in the hind leg is found black during winter.

In this season, the third longitudinal vein is more black-scaled in the middle of its course than white.

Contrary to what is found in *Adei*, the palpi of fuliginosus of Calcutta are always the same as in the type, the palpal bands being always three. The seasonal variations are not so constant as in *Adei*. While it is more frequent that in winter the third longitudinal vein is more frequently black and the third tarsal segment in the hind leg also tends to be black, we find that this is not invariably the case, nor is the amount of darkness constant and sometimes this may be completely absent.

Lastly the junction of the third and fourth tarsal segments in the mid leg is frequently found to be black throughout the year.

The *A. fuliginosus* of Calcutta differs from *Adei* in the following points:—

(1) The palpal bands are always three and never four.

(2) The junction of the third and fourth tarsal segments in the mid leg is more frequently black-scaled and only occasionally white-scaled.

(3) The tip of the fifth tarsal segment in the hind leg has sometimes a minute black spot, especially in winter and sometimes the whole of the segment tends to be black.

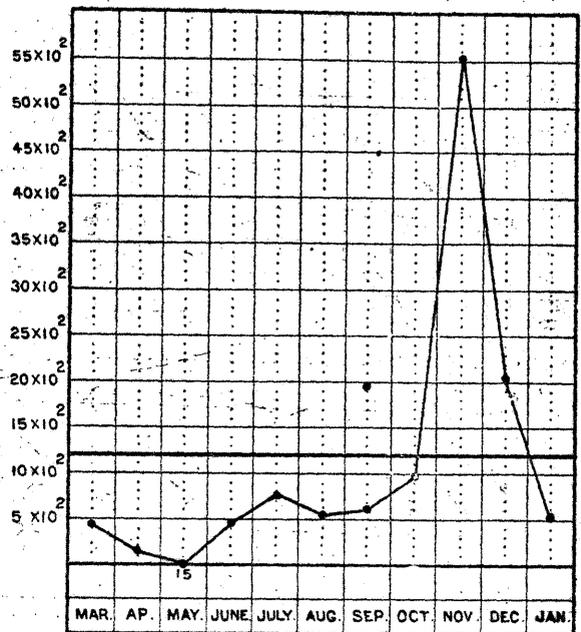
(4) The seasonal variations are not so constant as in *Adei*.

The seasonal prevalence of anopheline fuliginosus of Calcutta.

The method by which I have estimated the anophelines in a locality depends upon careful daily larval counting from the breeding places. I already described this method in the meeting of this section of the Asiatic Society last April, and subsequently in the meeting of the Central Malaria Committee held in Bombay last November.

Assuming that the number of adults are proportional to the number of larvæ caught, I have drawn the accompanying curve from the monthly larval counting of *A. fuliginosus*.

It will be seen from this curve that the number of a fuliginosus is lowest about May and highest



towards November. There is also a rise in their number in July.

It must, however, be mentioned that the sides of the tank, from which the larvæ were collected, were cleared out in May and December, and the diminution in the number of larvæ caught may have been partly due to the clearing out of the weeds. That this is not the only cause of their diminution is borne out by the fact that the number began to diminish before the cleaning of the sides of the tank was started.

The highest rise in the anopheline curve in Calcutta seems to correspond to the greatest prevalence of malaria in Bengal, *i.e.*, in November.

The numerical determination of anophelines in any locality is a very important matter for malarialogists to study, as by this we can forecast the occurrence of intense or epidemic malaria. As there are no accurate methods for their determination, it would be very interesting if observers would test the accuracy of the method described by me—a fact that can only be settled by careful and laborious observations for several successive years and this is what I myself also propose to do.

LAMBLLIA INTESTINALIS AND ITS POSSIBLE CONNECTION WITH POONA DIARRHŒA.

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In the autumn of 1910 I had occasion to take an old Indian patient, who had been under my