

conduct in relation to impulsive acts or dream states, could render incalculable service both to the individual affected and to the community. Greater interest in psychiatric problems will establish co-operation between medical men in general and those in charge of mental hospitals and tend to better attention being paid, not only to those who have

(2) The extent of the "carrier" factor. A brief reference will now be made to those diseases which it has long been customary to isolate. In Table I remarks are made in connection with the two questions raised, and the value of isolation is indicated.

TABLE I.

Disease.	Question 1.	Question 2.	Value of Isolation.
Cerebro-spinal fever.	Yes.	Carriers very difficult to eliminate.	Small.
Cholera.	No.	Carriers infected for 2 3 weeks.	Large.
Diphtheria.	Yes.	Healthy carriers common.	Small.
Dysentery, amœbic.	Yes.	Ambulant cases common.	Small.
Do. bacillary.	No.	Direct contagion common.	Large.
Influenza.	No.	Direct contagion usual.	Large.
Leprosy.	Yes.	Ulcerating types infectious.	Large.
Measles.	Yes.	Contagion greatest in pre-eruptive stage.	Small.
Plague.	Yes.	Very contagious.	Large.
Scarlet fever.	No.	Very contagious.	Large.
Smallpox.	Yes.	Very contagious.	Large.
Tuberculosis.	Yes.	Ambulant cases usual.	Small.
Typhoid.	Yes.	Carriers very difficult to eliminate.	Small.
Typhus.	No.	Very contagious.	Large.
Venereal Disease.	Yes.	Infection difficult to eradicate.	Small.
Yellow fever.	No.	Carriers unknown.	Large.
Malaria.	No.	Complete cure usual.	Large.

once been victims of mental disease, but also to those who are in the border-land and who need all the help they can get to prevent a complete breakdown.

THE TREATMENT OF MALARIA: A PLEA FOR ISOLATION.

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A FEW years ago I had the good fortune to see the initiation of the treatment of general paralysis of the insane by malarial infection, in a large London asylum. Although every factor was inimical to the spread of the disease to non-infected patients, the most elaborate precautions were taken to isolate those under treatment. Such, however, is not the case in this country. Isolation wards form a feature of almost all Indian hospitals. They are used for dysentery and cholera cases, and perhaps for verminous or other undesirable subjects. However, with care in the disposal of excreta, and reasonable cleanliness, a patient suffering from any of these conditions could be safely nursed in a general ward, without any undue risk of infecting other patients.

The value of isolation depends on two questions:—

(1) Whether the disease is communicable before it can be recognised and isolated.

Now the value of isolation is greater in malaria than in the case of any of the other diseases mentioned, as will appear on considering some factors in its etiology.

(1) The source of infection is a patient with gametocytes in his blood.

(2) Gametocytes do not develop until a week after the fever commences.

(3) Diagnosis is easy and positive.

(4) Infection can only be transmitted by the anopheline mosquito.

(5) By isolating the patient it is impossible for the mosquito to reach him.

(6) In a relatively short time, a patient can usually be completely cured of malaria, without the possibility of return, apart from reinfection.

(7) The cure can be confirmed by the microscope.

This must be contrasted with the usual happenings in ninety-nine out of every hundred hospitals in India. The patients all have lowered resistance, they are congregated rather closely, and a constant stream of infection is hourly passing from those infected with malaria parasites to those not infected. Worse than this, mixed infections are occurring, a benign on a malignant, and both together on a convalescent pneumonia case perhaps. Worse again, a constant stream of infection, more intense and certain than any other mode of infection, is hourly passing

through windows and doors to the residential district around the hospital.

It may be objected that malarial infection is so broadcast that isolation measures in hospital can play only a small part in prevention. As far as the outside population of a large town is concerned this may be admitted, but still the other hospital patients would be safeguarded just when they are most susceptible to infection. In the case of industrial colonies, however, such as tea gardens and mines this objection does not arise. Here the two sources of infection are the acute cases in the wards, and chronic cases, mostly children, in the lines. It has frequently been stressed that these children should be systematically treated in order to sterilize their blood from parasites, but the importance of isolating the acute cases in the wards has not been emphasised enough, at any rate in India. Patients with malarial fever usually come to hospital quite readily, and there would be no difficulty in isolating them.

Practically all hospitals in tropical America employ screening as a matter of course. Watson(1) in his book on the prevention of malaria in the Malay States, devotes a chapter to screening, and gives interesting figures of its efficacy in hospitals. These are reproduced in Table II.

but this again is not satisfactory, as the mosquitoes gain access to the wards with the constant opening and shutting of doors, and, once imprisoned in the hospital do more harm than if they had free ingress and egress.

The only satisfactory method is to entirely screen a given block, leaving only one entrance. The screening is best fitted to the outside of the verandahs, leaving doors and windows free. The single entrance must be efficiently trapped. This is best effected by double doors with an antechamber between. The doors must be provided with springs so as to be self-closing, and suitable punishment must be meted out to the "save-time" gentleman who props them open. Having entered the first door, a short passage is crossed before reaching the second door. It is very unlikely that any mosquitoes will then be able to penetrate the ward. The doors in each case should open outwards, so that mosquitoes resting on them should not pass into the room.

Objection is often made that such mosquito-proof rooms are unbearably hot. This does not arise if electric punkahs are available, but even without them ventilation can very easily be increased so as to overcome the stuffiness. Archemidian ventilators help in this way, and many other similar devices.

TABLE II.

Showing the number of Beriberi patients attacked by Malaria at Jeram.

Condition of hospital.	Mosquito nets only.	Ward mosquito-proof by screening.	Nets only.	Malaria cases not admitted.
Number of months	26	11	15	12
Number of patients attacked ..	75	5	48	20
Average number attacked per mensem	2.87	0.45	3.20	1.66

The great diminution with screening, and the rapid rise after removal of the screening show what a valuable part it plays. Yet I do not know of a single tea garden hospital in Assam which has adopted this course. Strickland(2) advises mosquito-proof bungalows and clubs, but does not include mosquito-proof hospitals, in his recent valuable paper on "The Mosquito Factor in the Malaria of Assam Tea Gardens."

Methods of screening.—At one hospital under my care individual mosquito nets were tried. These proved an entire failure as far as Indian patients are concerned.

They nearly always contained one or two mosquitoes when they were raised the next morning, and these mosquitoes were all the more intensely infected.

Efforts have been made to fix wire screening to the windows and doors of each ward,

Another objection is the "cribbed, cabined, and confined" feeling experienced in such rooms. This was more obvious in the older types of screening, but it is now possible to get finer wire which scarcely obstructs the view at all.

Cost.—Three types of wire screening are available: painted, galvanised, and almost pure copper. Undoubtedly the latter is cheapest in the long run as it is almost everlasting. To give an idea of the cost, a recent quotation for screening 48 inches wide, per 1,000 ft. was as follows:—

Painted.	Galvanised.	Copper.
Rs. 300.	Rs. 400.	Rs. 1,000.

A fairly large hospital can be completely equipped with this amount of screening. In a malarious district the whole hospital should be screened and not only the malaria wards.

Finally, it must be admitted that the extermination of anopheline mosquitoes in tea garden districts offers an almost insuperable difficulty. It can only be done after many years of constant work on a progressive programme. It involves large sums of money, and altogether it is an unattractive business to directors and shareholders. On the other hand, elimination of gametocyte carriers is relatively easy and less expensive. In the case of children, this should be done by ascertaining spleen and parasite rates, and subsequent treatment. In the case of infection derived from acute malaria patients, it is contended that the importance of isolation has not received the attention which is its due, and that screening is the ideal way of prevention.

SUMMARY.

- (1) The value of isolation generally.
- (2) The value of isolation in malaria.
- (3) Practical considerations.
- (4) Methods of screening.
- (5) Cost.
- (6) Conclusion.

REFERENCES.

- (1) Watson. *The Prevention of Malaria in the Federated Malay States*, Murray, 1921.
- (2) Strickland. *Indian Med. Gaz.*, Vol. LX, No. 11, 1925.

EFFECTS OF BEE VENOM.

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It is very rarely that cases of multiple bee stings are met with, though medical text books occasionally allude to deaths in human beings from this cause, without giving details of symptoms, and the main object of this paper is to report two such cases which survived, as also the results of single stings in certain patients who have come under my care, and some simple experiments with the venom of these stinging Hymenoptera on rabbits.

The action of snake venom has been the subject of a considerable amount of research from time to time, but little attention has been given to the study in India of insect poisons as affecting man. The local effect of the venom of bees and wasps is well-known and the constitutional effects apparently vary, at any rate in human beings. Judging from the literature available, the action of the toxins of bee venom is considered to be neurotoxic, i.e., causing paralysis, and the red cells are said to be destroyed by it by a process of hæmolysis and there may also be a

decalcification of the blood. The paralysing effect has been observed chiefly in other insects and the smaller animals but not in man. The virus is probably not sufficient in amount for this action to occur in man and in those rare instances where a sufficient amount may have been injected, as when a swarm of infuriated bees have attacked an individual, the death has been reported as from shock, insufficient time having elapsed for the observation of symptoms of paralysis. Judging from the two cases of multiple stings which have recently come within my experience motor paralysis at any rate was not seen, and the numbness felt in the swellings of the second case were the only symptoms of a sensory paralysis.

It seems to me from experiments on rabbits that the power of the virus is diminished when wild bees are placed in captivity in glass jars before being made use of experimentally. In the early part of their captivity they become very infuriated and restless and use their stinging apparatus indiscriminately against anything soft which they meet, such as a part of the comb itself or against each other. (They were usually careful not to strike at anything hard.) Once the initial restlessness wears off they quieten down, but directly they are interfered with again the same restiveness is repeated with probably a further weakening of the venom. Hence when honey bees are taken for experiment they should be made use of without delay. The three common Indian varieties, namely *Apis dorsata*, Fabr., *Apis indica*, Fabr., and *Apis florea*, Fabr., all die in jars on or about the third day after being taken, owing among other things chiefly to lack of fluid. The last two species are not half as fierce and energetic as the first. As their time in captivity goes on they naturally weaken and become sluggish, and the sting is hardly used even when they are picked up with a pair of forceps and irritated.

When stung on any loose tissue I personally suffer from a smart local reaction with moderate puffy swelling, and one day through carelessness a few of my third day stocks of *Apis dorsata* flew out and one alighted on my hand and another on my cheek, and each delivered a well earned sting. I felt rather alarmed at first, but to my surprise the reaction was of the very mildest type I have yet had, and was in all probability due to the effect on the bees of the duration of their captivity, this having had its deteriorating and weakening result on the venom.

Apis dorsata and *indica* only were used in my experiments. The insects were killed with a few drops of chloroform and the sting and poison glands dissected out and washed in weak phenol solution, and an emulsion made of them in distilled water which was