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# REPORTS

on

## **The Vision of School-Children,** **Lighting, Desks, &c.**

By

Major T. W. GIBBARD, R.A.M.C.

Major T. McDERMOTT, R.A.M.C.

□ Major F. KIDDLE, R.A.M.C. □



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1908



Rawalpindi, 4th April 1907.

FROM

MAJOR T. W. GIBBARD, R.A.M.C.,  
SPECIALIST IN OPHTHALMOLOGY,

TO

THE OFFICER COMMANDING  
STATION HOSPITAL, RAWALPINDI.

SIR,

Copy attached.

In accordance with instructions received in letter\* No. 39, dated 3rd January 1907, from the Principal Medical Officer, His Majesty's Forces in India, to the Lieutenant-General, Commanding Northern Command, I have the honour to forward Report on the vision of school children, lighting, type of desks and seats, etc., of each school attended by the children of British soldiers at Peshawar, Nowshera, Sialkot, Ambala and Rawalpindi.

A specimen of the "Adjustable" desk recommended by me for adults and elder children is being made by the Military Works Department here and will be reported on later.

I have the honour to be,

SIR,

Your obedient Servant,

T. W. GIBBARD, Major R.A.M.C.,  
Specialist in Ophthalmology.

Principal Medical Officer, 2nd (Rawalpindi) Division.

Forwarded.

W. O. SULLIVAN, LIEUT.-COLONEL, R. A. M. C.,  
Officer Commanding, Station Hospital, Rawalpindi.

April 15th, 1907.

No. 46 E Head Quarters, Northern Command, Medical Division, dated 8th January 1907.

Copy of letter No. 39, dated 3rd January 1907, from the Principal Medical Officer, His Majesty's Forces in India, to the Lieutenant-General, Commanding Northern Command.

With reference to para. 32 of Report of Committee, forwarded under this Division No. 5770, of 12th ultimo, I am directed by the Commander-in-Chief to request you will be good enough to issue the necessary instructions for Major T. W. Gibbard, R.A.M.C., a Specialist in Ophthalmology, to visit the stations marginally\* named at an early date and examine the children of British soldiers at these stations as to the condition of their eyesight—sub-para (f). In those instances where glasses are required the necessary representations and information should be afforded the parents concerned.

2. It is suggested that the above inspections should take place in the school rooms, as the teachers may be able to afford useful information when dealing with each individual child.

3. Major Gibbard should also report on the lighting—sub-para. (a) of each school, and if faulty state whether the same could be remedied by structural alterations. The type of desks and seats—sub-para. (c) with special reference to their adaptability for proper vision, might also be noted on.

4. On the conclusion of the inspections, a Report should be submitted to this office with any remarks you may wish to add. The result of the examination at Rawalpindi which, it is understood was carried out last year, might also be embodied.

5. A copy of the Report of the Committee referred to in para. 1 is endorsed for Major Gibbard's personal use.

Memorandum.

Forwarded for information and for favour of necessary action in direct communication with the G. O.'s Commanding 1st (Peshawar) and 3rd (Lahore) Divisions.

The report referred to in para. 4 of the P. M. O. in India's letter should be submitted to me in due course.

(Signed) A. SCOTT REID,

Surgeon-General, I.M.S.,

P. M. O., Northern Command.

To  
The General Officer Commanding  
and (Rawalpindi) Division.

\*Peshawar, Nowshera, Sialkot, Ambala.



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## NOWSHERA.

There is at present only one school here for the children of British soldiers. It is now used by the 1st Battalion Seaforth Highlanders, but when this regiment moves to the new hatted camp, it will be used by the Batteries of Royal Artillery shortly to be moved here. The building appears to have been originally constructed for married quarters, and to have been converted later into a hospital for native troops. Whether this is so or not I cannot say, but as it stands at present it is not suited for school purposes.

It is a long narrow building, running east and west, divided into two portions by a partition wall, the larger portion (two-thirds) being used for the "Adults and elder children's school", the remaining portion (one-third) for the "Infants" school.

Each portion consists of a central room, with an inner and outer verandah on either side. The central rooms only are used for school purposes. The inner verandahs are divided by partition walls into a number of small rooms, too small to allow of the present sized desks being used in them.

The desks are placed in parallel rows facing south; the teachers, therefore, stand facing the north wall. The lighting of both schools can only be considered fairly satisfactory. On dull days it is very bad, in fact occasionally lamps have to be used up to 10 a.m.; this has been necessary on four occasions during the present cold weather.

In the "elder children's school" there are four skylights, two facing north and two south; in the "Infants" two, one north and one south. The lighting of the elder children's school is supplemented by a window in the west end. The result is that the sun's rays entering the dormer windows on the south side of the roof fall on the north wall during part of the morning, and this wall, being white-washed, reflects the light into the teacher's eyes. Later in the morning, the sun falls on the desks placed on the north side of the rooms, and these desks have either to be vacated, or the men or children using them have to wear helmets. The dormer windows on the south side should be removed or covered. The walls should be colour-washed pale-green.

The desks in the elder children's school are not intended for children; as in other schools of the kind they are those supplied for men, the front of the desk being 33 inches from the floor, and the back 36 inches. The seats (forms) have no back-rests, and vary in height from 21 to 24 inches; some are too high for men, and some too low; all are much too high for children, who when using them sit with their feet either hanging in the air, or resting in an awkward position on foot-rails.

The desks and seats in the Infants' school are suitable. The former appear to be men's desks cut down and otherwise altered. The seats have back-rests.

From the above it will be seen that the lighting of both school rooms is not as good as it should be, and the desks used by the children are not suitable. The question of "desks" will be dealt with separately at the end of this report.

As regards the lighting, it may be remarked that the existing system of skylights is not a very satisfactory one, especially during the hot weather, owing to the glare and to the direct rays of the sun falling on the scholar's heads on one side of the room at certain times of the day.

In view of the building being an old one, and very large alterations being required to render it satisfactory as a school, it would in my opinion be better, and probably not much more expensive, to construct an entirely new school of a better pattern.

In the event however of funds not admitting of a new school being built, I would suggest that the following structural alterations be carried out with a view to making the lighting satisfactory:—

- (1) The inner verandah rooms on the north side should be converted into larger rooms by removing partition walls; the rooms thus formed to be reserved for elder children.

- (2) Each of these reconstructed verandah rooms on the north side to have one door (upper two-thirds glass) and two windows.
- (3) The roof of these verandah rooms to be made flat, instead of sloping in continuation of the main roof as at present. This would enable six clerestory windows to be put on the north side of the adults' and elder children's school room; these windows should be made as large as possible and have no shades.
- (4) Assuming that the present sky-lights in the main roof are retained when the roof is renewed (which I imagine is necessary now), the south windows of the sky-lights should be blocked; this would reduce glare and would enable men to attend the school in the hot weather without wearing helmets!

I repeat that in my opinion, and that of the Garrison Engineer (Lieutenant Sopwith, R.E.) who accompanied me, it would be best to build a new school. If, however, it is decided to carry out the alternative suggestions noted above, the large main room could be used for Adults only, and the verandah rooms (lighted by glazed doors and large windows) leading to that room be kept for elder children.

The desks in both schools should then be placed across the room facing east to get a side light from the left; the scholars would then face a wall with no windows or doors in it—at present they sit facing glazed doors. If the proposed verandah rooms are reserved for elder children, desks shorter than those now in use would be required on account of the narrowness of the rooms. As this building under the Nowsheera re-organization scheme, is to be retained as a school, and the alterations necessary will have to be considered in the re-organization estimates, I would suggest that the above points be taken into consideration in framing such estimates, which I understand are now in process of preparation.

#### SIALKOT.

1. *The British Cavalry adults and elder children's school* is held in a Barrack room, with inner and outer verandahs.

The lighting is better than I have seen in many school, but still it cannot be considered good. On bright days it is sufficient, but on dull days bad and requires improving.

At present the lighting is by three fairly large clerestory windows on each side (north-west and south-east) of the room. A certain amount of light is also admitted by three arches on each side, opening into the inner verandahs, with unglazed doors (which are usually kept open) in the outer verandah walls opposite the arches.

The fact that the lighting is better than in many school rooms of the kind is due to the comparatively large size of the clerestory windows, and to the sunshades having been removed from those in the north-west wall. The lighting could be still further improved during the winter months by removing the sun-shades from the windows in the south-east wall; during the hot weather the shades would be required and could be replaced.

To improve the lighting I would recommend that the shades over the south-east windows be made moveable, and that glass be put in the upper half of the doors on both sides.

This is roughly estimated to cost Rs. 75 (see estimate attached) and would probably be sufficient, but if found insufficient I would suggest that the clerestory windows on the north side be deepened. This latter would increase the cost by Rs. 150.

The main light would then be from the north-west, and the desks should be placed across the room to get the light from the left. At present they are placed in the length of the room facing the light.

This school is open during the hot weather, and is used all the year round by both children and adults. The room measures 48 feet  $\times$  24 feet: the ratio of glass to floor space is about 1 to 25.

The desks are those usually supplied for adults, with forms as seats. They are quite unsuitable for children. The forms are 22 inches high, the front edge of the desk 32 inches and the back edge 36 inches. Children of the age attending sit with their feet resting on the foot-rails of the desks, their elbows spread out, and the head bent over the desk, the child's face when writing being about 6 inches from the desk. The seats (forms) are too high and have no back rests. Adjustable desks are required, or adjustable seats with folding foot-rests.

There are at present 28 children attending, belonging to both the British Cavalry and Infantry Regiments; the schools of these Regiments being within 150 yards of each other, it has been found convenient and economical for the children of both to attend one school.

2. *The British Cavalry Infants' school* is held in a room at the end of the same building as the adults' school. Twelve children, varying in age from 5 to 7 years of age are now attending.

On bright days the lighting is fairly good, but on dull days, and when the doors have to be shut, it is bad.

To improve the lighting I suggest that

1. The clerestory windows on the north side be deepened.
2. Glass be put in the upper half of the doors at either end.
3. The sunshades over the clerestory window on the south side be made moveable. (There is no sunshade over the north window.)

These alterations are estimated to cost Rs. 78 (estimate attached). Should it not be possible to arrange for the sunshades to be raised or lowered from the room itself, there would be no difficulty in doing this from outside since all the bungalows have steps leading to the roof.

Desks. There are three different heights of forms provided for children; some have back-rests, the majority have none. The desks are much too broad, measuring two feet across.

Children of 5 or 6 years of age use forms for desks, and forms (with sloping back-rests) for seats.

With the forms and desks as at present arranged, children have to stoop over their books, and their feet hang some distance from the ground.

By re-arrangement of desks and seats matters could be improved, but until suitable desks with seats attached are provided the arrangement cannot be considered as satisfactory.

3. *The British Infantry adults and elder children's school* is not used by children, all children of "The Queen's" Regiment going to the Cavalry school.

In spite of the room having an inner and outer verandah on either side it is well lighted; better so than the Cavalry school. This difference is due to the fact that (1) there are no shades over any of the clerestory windows; (2) the upper 2-thirds of the verandah doors on either side are of glass.

Windowshades are not required for this room owing to the fact that it is not used during the morning; in this respect the lighting question differs from that of the Cavalry school.

The desks are for adults and are used by them only. No alterations in desks or improvement in lighting is necessary.

4. *The British Infantry Infants' school* is used in the afternoon only, for a sewing class.

The lighting is distinctly bad. To improve it the following alterations are necessary:—

- (1) Remove the sunshades from the clerestory windows, on the north and west sides.
- (2) Make the sunshades over the clerestory windows on the south side moveable.
- (3) Put glass in the two side doors.
- (4) Deepen the north clerestory window.

This is estimated to cost Rs. 80 (estimate attached).



There are no desks, and none are required. The seats consist of small forms with back-rests. They are placed at one end of the room so that the children sit with their backs to the light. This should be attended to, the seats being turned, so that the light may come from the left.

5. *Royal Horse Artillery School*.—This is a converted married quarter, with a verandah on either side.

It is open all the year round. There are no children attending at present, but it may be required for children at any time.

The walls are white-washed. The desks are those supplied for adults; there are none suitable for children. I found them placed so that men sat facing the light; at my suggestion they were turned facing east to get a side light.

The lighting is bad. There are two clerestory windows on each side, and a small window above each door.

The amount of light entering the windows on the south side is much reduced owing to shades: there are no shades on the north side.

The lighting could be improved by—

(1) Putting large panes of glass in the upper two-thirds of the two verandah doors on the north side.

(2) Deepening the clerestory windows on the north side.

This is estimated to cost about Rs. 68 (estimate attached).

These alterations would give a side light from the left if the desks face east.

6. *Royal Artillery Infants' School*.—There is no room set apart for infants, but since there are no children between 5 and 8 years of age belonging to the Batteries here at present, a room is not now required.

I am informed that an estimate has been prepared for converting the west verandah of the adults' school into an infants' school, to be lighted by large clerestory windows. Major Walpole, R.E., Garrison Engineer, tells me that special attention will be paid to the lighting of this new schoolroom.

Care should be taken that proper desks and seats are provided.

The walls of all schoolrooms at this station require colour-washing pale-green.

With regard to the recommendations made above for improving the lighting, I must add that I was accompanied at my inspection by Major Walpole, R.E., Garrison Engineer, Sialkot, whom I consulted and who agreed with me in all the recommendations made.

Estimate of probable expense of making certain alterations to school buildings to improve lighting.

A.—British Cavalry adults' and elder children's school.		Rs.
1. Making 3 sunshade moveable on the south side		30
2. Putting glass in the upper half of the doors on both sides (5 doors)		45
3. Deepening the clerestory windows on the north side (3 windows)		150
B.—British Cavalry infants' school.		
1. Making one sunshade moveable on the south side		10
2. Putting glass in upper half of 2 doors		18
3. Deepening clerestory windows on north side		50
C.—British Infantry infants' school.		
1. Removing sunshades from clerestory windows in north and west sides (4 windows)		2
2. Make sunshade over clerestory window on south side		10
3. Put glass in doors at end of room		18
4. Deepen clerestory windows		50
D.—Royal Horse Artillery school.		
1. Put glass in upper half of the 2 doors on north side		18
2. Deepen clerestory window on north side		50

A. WALPOLE, MAJOR, R.E.,  
Garrison Engineer, Sialkot.

Dated the 23rd February 1907.

# PESHAWAR Royal Field Artillery School.

The lighting of this school is distinctly bad, but it is not necessary to make any suggestions regarding it, since it is to be closed as soon as the Royal Artillery school is ready, that is in about six months time.

Only two small children are attending, a little girl of 5 years of age who does not know her letters sufficiently well to enable me to take her vision accurately, and a boy of 8 years with  $\frac{1}{2}$  vision each eye.

The following photograph shows the children and desk. Also the difficulty the children experience in dipping their pens in the ink.



Illustrating use of men's desks and seats by children, showing proximity of eyes to books and distance of ink.

No special desks are provided for these children, they use the men's desks (height front edge 34 inches, back edge 36 inches) and sit on forms 21 inches high, with their feet on foot-rests 8 inches from the ground, the boys' eyes being 10 inches from the front edge of the desk when sitting upright, and the little girls 7 inches. When stooping over the desk to write the boys' eyes are about 7 inches from his book, the girl's only 5 inches.

In equipping the new Royal Artillery school, the fact that men's desks are not suitable for children should be remembered.

## Royal Artillery School.

As stated above, the Royal Field Artillery school is to be closed shortly, and the children of the Field and Heavy Batteries here are to attend a new school to be made in No. 11 Block of the Royal Artillery Lines.

This block is of the usual Barrack type, with two verandahs on either side, the inner verandahs being bricked in to form rooms. It is intended to convert two of the main rooms into one large room by knocking down the partition wall, to form the adults' and elder children's school, and to do the same with two of the verandah rooms on the north side to form the infants' school.

At present the lighting of these rooms is very bad, totally inadequate for school purposes. It has, however, been arranged to make considerable improvements in this respect.

Major Julian, C.M.G., R.A.M.C., Sanitary Officer, and Captain Skinner, R.E., Garrison Engineer, Peshawar, who accompanied me during my visit to the schools, agreed with me that if the following structural alterations were carried out, the lighting of the school rooms would be sufficiently improved to be satisfactory.

I also understood from Captain Skinner that the money already sanctioned for the alterations necessary to convert the present building into a school, would be sufficient to allow of the improvements mentioned below being carried out.

#### *Adults' and Elder Children's School (R.A.).*

- (1) Deepen, by one foot at least, the four clerestory windows (two on each side).
- (2) Make an extra clerestory window, as large-as possible, on each side.
- (3) Put two dormer windows in the north side of the roof, if the clerestory windows are not found to give sufficient light.

#### *Infants' School (R.A.).*

- (1) Two large windows to be put in the north wall.
- (2) The upper two-thirds of the two doors in this wall to be glass.

I have not seen a plan showing exactly what structural alterations it is intended to carry out with a view to improving the lighting of this school; the above recommendations were made by me verbally to Captain Skinner. If, therefore, they meet with approval, I would suggest that a copy be sent to the local authorities for information and guidance. Some very marked improvement in the lighting is necessary to render the rooms as they stand fit for school purposes.

#### *Right British Infantry.*

*A. The Adults' and Elder Children's School* is held in a Barrack room with two verandahs on either side. The room is lighted by four small clerestory and two fairly large dormer windows on either side. The sunshades are removed from the clerestory windows; this fact, together with the large dormer windows, renders the lighting quite good: no improvement in this respect is necessary. The school is not used by children during the hot weather.

Adults, desks only are provided; the average number of children attending is twenty, all of whom have of necessity to use desks and seats made for men. Adjustable desks to seat twenty children are required for this school.

*B. Infants' School.*—The lighting of this school too is satisfactory, the sunshades having been removed from the four clerestory windows, and there being two large dormer windows. The sunshades are not required at Peshawar during the cold weather, and the school is closed during the hot weather.

*Desks.*—Three men's desks cut down to render them suitable as far as possible for children, are provided for the fourteen small children attending. The height is satisfactory, but if proper infants' desks cannot be provided the present ones should be reduced in width to twelve inches, not including the ink ledge. These desks, however, having a slope, are not suited for kindergarten work.

*The Seats* also are too broad, and the back-rests slope at too great an angle. It is suggested that they be reduced to  $7\frac{1}{2}$  inches in breadth by straightening the backs and allowing the uprights of the back-rests to fit into notches cut into the forms.

#### *Left British Infantry Schools.*

*A. Adults' and Elder Children's School.*—The lighting, which is from three large clerestory windows without sunshades, on either side of the room, is quite satisfactory.

The same remark applies here as in the Right British Infantry School, namely that the sunshades are not required during the winter months, and the school is not used by children during the hot weather. The clerestory windows are deeper than those in the barracks at Rawalpindi, Ambala and Sialkot the type of building being different. Were it possible to considerably deepen these windows at Rawal Pindi and other stations, the difficulty in improving the lighting would be lessened, but in the majority of buildings I have seen the clerestory windows are so near the commencement of the roof as to allow little space for this purpose.

*Desks.*—Only men's desks are provided; some have been cut down a little, the result is that now they are suited neither for men nor children. The seats (forms with sloping backs) are too high for children.

*B. Infants' School.*—The lighting is sufficient so long as the doors are open, when closed it is defective, but could be made quite good at small expense by putting glass in the doors on the north-east side. There are two large clerestory windows above these doors, so it could easily be arranged for the preponderance of light to come from the left of the scholars.

*Desks.*—There are two in the room; one a form used as a desk for kindergarten purposes, and the other an adult's desk cut down, but still much too high for children. The seats are too broad, and the back-rests slope at too great an angle. The remarks made under this heading when dealing with the Infants' school, Right British Infantry Lines, apply.

#### **AMBALA.**

There are six schools here, viz.:

1. British Cavalry Elder Children and Adults' School.
2. Ditto Infants' School.
3. British Infantry Elder Children and Adults.
4. Ditto Infants
5. R. H. A. School.
6. The "Station School."

#### *1. British Cavalry Elder Children's and Adults' School.*

This is a converted married quarter, two quarters having been made into one room by knocking down partition walls. The room is nearly square, measuring  $27 \times 31$  feet. Children from 8 to 14 years of age attend during the day, men in the evening.

The walls have recently been colour-washed pale-green. *Lighting.*—Light is admitted from both sides, there being two doors on either side (east and west), with panes of glass measuring  $7\frac{1}{2} \times 9$  inches in the upper half; three clerestory windows ( $4 \times 1\frac{1}{2}$  feet) on each side, also two windows  $4 \times 5$  feet on the west side.

The preponderance of light is therefore from the west side.

The two windows reach within 3 feet of the floor and 7 feet of the ceiling; the panes of glass are rather small and there is an unnecessary amount of woodwork between them.

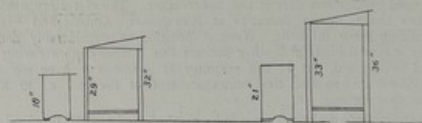
The lighting is defective, especially when the doors are shut on windy days. It could be improved by the following alterations:—

1. Putting in a large window in the west wall, between the existing window and door, where a buttress now exists.
2. Reducing as much as possible the woodwork in the existing doors and windows on the west side, larger panes of glass being used.

These improvements are estimated to cost Rs. 150 (rough estimate attached). If carried out the school-room would be well lighted, nearly all the light would be admitted on one side (west). The desks should be turned to face North so that the main light would be from the left. At present the desks face South, so the main light is from the right.



Desks are of two sizes, thus



The same remark applies to these as in other schools reported on: they are not suitable for children, who when using them stoop over their books and converge their eyes, two of the chief causes of Myopia.

The forms used as seats are moveable and not fixed to the desks, so the distance from the desks varies. They have no back rests.

## 2. British Cavalry Infants' School.

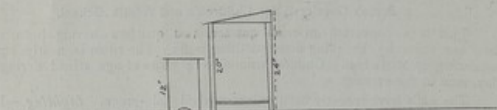
This is held in part of the same building as the Elder Children's School being divided from it by a crosswall. It consists of two Married Quarters converted into one room by removal of walls.

The floor area is 837 square feet. The walls are colour-washed pale-green.

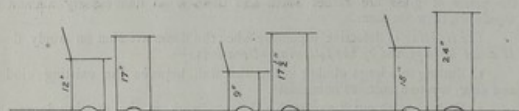
The lighting is much the same as in the Elder Children's School. On either side are two clerestory windows ( $4 \times 1\frac{1}{2}$  ft.), and two doors (upper part glazed): on the west side are two windows ( $5 \times 4$ ).

The lighting could be much improved by reducing the sash work in the doors and windows on the west side, and putting in larger panes and glass. Should this be found insufficient, a large window should be put in the west wall. The cost of these alterations would amount to Rs. 150 (rough estimate attached).

The desks and seats are most unsatisfactory. There is only one desk, with a form without back-rest as a seat. The measurements are:—



This desk seats four; the other children have to use forms as desks and smaller forms for seats.



The forms have back-rests.

Specially designed desks and seats are required.

The desks are now placed in parallel rows facing south, so that the main light comes from the right of the scholars; they should be turned to face

north, but this cannot be done until the old "gallery" is removed, which in my opinion should be done at once.

## 3. British Infantry Adults' and Elder Children's School.

This is large lofty room, built as a band barrack, but now shown on the Military Works books as a school. The walls have been colour-washed pale-green.

The lighting is distinctly bad. On each side are three doors with panes of glass measuring  $7\frac{1}{2} \times 11$  inches in the upper part, and above each is a clerestory window measuring  $4 \times 1\frac{1}{2}$  feet.

The height of the glass in the doors from the floor is 41 inches. The doors open on to a verandah, the clerestory windows open direct to the outer air. The interval between the doors is 17 feet.

The floor area is 2,816 square feet. The total glass area is roughly 85 square feet. The ratio of glass to floor space is 1 to 33: it may be remarked that the ratio in a model school in England is never less than 1 to 5.

There is an equal amount of light admitted on each side.

To improve the lighting, the following structural alterations are recommended:—

(1) One large clerestory window to be put into the middle of the wall on the east side.

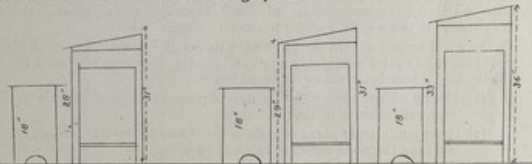
(2) Two windows with large panes of glass to be put into the east wall between the existing doors.

(3) The existing doors on the east side to have larger panes of glass and less wood between the panes.

These alterations are estimated to cost about Rs. 200 (see estimate attached).

The desks are at present placed in parallel rows, some facing north, some south: if the above improvements are carried out, all should face south so that the light may come from the left of the scholars.

The desks vary in height from 28 to 33 inches; all the seats are forms with no back-rests and 18 inches in height, thus



All the desks have foot rails 8 inches from the ground, on which the children rest their feet.

A boy of nine sits with his feet on the foot rail, his leg making an angle of about  $60^\circ$  with his thigh, instead of the correct angle of  $90^\circ$ . He is compelled either to use the foot-rail, or put his feet over it and rest his legs on his heels. He stoops over his desk.

The forms are suitable for men of 5-ft. 7-in. or so. Adjustable desks and seats are required for this school.

## 4. British Infantry Infants' School.

This is one end of the same building as the Infantry Adults' and Elder Children's School, cut off by a cross wall. It is a comparatively small room, but affords ample accommodation for the children attending. The walls are pale-green.

The lighting is poor, there being on each side one window and one door with panes of glass in the upper two-thirds: there is also a door (with glass in its upper two-thirds) in the centre of the wall at the south end of the room. The desks are placed across the room facing this latter door.

In front of the window, in the east wall, is hung a large paper with letters on it, and this cuts off a certain amount of light from an already poorly lighted room.

The lighting could be improved by :—

- (1) Making a large window in the west wall, between the existing door and window.
- (2) Putting large panes of glass in the door and windows on the west side, thus reducing the wood-work, and increasing the glass area.

The improvements are estimated (rough estimate attached) to cost about Rs. 100, and if carried out, the desks should be turned round to face the north wall, so that the light would come from the left and the scholars would not sit facing a light (the door referred to above, in the south wall).

*The desks and seats* are not suited for children of the age attending the school, and favour defective vision.

There are three desks 22 inches high, with seats (having back-rests) 12½ inches high. There is another desk of the same height, but with a form 15 inches high as a seat, and at this desk I saw four children, 4 years of age, sitting with their feet hanging about three inches off the ground, and bending over their books.

I also saw four little girls of the same age (4 years) using a form as a desk; the seat (with back-rest) was too high, and they consequently stooped over their books, and strained their eyes.

The necessity for the provision of suitable desks and seats is obvious.

There is a "gallery" with 5 tiers of seats in this room: I would recommend its removal.

#### 5. Royal Horse Artillery School.

At present only four elder children attend here, but it is used by men in the afternoon and evening.

The building was specially planned as a school. The room now used for school purposes is 24 feet broad by 52 feet long, giving a floor area of 1,248 square feet. There are no windows at the ends of the room, but on either side are three doors (opening to verandahs) with the upper half glass, and immediately above each door is a semi-circular window. There are also three small clerestory windows in these walls, opening to the external air.

An equal amount of light enters on each side of the room. The total glass area is about 84 square feet, giving a ratio of glass to floor area of about 1 to 15. The lighting is poor but could be improved by :—

- (1) Putting a large window with panes of glass as large as possible in the east wall, where a recess now exists.
- (2) Using much larger panes of glass in the doors on the east side, and thus reducing the wood sashes as much as possible.

These improvements are calculated to cost about Rs. 200 (see rough estimate attached), and if carried out, the desks should be placed so as to face south and thus get the light from the left of the scholar's desks.

*The desks and seats* are not suitable for children. There are two sizes of desks, 29 inches and 33 inches in height, respectively, with forms as seats 19 and 21 inches in height; a boy of 9 years of age, when sitting at one of these desks puts his feet on the foot-rail, otherwise his feet would hang some distance from the floor.

More suitable desks are required, but considering the small number of children attending, probably one desk (with seat attached) suitable for children of 8 years of age would suffice. The present desks are likely to aggravate or cause defects of vision, owing to the faulty position which children must assume when sitting at them.

#### 6. The Station School.

Is in a building lent by the Military authorities and under the management of the chaplain. A certain number of children of military men attend this school; at present there are six such children.

The Educational Department gives the school a grant of about Rs. 60 a month. The furniture belongs to the school.

The school room is oblong, measuring 44 feet in length, 16 feet in breadth and 19 feet in height. There are no windows in one of the long sides, but three in the other; there is also a door three parts glass at either end, with a clerestory window above each.

*The lighting* is good, but a purdah or chick should be hung over the door facing the children.

*Desks.*—The majority of the desks are correctly placed so that the light comes from the left of the scholars; a few face the other way, and should be turned round. The desks are of six sizes; only one seat has a back-rest. Those in present use are being replaced by desks with a seat attached, the seat either lifting, or the desk itself sliding forward, to allow the child to get in. Each child is to have its own desk, the plan having been obtained, I understand, from the Inspector of European Schools, Punjab. Every desk is to have a back-rest to fit into the small of the back; the guide to the height of the back-rest being the height of the front of the desk. The back-rest is not to have a greater slope than 1 inch.

By having the seat fixed to the desk it is ensured that the distance of the front of the seat from a perpendicular let fall from the edge of the desk does not exceed 1½ inch.

None of these new desks are to have cross-bars on the floor to interfere with the feet.

Every desk is to have a foot-rest with a slight slope. The size of the desks is being based on the principle that the height of the seat from the ground should be equal to the length of the scholars legs from the sole of the foot to the back of the knee: this fact having been ascertained by measurement, the dimensions of the desks are found by reference to a "Table" which has been supplied by this officer for the purpose.

If some such system could be adopted for army schools for children, there would be less risk of defects of vision (especially myopia) being caused or aggravated by children stooping over their books.

With regard to my inspection of the schools at this station, I wish to add that Colonel H. Hamilton, C.B., V.H.S., I.M.S., Principal Medical Officer, Sirhind and Jullundur Brigades, very kindly accompanied me and agreed with me regarding the proposed improvements in lighting.

Approximate Estimate of cost for improving school buildings in Ambala by putting in additional doors and windows and slight alterations to existing doors and windows :—

<i>Royal Horse Artillery.</i> —One large window required on each side where a recess now exists in the wall. Window to have panes as large as possible. The doors on east side to be glazed with much larger panes by reducing the wood sashes, glazing not to be lower than four feet from the floor level.	Rs. 200
<i>British Cavalry.</i> —One large window required on west side between existing window and door where a buttress now exists. Existing doors and windows of both rooms on west side to be glazed with large panes and reducing the sash work as much as possible.	150
Reducing sash work in doors and windows on west side, and putting in a large window on this side.	150
<i>British Infantry.</i> —Large room only. One large clerestory window required in the middle of the building wall east side. Also two windows in the east verandah between existing doors required, with large panes. Existing doors on east side to be glazed with large panes by reducing the wood sashes as much as possible.	200
<i>British Infantry (Infants' School).</i> —Part of main building. Door on west side to be glazed with larger panes. Window on west side to be glazed with larger panes. New window on west side between the existing door and window.	130



## ABSTRACT OF COST.

	Rs.
Royal Horse Artillery . . . . .	200
British Cavalry . . . . .	150
Do. Infants . . . . .	150
British Infantry, main . . . . .	200
Do. Infants . . . . .	100
Total	Rs. 800

(Sd.) R. REES,  
Supervisor, Sub-Div. Officer,  
South Sub-Division, M. W. Services.

AMBALA,  
28th January 1909.

## RAWALPINDI.

## Royal Artillery Infants' School.

The room used at present is badly lighted, there being only one door (upper half glazed), and three small clerestory windows on either side, also a door with the upper half glazed at one end of the room.

The lighting is so poor, the schoolmistress tells me, that during the winter months it is necessary at times to have the gas lighted during the school hours.

To improve the lighting it is suggested that—

(1) The "gallery" which now stands against the north-east wall be removed and a large window be put into that wall.

(2) The sunshades over the clerestory windows be made movable.

These improvements are estimated to cost Rs. 104 (estimate attached). If carried out, the desks should be put across the room facing east, and the glazed door at the end of the room should be covered so that the children may not sit facing the light. This would give a good light from the left.

**Desks.**—Three sizes are provided. One of these is an experimental desk, specially designed for small children. The seat is fixed to the desk stand and is 14 inches in height. The scholars edge of the desk is 22 inches from the ground. The distance of the front of the seat from a perpendicular line let fall from the edge of the desk is half an inch. Fuller details regarding the desk will be given under "General Remarks." The principle on which it is made is correct.

The other desks in use are not suitable for small children. The following photograph shows one of these desks, also the seat of the experimental desk in front of it:—



R. A. INFANTS' SCHOOL, RAWALPINDI.

Illustrating unsuitability of the present standard pattern infants desk, showing the hanging of feet, the distance of ink-pot, and absence of back-rest. (The seat in front is of a suitable pattern).

It will be seen that the children's feet barely reach the foot-rail, that there is no back-rest to the form. The photograph was taken to show lighting from the left, the proper direction.

## 2. British Infantry Infants' School.

This school room is a converted married Sergeant's quarter, and is badly lighted. The building is not suited for a school.

To improve the lighting, it is suggested that a large window be put in the centre of the north wall, and that the sunshades over clerestory windows be converted into hinged pattern. These alterations would cost about Rs. 71 (estimate attached). If carried out the desks would have to be placed across the room facing east. I found the desks placed in the worst possible position for the light, namely, a light from the right, and the children sitting facing the glare from a glazed door. The faulty position of the desks and their unsuitability are shown in the photograph on page 5. New desks of an approved pattern should be supplied.

## 3. British Infantry Adults' and Elder Children's School.

The building was specially planned as a school, but the type is not good. The main room is so narrow that to arrange the classes the desks have to be put in parallel rows in the length of the room.



B. INFANTRY SCHOOL, CHURCH LINES, RAWALPINDI.

Illustrating the defective arrangements of desks being set with back to the light, and the unsuitability of the same desks being used by men and children.

On either side of this room are an equal number of comparatively small windows; the result is, the children have to sit facing one set of windows, with the other set of windows behind them. This room is used by 26 children in the morning, and about 70 men in the afternoon. If the desks were placed across the room to get a side light, the seating accommodation for men would be insufficient, since the number of desks would have to be reduced. The amount of illumination is sufficient. The necessity for placing the desks in the length of the room and facing the light is unfortunate, but there is very little glare, the glass in the windows being about 8 feet from the floor.

**Desks.**—Only one size is provided, and this is much too large for children. The edge of the desk is 34 inches from the ground and the majority of the seats are 21 inches high. A few seats are 19 inches high. It cannot be arranged for a certain number of desks to be kept for children only, since all are required for men daily.

**Recommendations.**—Considering that the British Infantry (Church Lines) Infants' school is very badly lighted, and that the building is unsuitable for school purposes; also that the present adults' and elder children's school is much too narrow, I suggest that the latter building be widened by including the present verandahs.

If this were done, (1) the present small class room at the end of the school would make an excellent Infants' school; (2) the desks in the large class room could be placed across the room to get a side light, and (3) there would be ample accommodation for men.

The large class room at present will not accommodate the men without over-crowding. Dr. Newsholme is of opinion that "good average requirements for schools are, for each scholar, 150 cubic feet, and 15 square feet of floor-space, whereas this class room, with 70 men attending, gives 126 cubic feet and 10.5 square feet. In calculating the cubic capacity for purposes of ventilation I have disregarded height above 12 feet.

#### 4. British Cavalry Infants' School.

This is held in a long narrow room—an inner verandah bricked-in, with two doors and two clerestory windows on one side only. No light is admitted on the other side, or at the ends of the room.

The amount of light is insufficient. On a bright day the lighting is indifferent, on wet or cloudy days the schoolmistress tells me that she has to take her lamp in, or suspend work on account of defective lighting.

Not only is the lighting defective, but the desks are now so placed that the light falls on the right of the scholars. See photo on page 28. To arrange the desks differently will be difficult until the "gallery" which now stands at one end, is removed; this I recommend to be done, and the desks turned round so as to get a side-light from the left.

The desks are 29 inches high, the seats 21 inches; a child of seven has its feet 7 inches from the ground, unless there is a foot-rail; but they are used by children as young as five.

The lighting could be made satisfactory by putting two large windows in the south-east wall. This is estimated to cost Rs. 50 (estimate attached).

The desks and their position with regard to the light are shown in the photograph on page 27.

#### 5. British Cavalry Adults' and Elder Children's School.

This is a barrack room with an inner and outer verandah on each side.

As can be imagined, the room is badly lighted, being dependent for light on that which comes through the archways leading to the inner verandah. (See photo.)



Illustrating the defective lighting in rooms which are re-appropriated Barrack rooms, with double verandahs.

There are three small clerestory windows on either side, but they admit very little light.

On dull days gas has to be used; the schoolmaster tells me that on two days last week (February) the gas had to be lighted during the morning.

The desks are intended for adults and are not suitable for children. The seats have no back-rests. Adjustable desks and seats are required.

To improve the lighting of this room is a difficult matter. At my inspection I was accompanied by Captain Winter, R.E., Garrison Engineer, Rawalpindi, and we came to the conclusion that the following alterations would lead to better lighting:—

(1) Two skylights to be put on the ridge of the roof, between the existing dormer windows.

(2) Make two arches each 6 feet wide in the west wall of the main room, opposite the fire places.

(3) Make the sunshades over the clerestory windows hinged, or removable: they are at present fixed and keep out light.

(4) Put four windows in the west wall between the inner and outer verandahs.

Paper which has been pasted over the glass in some of the doors should be removed.

These alterations are estimated to cost approximately Rs. 490 (see estimate attached). The lighting would then be considerably improved, but I doubt whether it would even then be as good as it should be in a school.

Children sitting at the desks now face the light: they should be put across the room, and not in the length of it as at present.

#### 6. West Ridge Schools.

The elder children's school is held in a large fairly well lighted room. It is lighted by a number of small windows, 16 inches by 58 inches, with small diamond-shaped panes of glass, on the north and south sides. It is one of the best lighted schools of those I have visited. The ratio of glass to floor area is approximately 1 to 18. The lighting could be considerably improved by putting windows, with large panes of glass in the north wall, between the present windows. This is estimated to cost Rs. 200.

At my first inspection I found the majority of desks arranged in parallel rows in the length of the room, so that the scholars sat facing the light, and with their backs to the other set of windows. These desks have now been placed across the room so as to obtain a side light. But the number and size of the windows on each side being equal, there is a cross light and double shadows. The desks and forms are of varying height, some fairly suitable for children but not for men, others suitable for men only.

I noticed three children about 8 years of age sitting at a desk—the form was 20 inches in height, the front edge of the form 6 inches from a perpendicular let fall from the scholar's edge of the desk; so to reach the desk, which was 29 inches in height (scholar's edge), they had to bend over. These children were stooping over their books writing, with their eyes 2½ or 3 inches from the book! one of these children I found to be suffering from a high degree of myopia; the other two children were probably unconsciously copying the example of the elder myopic child.

In the Infants' School small desks are used and are suitable, but here again they are placed so that the children sit with their back to the light; they could easily be correctly placed.

There are four of the experimental desks in use, of three different sizes, and most satisfactory. A description of these desks will be found further on under "General Remarks."

The lighting is by three small windows on either side, and is only fairly satisfactory. It could be improved by enlarging these windows.

All school rooms at Rawalpindi should be colour-washed pale-green the glare from the present white-washed walls is trying to the eyes.



Estimate of probable cost of alterations to R. A. Infants' School, Rawalpindi.

Items.	Quantity.	Rate.	Per	Amount of each.
R. A. School. Infants' room . . . . .	...	R. a. p.	...	R. a. p.
Providing a large window 8' by 4' . . . . .	...	...	...	...
Brickwork in lime, 1' x 12' x 6' x 1½"=108 . . . . .	...	...	...	...
Deduct window, 1' x 8' x 4' x 1½"= 48 . . . . .	60 cft.	29 0 0	% cft.	17 0 0
60 cft.				
Deodar woodwork, new, 1' x 28' x 5' x 4' . . . . .	4 cft.	2 0 0	cft.	8 0 0
Glazed window 8' x 4' . . . . .	32 sft.	0 14 0	sft.	28 0 0
Demolition, painting, plaster, etc. . . . .	...	...	...	10 0 0
Converting the tops of the existing sunshades to hinged pattern . . . . .	6	6 0 0	each	36 0 0
Total . . . . .				99 0 0
Add contingencies at 5 per cent. . . . .				5 0 0
				104 0 0

(Sd.) RAM PRASAD, Sub-Divisional Officer,  
Military Works Services, Rawalpindi.

Estimate of probable cost of alterations to B. I. Infants' School, Rawalpindi.

Items.	Quantity.	Rate.	Per	Amount of each.
B. I. Infants' school at the end of No. 6 Barrack . . . . .	...	R. a. p.	...	R. a. p.
Opening a window 4' x 5' . . . . .	...	...	...	...
Brickwork in lime 1' x 7' x 7' x 2"=98 . . . . .	...	...	...	...
Deduct window 4' x 5' x 2"=40 . . . . .	58 cft.	29 0 0	% cft.	17 0 0
58				
Deodar woodwork, new Chamkut 1' x 21' x 4' x 5' . . . . .	3 cft.	2 0 0	cft.	6 0 0
1½' glazed window, 1' x 4' x 5' . . . . .	20 sft.	0 14 0	sft.	18 0 0
Demolition, painting, cleaning rubbish, also cost of hold-fasts . . . . .	...	...	...	9 0 0
Converting the tops of sunshades to hinged pattern sunshades . . . . .	3	6 0 0	each	18 0 0
Total . . . . .				68 0 0
Add contingencies at 5 per cent. . . . .				0 0 0
				71 0 0

(Sd.) RAM PRASAD,  
Sub-Divisional Officer,  
Military Works Services, Rawalpindi.

Estimate of cost of alterations to British Cavalry Schools, Rawalpindi.

	Rs.	Rs.
1. Infants' School—Putting two windows 4' x 4' in the east wall . . . . .	25	each 50
2. Adults' and Elder Children's School—		
(a) Putting two skylights on the ridge of the roof . . . . .	150	" 300
(b) Knocking two arches each 6 feet wide in the west wall . . . . .	40	" 80
(c) Hinging sunshades . . . . .	...	10
(d) Four windows in west wall . . . . .	25	" 100
TOTAL . . . . .		540

(Sd.) R. WINTER, Captain, R.E.

Rough estimate for improving the lighting of the school at West Ridge, Rawalpindi.

No. 2101, dated 1st April, 1907.

FROM

THE GARRISON ENGINEER II.  
MILITARY WORKS SERVICES, RAWALPINDI.

TO

MAJOR T. W. GIBBARD, R.A.M.C.

SIR,

I understand you require an estimate of cost of improving the lighting of the Chapel School at West Ridge, by putting in extra windows in the north wall of the building.

I think the best way of carrying out your suggestion is to increase the size of 7 of the 14 windows; these at present are 6 feet x 2½ feet=15 square feet each. They can be increased to 6 feet x 4½ feet=27 square feet. So the total lighting area of that wall will be increased from (14 x 15) 210 square feet to (7 x 15 + 7 x 27) 294 square feet, or 84 per cent.

The cost of the work would be roughly about Rs. 200.

C. H. BLACKBURN,  
Garrison Engineer II,  
Military Works Services, Rawalpindi.

## GENERAL REMARKS.

## Vision.

Total number of children over 7 years of age seen . . . . .	290
Number found to have defective vision . . . . .	35
Percentage of cases with defective vision . . . . .	12 per cent.

## Numbers by Stations.

Station.	Number seen.	Number with defective vision.
Nowshera	9	2
Sialkot	42	4
Peshawar	38	3
Ambala	60	6
Rawalpindi	141	20

Of the 35 cases of defective vision, 26 were hypermetropia or h. astigmatism, 5 myopia or m. astigmatism, 3 mixed astigmatism, and 1 an old injury. Details showing Retinoscopy results, etc., are attached.

*Remarks*.—Children were seen in the first instance in the school rooms, and any found not to have full vision, were seen later at the station hospital. In addition to vision, want of balance of muscles was roughly tested.

The small number of cases of myopia is accounted for by the fact that the great majority of children seen by me were below 12 years of age, whereas myopia attains its greatest frequency between the ages of 12 and 18. Hypermetropia is the rule and myopia very rare in children below 8 years of age.

In India the provision of suitable desks for children, and the improvement of the lighting of schools is if possible a matter of greater importance than in England, on account of the fact that in this country there are so many causes for enfeeblement of health, such as malaria, residence in a tropical climate, etc.

Enfeebled health means weakened muscles and tonics of the eye. Given therefore a child in a poor state of health, bending over a faulty desk in a badly lighted room (conditions which exist in our army schools in India), it is easy to understand the strain there must be on the eye-muscles and tonics which, being weakened, stretch, the eye becomes elongated and myopia results. Or if such a child be hypermetropic, the strain and convergence of the eyes leads to internal strabismus.

## The early detection of visual defects in children.

The importance of this cannot be sufficiently emphasized. "If at the beginning of the school life, abnormal states of refraction were carefully corrected by suitable glasses, we should hear much less of the harmful influence of the schools upon the eyesight of our children" (Risley).

According to Worth, nearly 75 per cent. of cases of unilateral convergent squint appear before the end of the fourth year, and in 53 per cent. of alternating cases, the deviation was seen before the end of the second year.

I therefore suggest that the eyes of all children should be examined by a medical officer before they commence attending school, and that the parents be questioned as to whether they have noticed any tendency on the part of the children to squint.

It should also be clearly understood by schoolmasters that it is part of their duty to report at once any visual defects or suspicion of such, they may notice

The children are constantly under the observation of the schoolmaster. Should he, for instance, notice that a child in reading holds the book unusually near the eyes, he should send the child to hospital to have his eyes examined. Should he notice that a child is not easily able to see the blackboard, he should not simply give the child a front seat and do nothing more, but should see that medical advice is obtained.

It should not only be his care to see that the children do not assume faulty positions whilst sitting at desks, but that the main light is from the left, and that blackboards are so placed as to be in a good light.

Considering the fact that I found cases of squint which had had no treatment, and that in some cases I saw desks placed without any regard to the direction of the light, it would appear that schoolmasters fail to realize in some instances their responsibilities in preventing the deterioration of eyesight. I would suggest that their attention be drawn to the matter.

*Printed instructions on the following lines might be issued to schoolmasters and posted in school rooms.*

## Duties of teachers in connection with eyesight.

Schoolmasters and schoolmistresses must understand that it is part of their duty to assist in preventing deterioration of the eyesight of children. With this object in view, they will pay particular attention to the following points:—

1. Take care that children keep their work at least 12 inches from the eyes. Any child who stoops over the desk to lessen this distance should at once be checked.

2. See that the desks are so arranged that the light is from the left of the scholars. The preponderance of light must never be from the right, or when writing, the shadow of the hand will be cast on the part of the book which should be seen best.

If possible children should not sit facing windows or glazed doors, neither should they sit with their backs to the main light, or the shadow of the body will be thrown on the books.

3. Report at once any defects of vision, or suspicion of such, they may notice. For instance, should it be noticed that a child squints occasionally, or holds the book when reading unusually near the eyes, or is unable to see easily the blackboard, the schoolmaster should send the child to the Station Hospital to be seen by a Medical Officer.

## DESKS AND SEATS.

Before remarking on the desks at present in use in the schools visited by me, the requirements of a desk suitable for children will be given.

## An Ideal Desk.

1. The height of the seat should be the same as the length of the leg, measured from the bend of the knee to the sole of foot.
2. The depth of the seat from the front to the back should be equal to the length of the child's thigh, measured from the bend of the knee to the back.
3. Every seat should have a back-rest to fit into the small of the back. The level of the front edge of the desk may be taken as a guide for the proper height of the back-rest.
4. The back-rest should not have a greater slope than 1 inch.
5. The distance of the front of the seat from a perpendicular line let fall from the edge of the desk should not be more than 1 inch, or may be 0.



6. There should be no cross-bars on the floor to interfere with the feet.
7. The desk should be from 15 to 18 inches broad, and the slope should not exceed 1 inch in 10.
8. The perpendicular distance of the seat from the edge of the desk should be one-sixth the height of the scholar.

*How far the desks now used in schools in the Northern Command comply with these requirements.*

1. The height of the seat. The seats supplied for elder children are in all cases too high, being intended for men. The exact height has been given when dealing with each school; it varies between 18 and 24 inches, whereas a child of 4 feet to 4 feet 6 inches requires a seat 14½ inches in height, and a child of 4 feet 6 inches to 5 feet a seat of 16 inches in height.

The seats being too high the children stoop over the desks. The height of the seats in Infants' schools is fairly correct in many cases.

2. The width of the seat.—In all cases those supplied for elder children are too wide.

- 3 and 4. Back-rests.—In very few instances are these provided, and even when provided they are at too great a slope.

5. The distance of the seat from the desk.—In five desks only (R.A. Infants and West Ridge School, Rawalpindi), have I found this correct, the seat being fixed to the desk below. In all cases movable forms are used as seats, and generally placed too far away. The result is that to reach the desk the body is bent, and the head not being supported by the spinal column falls forward towards the desk and books, as the muscles of the neck become tired.

6. Cross-bars are to be seen on nearly all desks in the adults and elder children's schools. With the present plan of supplying adults' desks for elder children they are necessary, otherwise the feet would hang some inches from the ground, in fact in many cases now the feet do not reach the cross-bar.

7. The slope of the present adults desk is correct, but flat desks are required for Kindergarten work in Infants' schools. Flat desks not being supplied, forms are used in some cases.

8. The height of the desks in nearly all cases in adults' and elder children's schools is out of all proportion to the height of the children using them.

**Recommendations with regard to desks and seats.**

In considering these recommendations I would draw attention to the fact that—

1. Infants use a separate room and set of desks to adults and elder children. A special desk therefore of a distinct pattern can be provided for them.
2. Adults and elder children use the same room, and on account of want of space, the same desks.

It cannot, I think, be conveniently arranged for a separate set of desks to be kept for elder children. It would involve moving desks in and out of the room daily, because the whole of the space and desks are required by men in the afternoon and evening. The only exception is the school at West Ridge, Rawalpindi, where the room is exceptionally large. In some schools moreover, it would be difficult to find room to put the children's desks if moved out to make room for the adults' desks.

Special desks are not therefore admissible for elder children, adjustable desks are required.

*Desks for Infants' Schools.*—In the majority of Infants' schools (with the exception of the R.A. and West Ridge schools, Rawalpindi, where a few experimental desks have been provided) either adults' desks have been cut down to make them suitable for Infants, or forms are used as desks. Neither of these arrangements is satisfactory. In some cases the desks are still too high, in practically all they are too broad. Kindergarten work cannot be carried out on a sloping desk, hence the use of forms.

The seats too are unsatisfactory; they are not fixed to the desks, the majority have no back-rests, and those that have, slope at too great an angle.

The whole arrangement is unsatisfactory and favours the development of squint, myopia, spinal curvature, and other deformities.

The following photograph shows the present pattern Infants' desk; in front of it is seen the new experimental desk. The difference in the breadth and height of the desks and seats is very noticeable.



*A Comparison between a suitable (experimental) Infants' desk, and an unsuitable (standard plan) Infants' desk.*

Below will be seen children sitting at these desks, with the light properly directed from the left. (I may add that when I first visited this school I found the desks so placed that the children sat with their backs to the light.)



The same is seen. The children in front are seated comfortably, and those behind are inclined to stoop, their feet barely touch the foot-rail, the ink is too far away, and there is no support for the back.

All the children sitting at the large desk are 6 years of age, all at the experimental desk are 5. It will be noticed that the children at the large desk are inclined to stoop, their feet barely touch the foot-rail, the ink is too far away, and there is no support for the back.

This is quite a good desk compared with some I have seen in Infants' schools, for instance see the photograph on page 5 (R. F. A. Infants' School Peshawar).

The experimental desk shown in these photographs is that which I propose should be supplied to all Infants' schools.—The following table gives the dimensions of this desk, which I suggest be made in three heights.

	No. 1.	No. 2.	No. 3.
Height of scholar's edge of desk from floor . . . . .	18½"	21"	23½"
Breadth of desk . . . . .	12"	12"	12"
Length of desk . . . . .	7' 6"	7' 0"	7' 6"
Height of seat from floor . . . . .	10½"	12"	14"
Breadth of seat . . . . .	7"	8"	9"
Height of back-rest . . . . .	5"	9½"	9½"
Slope of back-rest . . . . .	½"	½"	½"
Distance of front edge of seat from a perpendicular let fall from scholar's edge of desk . . . . .	½"	½"	½"

The ink-well is 9½" from the front edge. The front edge of the desk (5 inches) turns back at an angle of 45 degrees for reading: the groove where this takes place is seen in the photograph.

Each desk seats 5 children. If made locally it is estimated to cost Rs. 27-8.

A plan (No. 3) of this desk is attached, also a copy of the present Standard plan of Infants' desks for comparison.

Adjustable desks for adults and elder children.—There can be no question as to the necessity for providing a certain number of adjustable desks for the use of elder children attending adults' schools. Elder children vary in age from 7½ to 14 years. The unsuitability of the unaltered adult's desk for a child of any of these ages is shown, in perhaps rather an extreme case, in this photograph.



LEFT B. INFANTRY SCHOOL, PESHAWAR.

Illustrating the unsuitability of the unaltered adult's desk for a child.

Note how near the child's eyes are to the desk; the result is that accommodation and convergence are strained, and the eye-ball is compressed by the recti muscles. (Fortunately children would seldom be required to sit at such a desk, since in nearly every school there are a certain number which have been cut to lower them.)

To overcome this, as has been mentioned above, a number of adults' desks have been cut down. The result cannot be considered satisfactory. They are not thereby rendered suitable for children in all respects, as can be seen in this photograph.



B. INFANTRY ADULTS & ELDER CHILDREN SCHOOL, CHURCH LINES, RAWALPINDI.

Illustrating the unsuitability of the adult's desk, even when cut down, for children.



and they are most certainly unsuitable for men. (See photograph below).



LEFT B. INFANTRY SCHOOL, PESHAWAR.

Illustrating how the "cut-down" adult's desks are unsuitable for men.

It might be thought that the difficulty could be overcome by hinging the footings of desks and forms, so as to be able to raise or lower them, as necessary, two heights being fixed, one for Standards 2, 3 and 4, and one for Standards 5, 6 and 7.

A method by which this could be done at small expense is shown on attached Plan (No. 1), kindly prepared for me by Captain R. B. Skinner, R.E., Garrison Engineer, Peshawar. The dimensions shown in the Plan are those of a full-sized adult's desk. The distance of the hinges from the ground would depend upon the height of the desk and form and the height required. As regards height required I suggest the following:—

Standards.	Height of seat from the floor.	Height of scholars edge of desk.
2, 3 and 4.	14 inches.	23½ inches.
5, 6 and 7.	16 inches.	25½ inches.

The ages of children in standards 2, 3 and 4 vary from 7½ to 11 years, and in standards 5, 6 and 7 from 10½ to 14 years.

This method of raising and lowering desks might be given a trial; without seeing one in use it is impossible to give an opinion as to whether the seats would be strong enough to bear the weight of men, but the bolts, etc., would I am afraid be constantly getting out of order, and the desks would not be rendered suitable in other respects.

Undoubtedly the best arrangement would be the supply of adjustable desks and seats of the kind used in England.

I have been unable to obtain an illustration or details of these desks, but hear from a Calcutta shop that the price of such a desk, to seat one child only, would be from Rs. 45 to Rs. 55. The cost therefore would probably be considered prohibitive.

If so, I suggest that desks be made locally on Plan No. 5 attached. This desk to seat four children or men, is estimated to cost about Rs. 35. If a standard plan was fixed on, the iron standards could probably be obtained from England in large quantities at a cheaper rate than if made locally, thus reducing the cost of the desk.

Should this form of desk be considered suitable, I would suggest that a few be made and issued as an experiment in order that any defects be rectified before a Standard Plan is adopted.

In fixing the dimensions of the proposed desk I have been guided by those laid down by Priestly Smith.

Possibly reference to plans obtained from England of the latest pattern adjustable desks and seats may suggest some better form of desk. I am of opinion that both the desk and seat should be adjustable, and not the seat only with a folding foot-rest for the use of children.

*The dimensions of the desk and seat I propose are:—*

Breadth of desk	17 inches.
Length of desk	9 feet.
Height of desk at lowest	21 inches.
Desk to move up, 1 inch at a time to	29 do.
Slope of desk	1 in 10
Distance of ink-well from scholar's edge of desk	13 inches.
Height of seat from floor when at its lowest	13 do.
Seat to move up 1 inch at a time to	18 do.
Breadth of seat	9 do.
Height of back-rest from seat	8 do.
Slope of back-rest	1 inch.
Distance of front edge of seat from a perpendicular line let fall from scholar's edge of desk	1 inch.

The back-rest to be hinged, so as to turn down when used by men. The length of the desk is shown as 9 feet (to seat 4 men), but this must vary according to the size of schoolroom in which it is to be used. If 9 feet long either the wood for the seat and desk must be 2 inches in thickness for strength, or there must be a third support in the centre; shorter desks could be made lighter.

I have put the ink-well 13 inches from the edge of the desk to enable children to reach it easily.

It may be said that men would not take the trouble to adjust the desks before using them, and alter them back to the height for children afterwards. There should be no difficulty in this respect, schoolmasters should be capable of seeing that this is done; medical and regimental officers should also check this when visiting schools and report any neglect. There is, I believe, at present no standard plan of desk for elder children; a copy (Plan No. 4) of that authorized for adults, which is also used by elder children, is attached for reference and comparison.

The approximate cost of supplying the new pattern desks for Infants (Plan No. 3) and elder children (Plan No. 5) at the five stations visited by me will be found overleaf.

Approximate cost of supplying new pattern desks for Infants and Elder Children at the five stations visited by me.

INFANTS.			ELDER CHILDREN.	
Schools.	Average attendance, 1906.	No. of desks required.	Average attendance, 1906.	No. of desks required.
NOWSHERA				
Infantry School . . . . .	10	2	13	4
SIALKOT				
Amalgamated B. I. School . . . . .	12	3	27	7
R. A. School . . . . .	...	1	3	1
PESHAWAR				
R. A. School . . . . .	...	2	...	3
Left B. I. School . . . . .	...	11	3	8
Right B. I. School . . . . .	13	3	3	5
RAWALPINDI				
B. I. School, Church Lines . . . . .	8	2	11	3
R. A. Schools . . . . .	5	1	...	...
B. Cavalry School . . . . .	10	2	10	4
West Ridge School . . . . .	31	3	36	9
AMBALA				
B. Cavalry School . . . . .	...	3	...	4
B. Infantry . . . . .	...	3	...	7
R. A. School . . . . .	...	...	...	2
Totals . . . . .	...	28	...	52

NOTE.—Each Infant's desk to seat five.

Each elder children's to seat four.  
The average attendances have been obtained from the Inspector of Army Schools, First Circle, whom I also consulted regarding the number of desks required.

Cost of supplying Infants' desks ..... 28 @ 27-8 = 770 Rs.  
" " " Elder children's desks ..... 52 @ 35-0 = 1,820

Approximate cost of supplying new pattern desks to schools of 1st Circle (Schools) i.e., 1st Peshawar, 2nd Pindi and 4th Quetta Divisions.

INFANTS.			ELDER CHILDREN.	
Schools.	Average attendance, 1906.	No. of desks required.	Average attendance, 1906.	No. of desks required.
NOWSHERA				
Infantry School . . . . .	10	2	13	4
SIALKOT				
Amalgamated Schools . . . . .	13	3	27	7
R. A. School . . . . .	...	1	3	1
PESHAWAR				
R. A. School . . . . .	...	3	...	3
Left B. I. . . . .	11	3	8	3
Right B. I. . . . .	13	3	21	5
QUETTA				
Amalgamated School . . . . .	26	6	42	12
New Cantonment . . . . .	10	2	3	2
HYDERABAD (Sindh) . . . . .	12	3	6	2
MANORA . . . . .	...	2	...	2
KARACHI . . . . .	15	3	12	3

INFANTS.				ELDER CHILDREN.	
Schools.	Average attendance, 1906.	No. of desks required.	Average attendance, 1906.	No. of desks required.	
RAWALPINDI					
Infantry Church Lines	8	2	11	3	
R. A. School	5	1	...	...	
Cavalry	10	2	14	4	
West Ridge	31	3	36	9	
KALABAGH	3	1	2	1	
BARA GALLI	4	1	3	1	
KHANSPUR	...	2	14	4	
GHORA DHAKA	8	2	12	3	
KHYRA GALLI	...	1	3	1	
BARIAN					
R. A. School	12	3	10	5	
Infantry	5	1	13	4	
KULDUNNA	10	4	20	5	
GHARIAL	7	2	8	2	
UPPER TOPA	8	2	4	2	
MURREE DEPOT	11	3	8	4	
CLIFTON DEPOT	22	5	21	6	
CAMPBELLPORE	5	1	8	2	
ATTOCK FORT	...	1	11	3	
MALLA MANSOOR	...	1	8	2	
Total		69		105	

NOTE.—Each Infant's desk to seat five, and elder children's four.

Cost of Infants' desks ..... 69 @ 27-8 = 1,876-8 Rs.  
Cost of desks for elder children ..... 105 @ 35 = 3,675

LIGHTING.

The defects in lighting have been noted in dealing with each school, and proposals made with a view to improving it. In reading this report it will be noticed that almost without exception the school rooms are badly lighted. This is due to the fact that the majority of schools are held in re-appropriated rooms, not originally intended for school purposes, and so constructed as to make it most difficult to light them properly.

A certain number of schools are in barrack rooms, with an inner and outer verandah. A typical building of the kind is shown in this photograph.



Illustrating the difficulties of lighting a barrack-room so as to render it suitable for a school.

It will be seen that the clerestory windows are very small and admit of very little deepening; the only other light which enters the school room (centre rooms) is from doors in the verandahs.



In all such buildings the lighting can be improved by removing the sunshades over the clerestory windows on the north side, and in some stations, during the winter months, those from all such windows. The latter plan is adopted at Peshawar with most satisfactory results, but here the clerestory windows are deeper than at most stations.

Or the sunshades can be hinged, as shown in the following photograph.



*Illustrating hinged sunshades so as to improve the lighting.*

Improvement can be effected also by constructing sky lights (dormer windows) on the ridge, a diffuse light being obtained. But in addition to the defective lighting of the present school rooms, a point which is most noticeable in visiting schools is the fact that in many cases the light is not properly directed on the desks. This is due in some cases to ignorance on the part of teachers of the fact that the preponderance of light should always come from the "left" of the scholars. In other cases it is due to inability on the part of schoolmasters to so arrange the desks as to obtain the above effect, as a result of the narrowness of the rooms, length of desks, or difficulty in arranging classes and black-boards so that a side-light from the left is obtained.

The following photograph shows lighting from the right, a shadow from the hand being cast on the particular part of the paper which should be seen best.

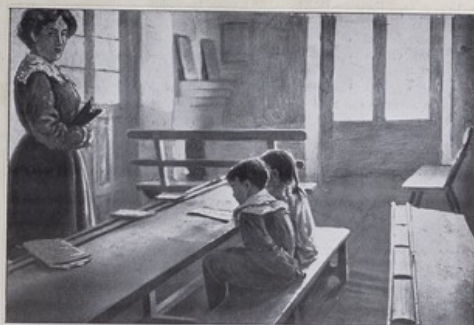


BRITISH CAVALRY INFANTS' SCHOOL, RAWALPINDI.

*Illustrating defective lighting when the light is admitted from the right,*

The next photograph shows lighting from the right and front; the children sit facing the glare from a glazed door.

All that was necessary was to turn the desks round, but the teachers had not thought of this.



BRITISH INFANTRY INFANTS' SCHOOL, (CHURCH LINES), RAWALPINDI.

*Illustrating defective lighting when the light is admitted from the right and front.*

In other instances I have seen the desks so arranged that the children sit facing one set of windows and with their backs to the other (see photo on page 13), so that not only are they sitting in their own shadows, but if they look up the glare from the windows is in their eyes. Were it not for the fact that the lower portions of the windows are covered with wood, this would be most noticeable (and deleterious to the eyes) in the case of the British Infantry school, Church Lines, Rawalpindi.

In this school the rooms are so narrow that it is impossible to arrange the classes so that the desks can be placed across the room, and even if they were placed across the room there would be annoying shadows from cross-lights, due to an equal number of comparatively small windows on each side of the room.

The plan of lighting is defective. If a new standard plan for schools with large windows in one wall only has not been introduced, I beg to suggest the advisability of such being considered.

Before closing the subject of lighting, I would recommend that an order be issued, and embodied in regulations, for walls of all school rooms to be colour-washed pale-green twice a year. Ambala is the only station of those I visited where this had been done. Softer light is obtained, and glare from the walls prevented. Where ceilings exist, they might with advantage be white-washed to reflect light on to the desks.

#### HOME LESSONS.

From enquiries I have made from several schoolmasters I have come to the conclusion that home lessons play practically no part in the production of myopia or other visual defects in the children attending army schools in the Northern Command. If any lessons are given to them to do at home they only take 10 minutes, or at the most half an hour. It is sitting for 4½ hours daily in badly lighted school rooms, at unsuitable desks, which injures the eyes.

## BOOKS AND TYPE.

An important subsidiary cause in the deterioration of eyesight in children is the use of small, ill-defined, closely set type, which even in a well lighted room necessitates holding the book at a shorter distance than 12 inches from the eyes. Bearing this in mind I have looked at the books in use in the schools and with two very notable exceptions, I have found the type large, distinct and well-spaced. The two exceptions, are the Holy Bible "and the" Book of Common Prayer.

According to Appendix VII of Standing Orders for Inspectors of Army Schools, Examiners and teachers 1906, Course of Religious Instruction of Army every lesson a portion of Scripture will be read, in part by the teacher and in part by the children of Standards VI and VII.

A page taken from the Bible, such as is used in all schools, at any rate in the First Circle, is attached. It is unnecessary to remark that the print is much too small for children of any age, even in the best light of schools.

## Jeremiah Lamentations JEREMIAH 48

Jeremiah Lamentations JEREMIAH 48

Jeremiah Lamentations JEREMIAH 48

Jeremiah Lamentations JEREMIAH 48

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Jeremiah Lamentations JEREMIAH 48

A page taken from a Prayer Book is also attached. The Prayer Book is used for children to learn the Commandments from and for Hymn; the type for both is the same.

## FESTIVALS OF MARTYRS AND OTHER HOLY DAYS.

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I beg to suggest that both books be replaced by others, much larger type: they are used in schools for half an hour three days a week and must cause a great strain on children's eyes.

## SUMMARY OF RECOMMENDATIONS.

1. That a new Standard Plan of Infants' desk be adopted for infants' Schools. (Plan No. 3.)
2. That a certain number of adjustable desks, of the pattern used in schools in England, be supplied for elder children; but should the cost of supplying such desks be prohibitive, adjustable desks made locally on plan No. 5 be adopted.
3. That all children should have their eyes examined for commencing squint and other obvious visual defects, by a medical officer (if possible one with some experience of ophthalmology) before commencing school attendance.
4. That the attention of school masters be drawn to their responsibilities in preventing the deterioration of vision in children.
5. That an order be issued, and embodied in regulations, to the effect that the walls of schoolrooms be colour-washed pale-green twice a year.
6. That sunshades from clerestory windows on the north side of all schools be removed, and that sunshades over the other clerestory windows be hinged so that they may be raised during the winter months whenever possible.
7. That the Bibles and Prayer Books at present issued to schools, be replaced by others with larger type.

T. W. GIBBARD, Major,  
Royal Army Medical Corps.

Rawal Pindi:  
4th April 1907.

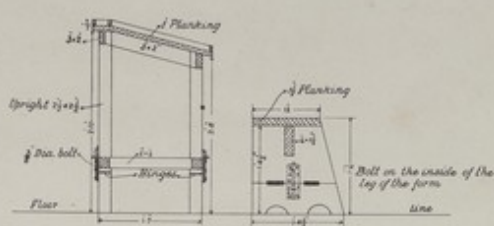


# WRITING DESK & BENCH

SHOWING ARRANGEMENT OF LOWERING & HEIGHTENING

Scale 1/4".

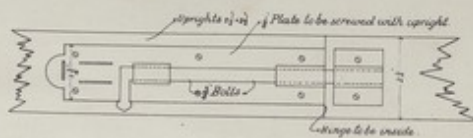
CROSS SECTION



LONGITUDINAL SECTION

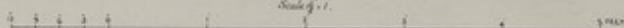


DETAIL OF BOLT

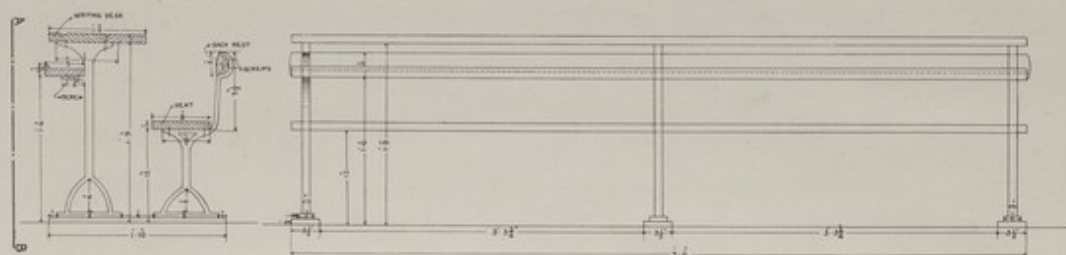


# PATTERN OF EXPERIMENTAL INFANTS' DESK

Scale of 1/2"



## BACK ELEVATION ON A.B.



END ELEVATION

## PLAN

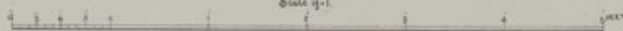




BARRACK FURNITURE  
FOR INFANTS' SCHOOL DESK  
Scale  $\frac{1}{4}$ " = 1'

BARRACK FURNITURE  
FOR INFANTS SCHOOL DESK  
Scale 1/4"=1'

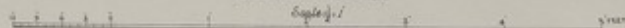
Scale 3/4 = 1.

[illegible]

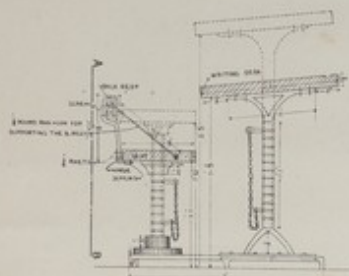
# ADJUSTABLE DESK

FOR  
ADULTS & ELDER CHILDREN

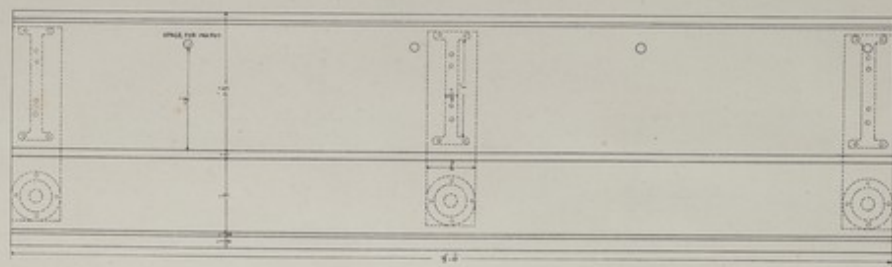
Sample 1



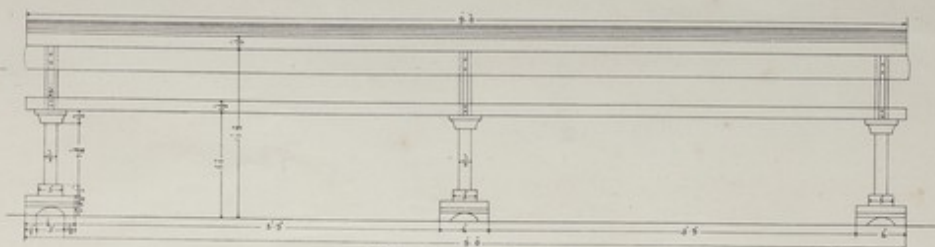
*Note:*  
The seat and writing desk move up by 1' at a time  
from floor, from 12 to 16 to 21 to 26 respectively



END ELEVATION



PLAN



FRONT ELEVATION ON A.B.

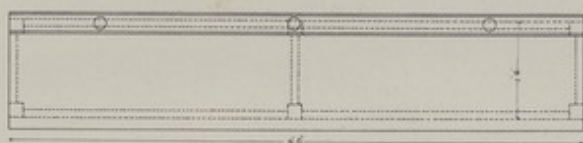


STANDARD PLAN  
BARRACK FURNITURE  
FOR ADULTS SCHOOL DESK

*Redrawn in Office of Director General of Military Works  
from Plan accompanying Quarter Master General's cir-  
cular No 12-B dated 25th March 1866.*

Scale 1/16  
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

PLAN



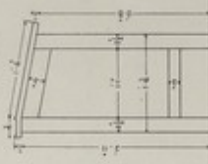
FRONT ELEVATION



SECTION



END ELEVATION



No. 1567-R.

Head Quarters, 2nd (Rawalpindi) Division.

Rawalpindi the 19th April 1907.

From—LIEUTENANT-GENERAL Sir O'MOORE CREAGH, V.C., K.C.B., Commanding  
2nd (Rawalpindi) Division,

To—The Principal Medical Officer, Northern Command.

Sir,

I have the honour to forward herewith the Report called for in your letter No. 46-E. of January 8th, 1907.

Major Gibbard, R.A.M.C., has dealt with the subject most exhaustively, and I entirely agree with the recommendations on page 36 of the Report.

I would recommend that a new standard plan of school house buildings be prepared (the present one is dated 1880, and hardly meets present requirements) which could be used when new school rooms are under construction, with proper provision for scientific lighting of the building. The desideratum being a well-lighted room, with the minimum of glare, and direct sunlight. The subject of artificial light in school rooms also requires consideration. I should also recommend that a few simple rules touching on the cardinal points, should be drawn up, printed, and hung up in a conspicuous place in every school room for the guidance of schoolmasters.

An "adjustable desk" is greatly needed, and if Major Gibbard has succeeded in devising one that would meet the purpose well, it should prove very useful.

I have the honour to be

Sir,

Your most obedient Servant,

H. R. WHITEHEAD,

Colonel, R.A.M.C.,

For G. O. C. 2nd (Rawalpindi) Division.

No. 1230-E.

Head Quarters, Northern Command, Medical Division;

Murree, 7th May 1907.

MEMORANDUM.

Forwarded with reference to your Nos. 39, dated 3rd January 1907, and 576, dated 5th February 1907.

H. HAMILTON,

Surgeon-General, L.M.S.,

For Lieut.-General, Commanding Northern Command.

To—The Principal Medical Officer,

His Majesty's Forces in India, Simla.

The attached exceedingly valuable and instructive report has been drawn up by Major Gibbard, R.A.M.C., Specialist in Ophthalmology, Northern Command, on the vision of British soldiers' children, lighting of schools, types of desks and seats in the same, as the result of inspections at five different stations in the Northern Command:—

- (a) *Eyesight*.—You will observe that 12½ per cent. of the children over seven years have defective vision which is a large proportion. It is satisfactory to note that the parents in nearly all instances provided suitable glasses at their own expense.
- (b) *Lighting*.—This is almost everywhere defective, due chiefly to the fact that most schools were not built as such, but are old barrack rooms re-appropriated: they are in fact everything that a school ought not to be.



\*Peshawar, Now-  
shera, Rawal-  
pindi, Sialkot,  
Ambala.

As we cannot expect to have new schools of an improved type-plan built at these places,\* the next best thing is to carry out the structural alterations as indicated in pages 1 to 17 of the report: the expense would not be very great and the gain in comfort not only to the children but *adults* also, would be inestimable.

(c) *Desks and seats*.—A perusal of the report and a study of the photographs will show how very unsuitable these are and the urgent necessity for the adoption of an improved pattern.

(d) *Books and type*.—Good, with the exception of the Bible and Book of Common Prayer, *vide* pages 29 and 30. These ought to be changed at once for volumes of a larger type.

(e) *Summary of Recommendations*.—I would invite attention to these (page 30) which I can fully endorse.

I may add that when inspecting barracks I invariably visit the schools and have no hesitation in saying that in the majority of places throughout India their condition is *most* unsatisfactory.

The defects brought to light in this report may be regarded as generally applicable.

Adjutant General's Division,

W. L. GUBBINS,  
27th May 1907.

From—MAJOR T. McDERMOTT, R.A.M.C., Ophthalmic Specialist, Eastern Command.  
To—The Officer Commanding, Station Hospital, Lucknow.

Lucknow, 12th May 1907.

SIR,

I have the honour to forward herewith my report on children's eyesight and on lighting, etc., at the marginally-noted\* Army Schools in the Eastern Command, in accordance with letter No. 129, dated Simla, 9th January 1907, from the P. M. O., H. M.'s Forces in India, to the General Commanding, Eastern Command.

My total absence from my permanent station (Calcutta) was twenty-eight days, and I was actually engaged in *bona fide* inspection work in connection with this report on sixteen days. In addition, I was engaged with this work for ten days, after my return to Calcutta, inspecting the eyesight of the children in the local army schools.

During my tour I did a large amount of work at the various stations amongst the men and their families.

I took every care in the examination, but the results may not be, in some instances, the best possible, as, for such young children, it is occasionally necessary to submit them to a prolonged course of atropine before making out their refraction.

A perimeter is an absolute necessity for such work, more especially for the estimation of squints. It is necessary in cases of injury, glaucoma, neuritis and many other affections both for diagnosis and prognosis.

One should be always available for the Command Specialists. The cost would be about £6 (six pounds). Priestley-Smith's and McHardy's are excellent forms.

Another matter that is in need of remedying is the want of a dark room, Dark Room. This latter could be easily kept in readiness at each station hospital. A small room, the walls of which could be dead-blackened, is nearly always available, and could be used for other purposes when not required for eye examinations. At Bareilly and Fyzabad excellent rooms were ready for me. At Meerut there was no dark room available, and it was only after many requests that I was permitted to use the eye ward in the station hospital. The lamps and oil were also inferior, being in nearly every case ordinary hospital pattern lamps, which, in every instance, gave an unsteady and flickering flame, probably from bad oil. I have found that an ordinary Hinks' pattern Duplex wall lamp with the reflector painted white, and using the better kinds of kerosine oil answered excellently.

It would save specialists a large amount of unnecessary trouble, and assist the medical officers doing duty in hospitals, if a small room was prepared in this manner and always available for eye examinations. Windows could easily be covered by black curtains or screens.

I also found that the homatropine tabloids were objected to by children, Homatropine. and I finally purchased homatropine hydrochloride powder which in solution with Cocaine is much more pleasant to use and does not seem to irritate the conjunctivæ so much as the discs do.

I have the honour to be

SIR,

Your most obedient Servant,

T. McDERMOTT,

Major, R.A.M.C.,

Ophthalmic Specialist, Eastern Command.

REPORT BY MAJOR T. McDERMOTT, R.A.M.C. ON ARMY SCHOOLS  
VISITED, AND OF INSPECTION OF CHILDREN'S EYESIGHT,  
EASTERN COMMAND, 1907.

Calcutta, Bareilly, Fyzabad, Lucknow, & Meerut. The total number of children examined by me at the marginally-noted stations was 166 (86 males and 80 females), of whom 43 (25.9%) had appreciable defects of vision (see Tables I and II).

Slight cases of hypermetropia, 5 D to 1 D or so, in which muscular equilibrium was perfect, were considered amongst the normal.

A nominal roll of children suffering from defects of vision and the different forms of eye disease is attached (Tables III and IIIA).

Spectacles were recommended in twenty-four instances, and every necessary explanation as to the importance of wearing them was made to the parents, both verbally and in writing.

Copies of these recommendations were also sent to the officers commanding station hospitals.

The difference between the total number of cases (43) and those included in Tables III and III-A, included minor errors of refraction, about whom it was not considered necessary to make any representations.

The lighting of each school room, other than artificial, examined by me, was found to be faulty.

The proportion of lighting space, apart from woodwork of closed doors, to floor area was:—

	Adults and Elder Children's School.	Infants' School.
Calcutta	1 in 13	...
Bareilly	1 in 11	1 in 10.
Fyzabad	1 in 14	...
Lucknow, British Cavalry	1 in 17	1 in 16.
British Infantry (2)	1 in 19.6	1 in 20.5.
Royal Artillery (new)	1 in 14	1 in 11.
Meerut, British Cavalry	1 in 7	1 in 21.
British Infantry	1 in 21	1 in 20.
Royal Artillery	1 in 14	1 in 14.

This standard of lighting compares unfavourably with that of the School Board in England of 1 in 5 or 1 in 6.

Neither can the lighting be judged from this as the amount of light which enters a room will be affected by many other factors. The position of glass light inlets, in regard to direction, height, etc., will cause considerable differences in the quantity of light in a school.

From my own observations I would classify the different schools:—

Calcutta, Adults' and Elder Children's	Very bad.
Fyzabad Ditto	Do.
Meerut, British Infantry Infants' School	Do.
Lucknow, British Cavalry Schools	Bad.

All the others might be regarded as "indifferent," Bareilly Garrison School being the best in regard to efficiency of lighting.

The former three schools should be condemned for the following reasons, in addition to that of defective lighting:—

*Calcutta Adult Elder Children's School.*

Here two large pillars between the central and two side halls make the central one quite dark, and requiring artificial illumination even on the brightest day. These pillars also interfere with efficient teaching.

In my opinion this building cannot be altered so as to make it suitable for a school.

It has been proposed to convert the ground floor of the Granary Barracks, now the office of the Officer Commanding, Royal Artillery, into a children's school. This building has serious structural defects, the most important of which is a series of cross + shaped pillars supporting arches on each side.

These, if allowed to remain as at present, would materially diminish the light and floor space, and seriously interfere with the efficiency of teaching. The Assistant Commanding Royal Engineer, Calcutta, informed me that the projecting portions of the pillars could be removed. This reconstruction would, in my opinion, give fair lighting, but might possibly be objected to on the grounds of difficulty of teaching an observation of class.

I have been informed that there are objections to additional buildings in Fort William, and I accordingly consider this building would be a marked improvement on the old school.

The present *Infant School* is situated on the second floor of Queen's Calcutta Barracks at the north-east corner. It is lighted by one large window on the north side, and two large doors on the east side. These produce much glare, and, when closed, the inferior glass causes unpleasant irregular refraction of light. Otherwise it is well lighted.

In the proposed arrangements noted above this school would form part of the new school in the ground floor of Granary Barracks.

The lighting is defective. It enters through the glass panels of doors, and through the clerestory windows.

The *Bareilly schools* might be improved in the ways noted below, and by having the colour changed from khaki to light green, approaching to grey. The upper panels of doors should be replaced by glass, and the many small panes in the clerestory windows should be changed for one or two larger panes. The sources of light are north and south.

*Fyzabad school* should be condemned. The light is bad, coming through Fyzabad fanlights over doors, and through clerestory windows. The school, in its present form, is quite unsuited for teaching, being 82½ feet long, and 24 feet broad, making it impossible for one large class to be carried on efficiently, and too narrow to allow the seats to run any way other than across the width.

The *Infants' school* is at present situated in a Staff Sergeant's quarter. This is unsuited on account of the small size of the rooms, and on account of defective lighting and other arrangements.

It was previously carried on in the regimental theatre, a building with the same defects as, and adjoining the elder children's and adults' schools.

*Lucknow schools.*—The schools here are, (1) British Cavalry, (2) British Infantry, two, (3) Royal Artillery (old), and (4) Royal Artillery, new, in course of construction.

This school is a re-appropriated barrack room. It is badly lighted (1 in 17) by clerestory windows and fanlights over the doors. In the monsoons and during dust storms lamps are required. This school could be materially improved by the adoption of the general suggestions noted below. The same remarks apply to the *Infants' school*.

The right and left *British Infantry schools* are of the same pattern with proportional lighting of 1 in 19, that in the *Infants' schools* being 1 in 20. The light comes from clerestory windows, fanlights over doors, and in the case of the *Infants' schools*, from one casement window each. The wings of these buildings are difficult to light, and need not be used. For improvement I would recommend panelling of the doors with glass not lower than 4 feet, as well as the other general recommendations.

The buildings run north and south, thus giving east and west light. Under the circumstances I would recommend that the larger proportion of light should come from the west side, these windows, during the school hours, being least exposed to the direct rays of the sun.

The *Royal Artillery School (old)* has been condemned, and will soon be replaced by the new school. This school is not well lighted (1 in 14) in adults and elder children's school, or in the *Infants' school* (1 in 11).

The type plan seems to have the following marked defects:—

(i) Insufficiency of lighting.

(ii) The windows are too near the floor and should extend higher. They should be 4 feet clear of the floor to prevent horizontal glare. They are placed east and west in the adults' and infants' schools respectively.



(iii). The numerous beams and couplings of the roof absorb a large proportion of the light.

Meerut. *Meerut schools.*—The schools at Meerut are, (1) the British Cavalry, (2) the British Infantry, and (3) the Royal Artillery schools.

Meerut, British Cavalry. In the British Cavalry schools the main sources of light are through glass panels of doors and clerestory windows. Its proportion in elder children's school to floor space is 1 in 7. The shades of the windows require increasing in size to protect the pupils from the direct rays of the sun on the east and west sides. The walls are painted terra cotta and absorb a large fraction of the light.

The proportion of light area to floor space in the Infants' school is 1 in 21.

Meerut, British Infantry. The British Infantry elder children and adults' school, running north and south, receives east and west light from glass panelling of doors, and from clerestory windows. It also has two high casement windows. The light proportion is 1 in 21. The clerestory windows are too high, being 20½ feet above the floor level.

The colour of the walls was a dark slate that could scarcely be disimproved on.

The Infant school is a long (52 feet) and narrow (12 to 15 feet) room on the north side of the adults' and elder children's school. It is not capable of being structurally improved except it be much enlarged towards the north.

The only source of light is through panelling of doors which gives a most irregular and patchy result, with glare from the lower glass areas of doors.

It is quite unsuited for teaching, and should be unhesitatingly condemned, both for faulty lighting, and for teaching difficulties. It is almost impossible to use a blackboard with any reasonably sized class.

Meerut, Royal Artillery. The Royal Artillery school for elder children and adults was during the time of my inspection, being used for an acting schoolmaster's class.

The light, east and west, comes through glass panelling of doors and clerestory windows. Its proportion (1 in 14) is the same in the elder children's and Infants' schools. The walls are of the same colour as the British Infantry school—a medium slate.

A great improvement in these schools would be the colouring of the walls a light greyish-green, and the panelling with wood of the lowest panes of the doors, the latter to prevent horizontal glare.

#### Lighting.

The lighting of all the above schools, otherwise than the three condemned, could be much improved, and with little expense to the State, if the following suggestions be carried out:—

(1) All walls should be coloured a pale-green, approaching to grey, with a three feet darker dado. This could be done with "deadend" paint or colour wash.

(2) All woodwork on walls, and possibly the insides of doors, should be painted white.

(3) Beams, couplings of roof, etc., should be of a light, preferably white, colour.

(4) The clerestory windows should be enlarged to about twice their present size, and increased in number. They should have a gentle slope towards the floor, top and bottom. The woodwork should be reduced, with fewer panes, and painted white, thus giving a larger light area, while the glass should be periodically cleaned, and not painted or rendered translucent. I invariably found the glass dirty.

(5) White enamelling of the interiors of the present sunshades would materially increase the amount of light.

(6) The top panels of doors, above four feet from the floor, should be replaced by large panes of glass, the larger glass area being on the side (left side of pupil) from which the major portion of the light is required.

A good plan would be to have the lower 3 feet 6 inches or 4 feet of doors separate, and, preferably, fitted with venetians. This would materially diminish the existing glare through the lower portions of the open door spaces.

The woodwork of the present glazed panels intercepts a large proportion of light, and at the same time tends to render that admitted of a patchy character. A poor quality of glass also causes unpleasant reflections.

#### School furniture.

The old types of desks and seats in the different schools cannot be considered otherwise than unsatisfactory for children. Their construction and wrong positions cause cramped attitudes and do not give the proper amount of support. There is no question that a fixed seat and desk for each child is the proper standard to aim at, or failing this, an adjustable seat and desk to suit children of different ages and sizes.

There are certain points about these fixed seats and desks which are now considered the most satisfactory:—

(1) The desk should have no raised edges on its upper surface. It should be inclined to the horizon at an angle of 15° for reading and writing, or 10° for writing and 40° for reading. 18 inches breadth would be required for each child, and the width should be not less than 12 inches.

(2) The back edge of the desk should be vertically over the front edge of the seat, or slightly overlap it. Otherwise put, there should be none or a negative seat "distance". This position requires that the seat should fold over, or that the desk should do the same, or run on rollers as in the excellent seats made by Captain M. J. Flannery, Military Works Services, Lucknow.

(3) The seats should be 8 to 9 inches broad, and its upper surface should have hollows in the wood not more than ¾ inch deep to prevent the child slipping forwards or backwards.

(4) A back rest to reach not higher than the centres of the shoulder blades is required. This would be about 8 inches high. It should be vertical or slope slightly backwards.

Failing the provision of single seats and desks, the multiple form recommended by Captain Flannery might be adopted. This type, which I have inspected, has practically all the points above-noted, viz.,—sliding desk, fixed seat, back rest, etc. The desk slides on gunmetal rollers, can be fixed in position by hooks, is substantial, and can be made at a comparatively small cost.

They are made of two heights, 21 and 24 inches desks, to take children of 5 to 6½, and 6½ to 8 years, respectively. They could easily be mapped out into five sections and each section suitably hollowed.

Captain Flannery's combined seat and desk is necessary under the present arrangement by which the elder children and the adults attend the same school at different hours.

This pattern is a combined fixed desk and a seat adjustable by a screw, somewhat after the manner of a piano stool. They are made to seat five pupils. Here, removable foot and back-rests are required for children. For adults they would probably not be necessary.

Separate foot-rests for children might, if necessary, be given, but they are not essential. The same remarks as to the slope, etc., of desks, and the relative positions of seat and desk would apply as in the case of those for the infants' schools.

There are several patterns of the combined seat and desk at the right Experimental seats and desks. (Oxford L. 1.) British Infantry school at Lucknow, and at the 17th Lancers school at Meerut. These all, while a great improvement on the old furniture, had small faults of various kinds due to variations from the above-recommended types.

I also visited several large civil schools, and found that the lighting and the furniture were defective in the majority.

The Calcutta School Book and Useful Literature Society, No. 1, Wellington Square, Calcutta, supply at a cost of Rs. 17, a combined teakwood seat and desk for each pupil at La Martinière College, Calcutta. It has hinges in the centres

of seat and desk, allowing them to fold over. In the ordinary position the desk is inclined to the horizon at an angle of 10 degrees, and when folded, at an angle of 40° to allow of reading. The book rests on a raised ledge. Like all the modern desks I have seen, there is a shelf for books, etc., in front of and under the desk, this latter being grooved on its upper and front part for pen, ink, etc. These desks and seats compare unfavourably in regard to cost, with Captain Flannery's estimates.

Additional.

There are some other matters affecting the sight of children attending Army schools that might be brought to notice. The most important are:—

- (1) The seats and desks are seldom placed in the proper position to allow light to enter over the left shoulders of the pupils.
- (2) Wool work and mat plaiting (children's life sizes) in brilliant reds or neutral colours should be condemned. They are not allowed in many up-to-date schools. As an excuse the teachers say that the vivid scarlets are the colours that generally get the greatest credit from Inspectors. There is a sufficient range of other more suitable colours.
- (3) I found several schools using pale ink that in course of time turned black.
- (4) The new edition of the Bible should not be allowed inside a child's school. Its "pearl" type is unsuited to elder or younger children. The rubrics of the Book of Common Prayer and the print of the Hymn Books are also much too small. Phillips' First School Atlas (new edition), with its small and fine print, wealth of detail, and vivid colouring, should be condemned for children's use.
- (5) Platforms in school should be either cemented, and have suitable desks and seats fixed on them, or they might be made for infants' object classes with a skeleton frame to allow the interior to be easily cleaned. The floors, etc., of this platform would require to be boarded up, only the supporting pillars being skeleton, and they would require protection rails.

T. McDERMOTT, Major, R. A. M. C.,  
Ophthalmic Specialist, Eastern Command.

LUCKNOW;  
The 10th May 1907.

#### Additional Note—Lighting—

To obviate going into unnecessary detail, I have omitted reference to improvements required for each school. The application of the recommendations noted on page 42 will produce a great improvement, and in my opinion will raise the lighting of the schools concerned to a standard greatly superior to that of most of the best civilian schools in this country.

T. McDERMOTT,  
Major, R. A. M. C.

TABLE I.

Analysis of Sex of children over 7 examined in Army Schools, Eastern Command (1907).

Station and School.	Males.	Females.	TOTAL.
Calcutta, Garrison School . . . . .	17	14	31
Bareilly, ditto . . . . .	4	4	8
Fyzabad ditto . . . . .	12	6	18
Lucknow { 1st Royal Dragoons . . . . .	13	13	26
{ 1st Battalion, Oxford Light Infantry . . . . .	1	1	2
{ 1st Battalion, Durham Light Infantry . . . . .	8	11	19
Meerut { 15th Lancers . . . . .	6	13	19
{ Royal Artillery . . . . .	1	1	2
{ 1st Battalion, Royal Irish Rifles . . . . .	24	17	41
GRAND TOTALS . . . . .	86	80	166

LUCKNOW;  
The 8th May 1907.

T. McDERMOTT, Major, R. A. M. C.



STATIONS.	Total number examined.	Hyperostepha.	Hyperostepha with Squid.	Hyperostepha with Leucoma.	Hyperostepha Adsignatum.	Myopla.	Myopla Adsignatum.	Mixed Adsignatum.	Leucoma.	Aplousa.	Disrupt Strabomus.	Trachoma.	Total Defects of Vision.	REMARKS.
Calcutta . . .	31	2	1	1	1	...	1	1	...	...	...	1	8	
Bareilly . . .	8	1	*†	...	...	...	...	...	...	...	...	2	4	* Trachoma.
Syrabad . . .	18	2	1	...	1	...	1	...	†	...	...	...	6	† Anomometropia (dys M. & L. Mus.) and Squid.
Lucknow . . .	47	26	15	1	...	1	...	...	...	1	...	2	15	2 : Trachoma.
Meerut . . .	62	52	12	1	...	1	...	...	1	...	1	1	9	† : Follicular Conjunctivitis. † Trachoma 1 Leucoma.
GRAND TOTALS	166	13	10	3	2	2	2	1	2	1	1	6	43	

		Due to								
Squints (11)	{	Internal	{	Hypermetropia	.	.	.	.	.	8
			{	Leucoma	.	.	.	.	.	2
			{	Aphakia	.	.	.	.	.	1
		External	Hypermetropia	.	.	.	.	.	2	

T. McDERMOTT, Major, R.A.M.C.

TABLE III.





TABLE III A.

Additional Roll of children over 7 years suffering from Trachoma only.

STATION.	Corps of Father.	Child's name.	Sex.	Age.	Disease or defects.	Recommendation to remedy same.	REMARKS.
Calcutta . . . . .	Royal Engineers	Vandhye, Frederick	M.	13	Trachoma . . . . .	Any of 10% is distilled water three daily instilled into eyes. To be followed after the disappearance of the granulations by mild massage.	Family History. It seems to be prevalent among the poorer people of this city.
Bareilly . . . . .	1st Battalion, Royal Scots Fusiliers.	Martin, Marcell	F.	7	None		

LUCENOW;  
The 10th May 1907.T. McDERMOTT, Major, R.A.M.C.,  
Specialist in Ophthalmology, Eastern Command.

51

## NOTES ON

*Report on the vision of school children, lighting of schools, desks, etc., at certain stations, Eastern Command.*

Stations visited.—Calcutta, Bareilly, Fyzabad, Lucknow and Meerut.

## Vision of children.—

Number of children seen . . . . . 166  
 Number with defective vision . . . . . 43 (25%)

**Lighting of Schools.**—The lighting of every school inspected was found to be defective. The proportion of glass to floor area varied from 1·7 to 1·21 (that of the London schools is usually 1·6).

Schools classed as follows as regards lighting:—

1. Very bad.—(1) Calcutta, adults and elder children's school.  
 (2) Fyzabad, ditto.  
 (3) Meerut, Infantry Infants' school.
2. Bad.—Lucknow, Cavalry schools.
3. Indifferent.—All other schools visited.

Major McDermott is of opinion that the three schools classed above as "very bad" should be condemned.

Brief details regarding the lighting of the other schools and how it can be improved are entered into (cost of alterations not given).

Special attention is drawn to *Royal Artillery School at Lucknow*; the present school has been condemned and is to be replaced by a new school, and it is remarked that "this new school is not well lighted"; defects in the type-plan of the new school are detailed, but it is not stated whether it has been built.

The Plan of the new school does not appear to be of the latest pattern; if, however, it is the latest, some alterations appear to be necessary in the Standard Plan of schools.

On page 40 of the *Report* details are given as to how the lighting of all the schools can be improved at small cost.

**School Furniture.**—The old type of desks and seats are considered unsatisfactory for children.

The provision of a fixed seat and desk for each child, or of adjustable desks is advised.

On page 41 the requirements (measurements, etc.) of desks are given.

If single desks and seats are not provided, the adoption of Captain Flannery's combined desk and seat is recommended. Brief details of this combined desk and seat are given on page 41, but they are not full enough to allow of an opinion being given as to its suitability.

Desks for Infants are not dealt with separately.

**Additional remarks** are made on pages 41 and 42 regarding:—

1. Faulty position of desks with regard to light.
2. The use of brilliant red wool.
3. The use of pale ink.
4. The small type of the Bible and Prayer books.
5. Platforms.

T. W. GIBBARD.

The 23rd May 1907.

I enclose for your information a report by Major McDermott, R. A. M. C., Specialist in Ophthalmology on the eyesight of children and the lighting of schools, etc., at certain stations in the Meerut and Lucknow Divisions.

W. L. GUBBINS.

The 3rd June 1907.

Adjutant General's Division.

No. 167, dated Mount Abu, Rajputana, the 8th March 1907.  
 From—Major F. KIDDLE, R. A. M. C., Specialist in Ophthalmology, Western Command.  
 To—The Principal Medical Officer, 5th (Mhow) Division, Mhow.

SIR,

I have the honour to forward herewith my report of the inspection I have recently carried out with regard to the eyesight of the children of British soldiers at certain stations, in accordance with the orders contained in your No. 312, dated 19th January 1907, forwarding Principal Medical Officer, Western Command's No. 160-Medical, dated 16th January, 1907. The Report of Committee on Barracks, etc., is returned also.

I have the honour to be,  
 Sir,  
 Your most obedient servant,

F. KIDDLE, Major, R.A.M.C.,  
 Specialist in Ophthalmology, Western Command.

*Report on the condition of the eyesight of children of British soldiers at, the lighting of, and the type of desks and seats in, certain schools in the Western Command.*

Karachi, Mhow,  
 Ahmednagar,  
 Poona, Kirkee,  
 Colaba.

Nature of  
 tests.

Number of  
 errors found.  
 Schoolrooms.

Lighting.

Desks and  
 seats.

The schools in the marginally noted stations were visited. The vision of the children (those above seven years of age only) was first examined at the schoolroom, in the presence of the teacher, who afforded valuable information regarding the children where required.

The test carried out was by means of Snellen's test-types, each child being required to read D-6 at 20 feet, and D-0.5 at 10 inches. Any child who could not read the types under these conditions was (with the parents' consent) at once put under the influence of a mydriatic and the refractive error estimated.

The parents were then informed of the nature of the child's defect and what treatment was recommended. With but few exceptions the advice given was accepted, and prescriptions for glasses, where indicated, given.

The actual number of refractive errors discovered was small, the total being 21. This out of a total of 156 gives a percentage of 13.5.

Those at Karachi and Colaba are very good rooms for the purpose and require no structural alterations.

The rooms in use at Ahmednagar and the Cavalry Lines, Mhow, are quite unsuited for the purpose. They are very dark, ill-ventilated and I do not consider any structural alterations to be feasible so as to remedy the defects. This refers especially to Ahmednagar, where the room is an exceedingly bad one.

Structural alterations are feasible and would remedy present defects in the schoolrooms of Royal Horse Artillery School, Mhow, of Connaught Rangers at Ghorpuri (Poona) and the school at Kirkee; minor alterations will improve matters at the British Infantry school at Mhow.

The above recommendations will be found noted with the respective reports of each station.

This has been reported on for each station. It is satisfactory at Karachi, Colaba, British Infantry school, Mhow, and the Infantry school, Wanowrie (Poona). At the others it requires improving as noted in the recommendations made for each station respectively.

At each station desks of old patterns, and seats with no back-rests are in use. At my request the teachers made the children seat themselves in the usual way, as though for a lesson; it was then quite apparent that with few exceptions none of the children were properly seated. Some had their feet quite off the ground or could not reach the foot-rests, the latter being fixed in a faulty position. This caused them to support their weight partly on the left arm and partly on the chest, pressed against the edge of the desk.

In some instances this state of affairs was improved by having wooden blocks put under the ends of the seats, thus raising the body level to admit of more weight being supported on the left arm.

Some of the smaller children experienced great difficulty apparently in reaching the inkpots, owing to the width of the desks being too great. Advantage is taken where possible to obviate this as much as can be by placing the smaller children at those desks that are narrower, but this does not help much.

At Wanowrie there are a few adjustable seats, but these are only capable of being raised and not approximated to the desk itself where necessary. Recommendations.

The schoolrooms should be dealt with as referred to above, with the exception of those at Ahmednagar and Cavalry Lines, Mhow. These should be given up as schoolrooms altogether, especially the former.

If it is necessary that the adults' school at Kirkee be held at the same hours as the children's, the difficulty could be remedied to a great extent by partitioning off a portion of the room in a transverse direction. This, in conjunction with the proposed opening up of the walls between the verandah and the room itself, would give two fair-sized, airy and amply lighted rooms.

The desks, if newer patterns are not to be issued, can be improved considerably by having the foot-rests placed with their front edges on a level with a plumb-line dropped from the front edge of the desk itself; they should be broader than at present and should be quite horizontal. The majority require to be placed lower than at present, but if they could be made to slide up and down vertically, so as to be readily adaptable to the requirements at the time, a present objectionable feature would be removed.

Some desks should be made a little narrower to accommodate those children who find a difficulty in reaching the inkpots.

The seats at present are not suitable for alteration. The present state of affairs can only be improved by having a series of wooden blocks of different sizes supplied. These could be used to raise the seats to the proper height required.

I have not seen a plan of the proposed new adjustable seats with back-rests. If not already anticipated, I would recommend their seat pillars being made somewhat after the pattern of a cycle saddle pillar, i.e., bent at a right-angle. This would enable the seat to be adjusted horizontally as well as vertically, a matter of some importance, as some children naturally tend to sit closer to their desks than others. This will not encourage a faulty position, and will make the seat more comfortable.

Although not in the scope of the present inspection I was shown copies of the various text-books in use. The types are very good with the exception of that in the Bible, which is much too small.

F. KIDDLE, Major, R.A.M.C.,  
 Specialist in Ophthalmology, Western Command.

MOUNT ABU,  
 The 8th March 1907.

*Karachi. Inspected 15th February 1907.*

(a) The number of children examined was twenty. All had normal vision.

(b) *Lighting*—Was sufficient and good.

The walls, however, are white-washed, causing a great deal of glare, especially on bright days. This can be readily remedied by colouring the walls a light green.

(c) *Desks*—Are of old patterns. All have foot-rests, but these, on account of their positions are either impossible to use at all, or cause the children using them to take very faulty attitudes.

This can be corrected almost completely by altering the positions of the rests and would admit of the desks being used for children of ten years old and upwards only; they are too wide for smaller children as the inkpots cannot be reached except with difficulty.

(d) *Seats*—Are ordinary forms without back-rests. Some are raised on blocks to enable the children to use the desks. This in many instances causes the feet to be quite off the ground, the child consequently balancing by leaning on the desk entirely, as the foot-rests cannot be reached.



*Recommendations.*

Walls should be coloured a light green.

Desks should have foot-rests fixed lower than at present and nearer to a plumb-line dropped from the front edge of desk if long desks are to be retained, they should be of varying proportions to suit different children.

Seats should be adaptable; the system of raising the forms on blocks is at the best but an ineffectual method of correcting present defects.

Mhow. Inspected 19th February 1907.

(a) The number of children examined was twenty out of which number three were found to be the subject of refractive errors. The remaining seventeen were normal.

(b) The following table shows the particulars of those with defective vision—

Station.	Corps of father.	Child's name.	Sex.	Age.	Disease or defect.	Recommendation to remedy same.	REMARKS.
Mhow.	E. Surrey Regiment.	Artemus Ward.	M.	15½	194 (C) Astigmatism hypermetropic, simple.	Glasses to be worn constantly.	Vide below.
Do.	Do.	Percy Ward.	M.	8½	194 (C) Astigmatism hypermetropic, compound.	Do.	Do.
Do.	Carabinieri.	Stanley Coates.	M.	7½	194 (C) Astigmatism myopic, compound.	Do.	Do.

*Remarks.*—In none of these three cases did the parents desire to have glasses for their children, advancing the reason that the cost was too great. They were informed that the prescription for glasses could be obtained from me at any time. They said they would consider the matter.

There are three schools in Mhow, viz.:—R.H.A., British Infantry, and British Cavalry.

*R. H. A. School.*—

*Lighting.*—Very defective due to deep verandahs.

*Desks.*—Of old patterns as at Karachi. The slope of some is excessive.

*Seats.*—Are ordinary forms, many being raised on blocks to accommodate different aged scholars.

*Recommendations.*

Lighting can be improved by having glass panels put in doors, and larger windows both sides could be made.

Desks and seats should be dealt with as recommended in the case of Karachi.

*British Infantry School.*—

*Lighting.*—Satisfactory, but can be improved by having panels of glass let into the doors.

*Desks.*—The same remarks apply here as regards Karachi, the defects noted being similar. Complaint was made that the strip of wood along the front edge was objectionable as it hurt the scholar's arm; this, however, need not be entertained as it will be remedied when the seats and desks are corrected.

*Seats.*—As at Karachi these were of old pattern. A few had blocks to raise them, but many had no facilities for raising them.

*Recommendations.*

Walls should be coloured a light green or yellow.

Desks and seats require the same alterations as required in the case of those at Karachi.

*British Cavalry School.*—

*Lighting.*—Very bad; walls coloured wrongly.

*Desks and seats.*—All of old pattern and unsuitable.

*Recommendations.*

This is a very unsuitable room for the purpose and one that cannot be much improved structurally. If it must be retained as such, panels should be put in the doors and large semi-circular windows constructed above them.

Desks and seats require similar alterations as in the cases referred to above. A supply of blocks of various thicknesses would improve the seats as a temporary measure.

Ahmednagar. Inspected 21st February 1907.

(a) The number of children examined was seven. Of this number 1 was found suffering from a refractive error.

(b) *Lighting.*—Very defective due to deep and low verandahs, and a chupper extension on the western side. The walls are coloured white and dark grey. There are a few top lights but they are practically useless.

Ventilation is deficient and cannot be improved owing to there being a quarter on each side.

(c) *Desks.*—All of old pattern with the same objectionable features as in those at Karachi.

(d) *Seats.*—Ordinary forms; nearly all are too low and none have back rests.

The following are the particulars of the case of refractive error:—

Station.	Corps of father.	Child's name.	Sex.	Age.	Disease or defect.	Recommendation to remedy same.	REMARKS.
Ahmednagar.	Royal Artillery.	Ruby Clarke.	F.	12½	194 (C) Astigmatism myopic, compound.	Glasses should be worn constantly.	Vide below.

*Remarks.*—A prescription was given to the parents, who were advised regarding the nature of the child's defect.

*Recommendations.*

This is a very unsuitable building for a school, being dark, badly ventilated and small. As an adults' school it is much too small; for this reason the chupper extension has been recently erected.

I do not think any structural alterations feasible or possible and consider it desirable to remove the school to another building. Desks and seats should be dealt with as recommended in the remarks under that heading regarding Karachi.

Poona (Ghorpuri). Inspected 22nd February 1907.

(a) The number of children examined was thirteen of whom two had refractive errors, the remaining eleven being normal.

(b) The following table shows the particulars of those with defective vision:—

Station.	Corps of father.	Child's name.	Sex.	Age.	Disease or defect.	Recommendation to remedy same.	REMARKS.
Poona (Ghorpari).	Connaught Rangers.	Michael Smith.	M.	7½	194 (B) Hypermetropia.	Glasses not required at present.	Error of sight nature.
Ditto.	Ditto.	Arthur Dickerson.	M.	11	194 (C) Astigmatism, mixed.	Glasses should be worn constantly.	Advice not accepted.

(c) *Lighting*—Would be sufficient were it not that there is a raised "platform"—14½ inches high—extending the whole length of the room and about a third of the width across. This necessitates some of the desks being much higher than others and as a consequence a great deal of light is blocked off.

In the afternoon a great deal of glare is complained of.

(d) *Desks*—There are four of an adjustable pattern as far as the seats are concerned, and the latter are fixed to the desks. But they have no back-rests. The other desks are of old pattern, with the same objections as in those at Karachi.

(e) *Seats*—Are ordinary forms, with the exception of those referred to in paragraph (d).

#### Recommendations.

Lighting should be improved by having the "platform" referred to in paragraph (c) removed. This will enable all the children to be seated on the same floor level and so avoid the present obstruction of the light. Extra "jumps" on the western side will modify the afternoon glare to a great extent.

The walls should be coloured a pale-green instead of the present white colour.

Desks and seats require the same alterations as in the case of those at Karachi.

Poona (Wanowrie). Inspected 23rd February 1907.

(a) The number of children examined was nineteen, of whom four were found to have refractive errors; the remaining fifteen being normal.

(b) The following table shows the particulars of the four defective cases:—

Station.	Corps of father.	Child's name.	Sex.	Age.	Disease or defect.	Recommendation to remedy same.	REMARKS.
Poona (Wanowrie).	Mounted Infantry School.	Eileen Cowton.	F.	12	194 (B) Hypermetropia.	Glasses for reading.	Advice accepted.
Ditto.	E. Lancs. Regt.	Blanche Haigh.	F.	8½	194 (B) Hypermetropia.	Glasses to be worn constantly.	Advice accepted.
Ditto.	Ditto.	Lilian Naylor.	F.	8½	194 (C) Astigmatism, hypermetropic, compound.	Glasses to be worn constantly.	Advice accepted.
Ditto.	Ditto.	Ada Cartmell.	F.	8½	194 (C) Astigmatism, myopic, compound.	Glasses to be worn constantly.	vide below.

The mother of Ada Cartmell attended to hear my opinion of her child's vision. I had some difficulty in obtaining her consent to a full examination, and on completing it she said she would see how the child progressed before getting glasses. The case is an advanced one.

(c) *Lighting*—Adequate. The walls were of a white colour.

(d) *Desks*—All old pattern except four, which are of later date with adjustable seats. But these only admit of the seats being raised and not placed nearer the desks themselves. Consequently, a very stooping attitude is necessary on the child's part to enable it to reach the desk.

The other desks have all the same objectionable features as in the case at Karachi.

(e) *Seats*—Ordinary forms without back-rests, except those referred to in paragraph (d).

#### Recommendations.

Walls should be coloured a pale-yellow or green, otherwise no alteration in the lighting is required.

Desks and seats should be changed for those of more recent pattern.

Kirkee.—Inspected 23th February 1907.

(a) The number of children examined was forty-nine of whom four were found to be the subjects of refractive errors, the remaining forty-five being normal.

(b) The following are the particulars of those with refractive errors:—

Station.	Corps of father.	Child's name.	Sex.	Age.	Disease or defect.	Recommendation to remedy same.	REMARKS.
Kirkee.	R. F. A. Riding-master.	Nelly Taylor.	F.	13½	194 (C) Astigmatism, hypermetropic, simple.	Glasses to be worn for reading.	Advice accepted.
Ditto.	R. F. A. Riding-master, 2nd. Batt.	Herbert Kettlebrand.	M.	10½	194 (C) Astigmatism mixed.	Glasses to be worn constantly.	Advice accepted.
Ditto.	Military Accts.	Elizabeth Laskey.	F.	8½	194 (B) Astigmatism, hypermetropic, compound.	Glasses to be worn constantly.	Advice accepted.
Ditto.	Ditto.	Josephine Laskey.	F.	10½	???	?	Not brought for further examination.

*Lighting*—Is defective on account of the room being inside a closed verandah. Walls are whitewashed which improves matter a little.

*Desks and seats*—Are of old patterns; these cannot be adapted but matters would be improved by some blocks being provided to raise the latter.

An objectionable feature is that there is a large class of men being held simultaneously in the closed-in verandah referred to. Should the recommendations given below be adopted the two classes would be practically in the same room.



## Recommendations.

**Lighting.**—Can be improved by having larger clerestory windows made; the walls between the verandah and room itself should be opened up at intervals along its entire length and the arches over the doors also.

Chicks are required on the south-east side to modify the glare.

The walls require to be coloured a pale-green should the alterations suggested be carried out.

**Desks and seats** require the same changes as recommended in the case of Karachi.

The schoolmaster complained that the type of which the HOLY BIBLE if printed is very difficult for the children to read easily. I examined a copy and consider it much too small; and the issue should therefore be withdrawn and one with larger type substituted.

## Bombay (Colaba).—Inspected 26th February 1907.

(a) The number of children examined was twenty-eight of whom seven were found to be the subject of refractive errors, twenty-one being normal.

(b) The following table shows the particulars of those with errors:—

Station.	Corps of father.	Child's name.	Sex.	Age.	Disease or defect.	Recommendation to remedy same.	REMARKS.
Colaba	Ordnance Department.	Grace Fitzpatrick.	F.	8½	194 (B) Hypermetropia.	Glasses should be worn constantly.	Advice accepted.
Ditto	Ditto	Mona Feuring	F.	16½	194 (c 7) Astigmatism, myopic, compound.	Stronger glasses should be used in lieu of present ones.	Ditto.
Ditto	Ditto	Harry Feuring	M.	15½	194 (c 7) Astigmatism, mixed.	Glasses to be worn constantly.	Ditto.
Ditto	Ditto	Horace Feuring.	M.	8½	194 (B) Hypermetropia.	Ditto	Ditto.
Ditto	Royal Scots Royal Regt.	Christina Brown.	F.	7	194 (B) Hypermetropia.	Ditto	Ditto.
Ditto	Ditto	Robert Brown	M.	10½	194 (c 7) Astigmatism, hypermetropic, compound.	Ditto	Ditto.
Ditto	Royal Garrison Artillery, 62 Company.	Norman McKay.	M.	10½	194 (B) Hypermetropia.	Ditto	Ditto.

Prescriptions were given to the parents of each child concerned, and the nature of the disability explained.

The schoolrooms are very good ones.

**Lighting.**—Is ample and sufficient. The walls are of a medium yellow tint, which requires no alteration.

**Desks.**—Are of old pattern with no support for the feet of the smaller children. Some, however, are suitable and all can be adapted.

**Seats.**—Are the usual forms.

The Infants' school is quite up to date and requires nothing altered.

No. 1106-Medical.  
Head-Quarters, 5th Division, Medical.  
Mhow, 12th March 1907.

The Principal Medical Officer, Western Command.  
Forwarded.

J. F. WILLIAMSON,  
Colonel, R.A.M.C.  
Principal Medical Officer,  
for G. O. C. 5th Division.

No. 974-Medical, dated Poona, the 20th March 1907.

To—The Principal Medical Officer, His Majesty's Forces in India, Simla.

Memorandum,

Forwarded.

2. The physical deformities and life-long suffering that may result from the conditions existing in the schools render it most important that immediate steps should be taken to have all schools fitted with comfortable seats, proper lighting and good ventilation.

3. The attendance of the schools being compulsory there can be no question as to the moral obligation to render the buildings suitable to the purpose for which they are used.

F. W. TREVOR, M.B.,  
Surgeon-General, A.M.S.,  
For General Commanding, Western Command.

No. 1079-Medical.  
Head-Quarters, Western Command.  
Poona, the 28th March 1907.

From—GENERAL SIR A. HUNTER, K. C. B., D. S. O., Commanding Western Command,

To—The Principal Medical Officer, His Majesty's Forces in India, Simla.

In continuation of my No. 974-Medical, dated 20th March 1907, I have the honour to submit a Note by Major F. Kiddle, R. A. M. C., regarding the number of school children he examined during his recent inspection:—

"The numbers of children brought to me were small, so much so, that I commented on it at the time, but the school masters at each station assured me that those produced were all that were on the roll. It should be remembered that only children of 7 years and upwards were examined and this of course reduced the numbers greatly.

My arrival was noted in Orders each time too, so that as far as I could find out each time every available child was brought up."

I have the honour to be,

Sir,

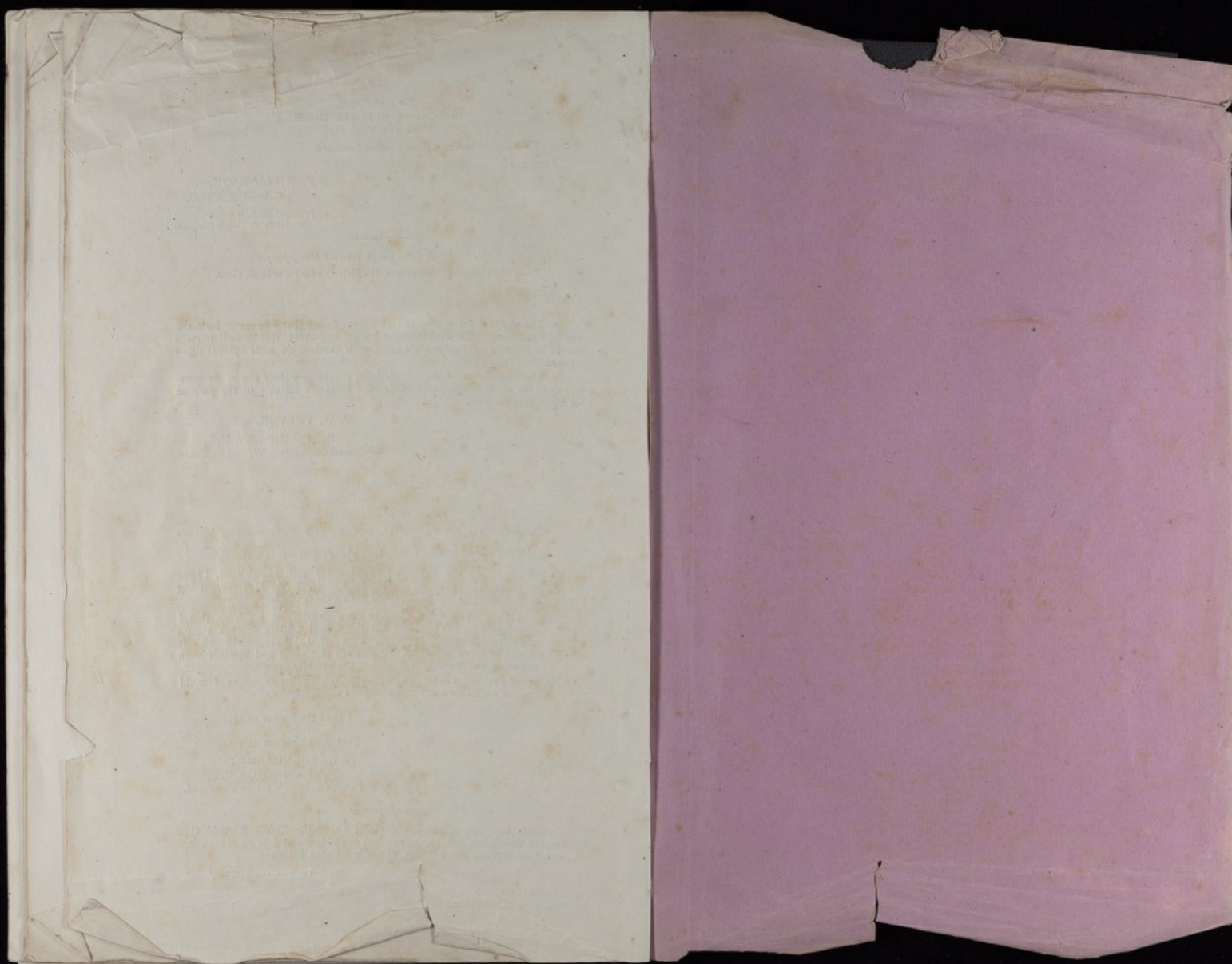
Your most obedient servant,

F. W. FREVOR, M.B.,  
Surgeon-General, A.M.S.,  
For General Commanding, Western Command.

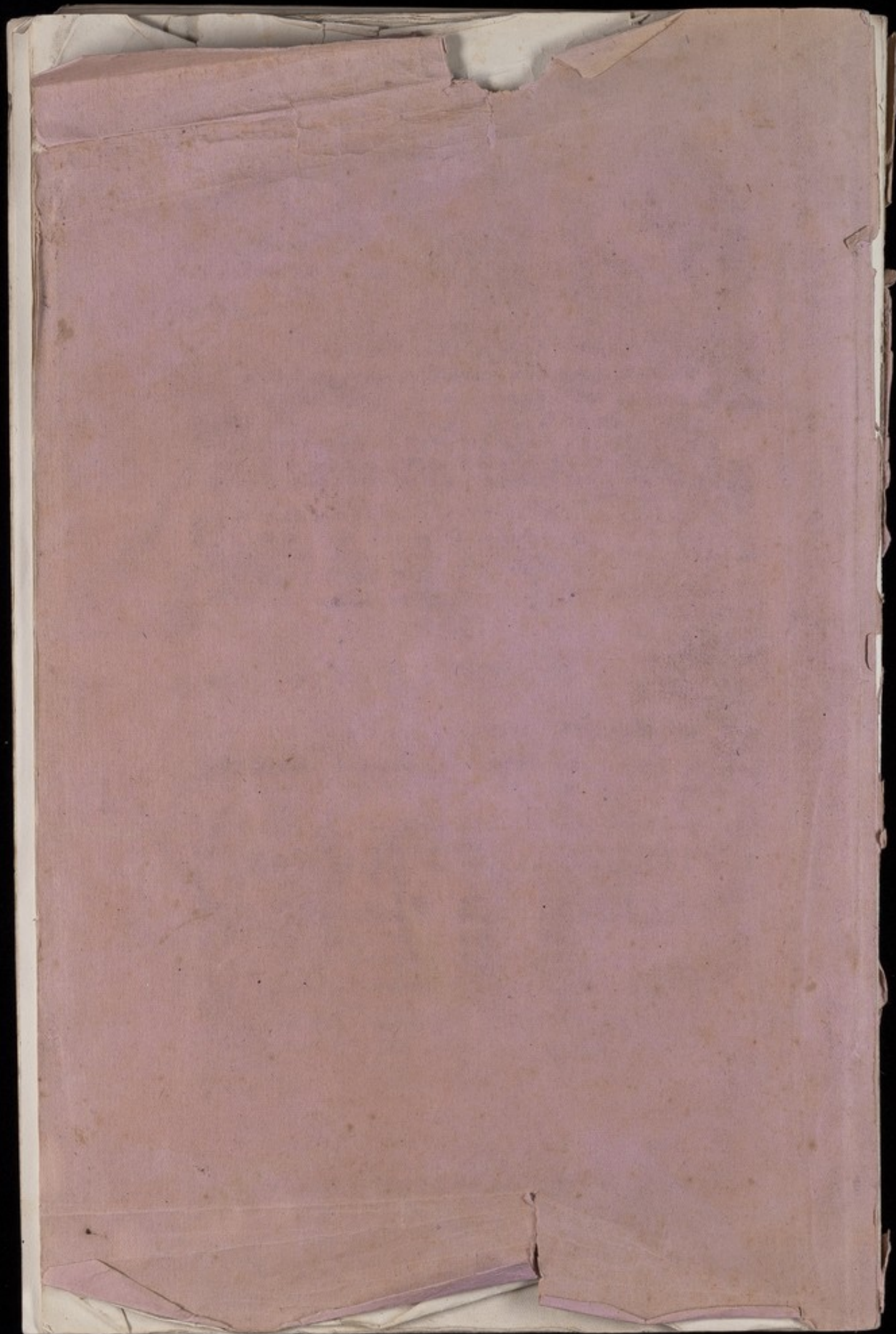
I enclose for your information a report by Major Kiddle, R. A. M. C., Specialist in Ophthalmology, on the eyesight of children and lighting of schools, etc., at certain stations in the Quetta, Mhow and Poona Divisions.

W. L. GUBBINS.

The 3rd June 1907.  
Adjutant General's Division.









RANC 1212 / 1

# The Bloemfontein Post.

JUNE 1st, 1962.

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## SPECIAL.

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# PEACE

Officially Declared.

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DETAILS LATER.



RAMC 1212

Lt/Col. N.B. KNOCKER.

Recd  
ack  
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WJ.

D.F. M.B.C. School.

Wendbamsse Quenon.

Rahis.

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ماہنامہ ہفت روزہ

سول اینڈ سٹریٹ گزٹ پورٹل

مطالعہ

تیار کی ہے

رائل میٹیکل کورس

پراپرٹیز کی پیمائش

افسروں و فنانس کی فہرست

نیا کتاب

نیا کتاب اور شعریں



## دیاچہ

ان مضامین کو ہم ایک دفعہ پچھلے بطور  
لیکچر نر کھٹنڈ افسران و چیدا پیاوٹ  
کوٹمین و جمنٹ دستہ اول کو سنایا گیا  
دوبارہ کتاب کی صورت میں پفرائش کرنیل  
پنیک صاحب بھادر سی۔ ایم۔ جی۔ دی  
امیس۔ او۔ کماٹڈ افسر جمنٹ ندکور چھاپی  
گئی۔ تاکہ کرنیل صاحب ہر ایک افسر و نر  
کھٹنڈ افسر کو ملاحظہ کیلئے دیکھیں۔

اس کتاب کو کئی ایک دوسری  
انگریزی رجمنٹ نے مفید اور کارآمد سمجھا  
ہے۔ اور بفرائش کرنیل پٹیک صاحب  
بہادر اور دیگر افسران ویسی رجمنٹ ونکی  
آرڈر میں چھاپی جاتی ہے۔ تاکہ ہر ایک ویسی  
سپاہی اس سے مستفید ہو سکے  
میں لفٹنٹ کرنیل کو لو منب صاحب  
نمبر رجمنٹ گورکھا ایل کا شکریہ ادا کرتا  
ہوں۔ جنہوں نے مجھے اس کتاب کے  
بنانے میں جو ویسی فوج کو واسطے مفید  
از حد مجبور کیا ہے میں نے حتمی المقدور ان  
مضامین کو سادہ سے الفاظ میں بیان

کرنے کی کوشش کی ہے۔ تاکہ ہر ایک  
سمجھ سکے۔ کہ صفائی کیٹون اور کس طرح  
صحت کے لئے ضروری ہے۔

تخت

بی۔ ٹی۔ ڈبلیو۔ ڈی

راولپنڈی

۱۹۰۷ء



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ہدایات و بارہ صفائی خمیہ اور بارکولین  
 برائے نسران و نان کشتہ نسران  
 باب اول - صفائی کی ضرورت پر ریمارکس۔

اس امر کی ضرورت کہ نسران اور ہر ایک آدمی  
 کو صفائی کی احتیاط کرنی چاہئے۔ ہم ذیل کی مثال سے  
 ثابت کریں گے جو چھ مہینے کپتان جی جیو سٹونی - آچر  
 ایم سی کے لیکچر سے جو ادھون نے صحت انسانی پر  
 نقل کرتے ہیں - ہمیں یہ ثابت کیا گیا ہے کہ فی ہزار  
 دسویں جو فیج میں موجود تھی - ذیل کی تعداد ہسپتال میں داخل ہوئی

بخشی دیگر	بیار	
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اس تعداد سے صاف طور پر ثابت ہو جائیگا کہ زخم خوردہ اور دیگر اشخاص کی تعداد میں کتنی تفاوت ہے۔ یعنی بیاروں کی تعداد زخم خوردہ سے بدرجہا زیادہ ہے۔ اگر صرف چین کی لڑائی کو لیا جاوے تو فی ہزار آدمیوں کے لڑائی میں گئے ایک ہزار اکیاون بیمار ہو کر ہسپتال میں داخل ہوئے۔ اور صرف ۱۵ مجروح۔ جنگ نیل میں دیکھا جاوے تو ۸۰۸ بیمار اور صرف ۲۲ مجروح۔ جس سے ہم تخمینہ

فیصدی کا نکال سکتے ہیں۔ اور علیٰ ہذا القیاس دیگر جنگوں کا۔ ہماری تازی جنگ جنوبی افریقہ میں ۴۵۰۰۰۰ چار لاکھ پچاس ہزار آدمی میڈیکل ڈیپارٹمنٹ میں علاج کیا وسط داخل ہوئے جس میں سے صرف بائیس ہزار صرف زخم خوردہ تھے۔ یہ امر قابل غور ہے کہ چار لاکھ پچاس ہزار سپاہ صرف بیماری کا شکار ہوئی۔ اور نہ دشمن کی گولی کے۔ یا یوں کہا جاوے کہ ہر ایک زخم خوردہ کے مقابلہ میں سبب بیماری سے لاپارہے ہند ہر ایک فسر اس بات پر متفق ہوگا کہ سپاہیوں کو بیماری سے بچنے کا طریقہ سکھایا جانا ضروری ہے ہر ایک کو یہ تعداد روشن ہونی چاہئے۔ اور یہ یہی کہ جنوبی افریقہ کی لڑائی میں چوتھ ہزار گس صرف تب تھوڑے اور مردوں کا شکار ہو کر ہسپتال میں داخل ہوئے



جس میں سے نو ہزار مر گئے اور یہ مرنا نہ اہل دل  
کی طرح میان جنگ کرتا۔ بلکہ ایسی بیماری رکھ سکتی تھی  
اگر کسی کو ان بیماریوں کے قابل شک ہو تو  
وہ ذیل کا مضمون جو ہم (سیرنگا کی) ایف آ  
سی۔ ایس انگلستان و۔ ڈی۔ سی۔ یل بی ڈیٹر  
جنرل شاہی سیرا۔ جاپان سے نقل کرتے ہیں۔  
اپنی تشفی کر لیں۔ ترقی جو جاپانی فوج نے اپنی  
صحت کے قائم رکھنے میں چین اور جاپان کی  
لڑائی میں حاصل کی اسپریریند کو رتھ کر کے ہیں۔  
+ (چین اور جاپان۔ اور روس اور جاپا  
کے زمانہ حال کی لڑائیوں کو مقابلہ کرنے سے  
ہمو ذیل کا نتیجہ حاصل ہوتا ہے۔  
نمبر اول۔ ہیضہ بالکل معدوم۔

نمبر (2) نپ معرقہ کے واقعات فی ہزار  
37.14 + سے 26.0 تک کم ہو گئی  
(3) مرڈون کے واقعات 108.6 سے  
10.52 تک کم ہو گئی۔ (4) موسمی بخار  
کے واقعات فی ہزار 102.5 سے 10.96  
تک کم ہو گئی۔ یہ قابل غور عمدہ نتائج اس ترقی  
پر مبنی ہیں جو خوراک لباس اور زمین خمیہ کی  
چیدگی میں احتیاط ملحوظ خاطر رکھی گئی تھی۔  
اور ہمنے بالخصوص بکھیون کو معدوم کر دینے میں  
کوئی دقیقہ فرگذاشت نہ رکھا۔ اور اون کو  
گہروں میں آنے اور کھانے کی چیزوں پر بیٹھنے  
سے روکا۔ وروا زون اور گہر کیوں پر پردہ معلق  
کر دئے گئے تھے۔ تاکہ کہیاں داخل نہ ہو سکیں

اور نیز جسم کی ننگی حصہ - مثلاً چہرہ وغیرہ کہیوں  
سے محفوظ کر دئے گئے ہتے - اور دمل کے  
پر دے کہیوں اور چہروں سے بچنے کے لئے  
عام طور پر استعمال کئے گئے - اور صفائی کی حقیقت  
سے علاوہ صفائی کے بڑھنے کے تپ محرقہ  
مروروں - اور موسمی نیجار کے واقعات بہت  
کم ہوئے +

اس مضمون پر وقت میں تاویب ہونی  
ایک اشد ضروری ہے - بلکہ اسکو کہنی تعلیم کا  
ایک حصہ سمجھنا چاہئے - ہر ایک فرد بشر کو  
یہ امر میں نشین کر دینا چاہئے کہ یہ تعلیم  
کیوں ضروری سمجھی گئی ہے - کیونکہ جب تک وہ  
اسکی ماہیت سے ہر پہلو پر واقف نہ ہوئے -

تو اگر وہ صفائی کی خوبی سمجھنا اور اس پر مقبول  
طور پر عمل کرنا ناممکن ہے -

### باب دوم + پانی +

ایسی کچھ چند ان ضرورت معلوم نہیں ہوتی  
کہ اس امر کو مثالوں سے ثابت کیا جاوے کہ  
پانی بیماریوں کا باعث ہے - جو بیماریاں پانی کے  
ذریعہ پھیل جاسکتی ہیں - وہ یہ ہیں -  
تپ محرقہ - یعنی انشڑک فیور - ہیضہ و مرور -  
یہ ہر ایک سپاہی کو جانتا چاہئے کہ بیماریوں  
کے کرم - انکے مریضوں کے پاخانوں میں ہوتے  
ہیں - اگر ان کرموں میں سے کچھ پینے والے  
پانی میں داخل ہوں - اور وہ پانی پیاجاوے



تو اغلباً پینے والا بیمار ہو جاویگا۔

(کڑواہٹ) میں جو تپ محرقہ کا دباء پہلیا۔ وہ اس  
سبب تھا۔ کہ ایک مزدور بیمار ایک پینے والے  
پانی کے کوٹین کے پاس جو واٹر کمپنی کے تعلق  
میں تھا۔ رفاع حاجت کیا۔ بعد ازاں جو کوئی اس  
کوٹین سے پانی پیتا وہ تپ کا شکار ہو جاتا۔  
اور جن اشخاص نے دوسرے کوٹین کا پانی  
استعمال کیا۔ وہ بیماری سے بچ گیا۔

مزدور یعنی (ہوپ پیکرز) جو تپ محرقہ سے  
بیمار تھے۔ وہ اسی زمین پر پاخانہ کرنے کے لئے  
گئے جہاں سے (میڈسٹون) کے لئے  
پانی لیجا یا جاتا تھا۔ اس سے پانی بیماری کے کرم  
سے مخلوط ہو کر نذرینہ نالی (میڈسٹون) میں پڑا۔

تو فوراً یہ بیماری شروع ہو گئی۔ اور اسی طرح سے  
کئی ایک مثالیں اسی دباؤن کی ہو سکتی ہیں۔  
جس سے صرف ایک نقطہ یاد رکھنے والا یہ ہے  
کہ بیماری کا سبب کرم پانی میں مخلوط ہو جاتا تھا۔ اور  
بالخصوص یہ یاد رکھئے کہ آدمی جو قدرے اس بیماری  
میں گرفتار ہے۔ وہ اپنے کام میں لگے رہے  
اس سے بھی بیماری کو پہلنے کی تقویت ہوئی۔  
اگر یہ اشخاص جو بیماری میں گرفتار تھے ہسپتال  
میں داخل ہو جاتے۔ اور انکی بول بیرا خاص طور  
پر نابود کئے جاتے۔ تو بیماری کا ہونا ممکن تھا۔  
میں زیادہ تر اسپرائلے زور دیتا ہوں۔ کہ عمومی  
فوج میں وقوعہ تپ محرقہ اسوجہ سے ہوتے ہیں  
کہ یہاں جو اس بیماری میں مبتلا ہو جاتے ہیں

وہ اس بارک یا خیمہ میں رہتے ہیں جس میں اسکا  
آغاز ہوا۔ اور اسی ایک پاخانہ کو استعمال کرتے  
ہیں جس میں تندرست آدمی جاتے ہیں۔ اس سے  
غالباً پاخانہ وغیرہ جس میں کرم مخلوط ہوتے ہیں۔ اپنی  
بارکون یا خیموں کے باہر ہی کرتے ہیں۔ اس ضرورت  
کو ہم کافی لفظوں میں بیان نہیں کرتے کہ وہ کون  
جو اس بیماری میں مبتلا ہو جاتے ہیں۔ انکا فرض ہے  
کہ اپنی حالت کی خبر فوراً دیں۔

ہضمہ کے بہت سے وقوعات ہیں  
پینے والے پانی کے سبب ہی ثابت ہوئے  
ہیں۔ تب لہزہ کی طرح ہضمہ کے کرم ہی مرض  
کے اخراج میدہ سے وابستہ ہیں۔ اگر ان طرح  
یا رقبوں کے کرم پانی میں ملجا دیں۔ تو ایک بار

شروع ہو جاتی ہے۔

مثلاً ہم یہ بات اس طرح ثابت کرینگے۔  
کہ ہندوستان میں اس و باد کا شروع ہونا ایک  
دسی ہضمہ کے مریض کا دریا کے کنارہ پر  
رہنے (کرناتھا) کرم پانی میں مل گئے۔ اور  
عرصہ بعد ہستی نے اپنی مشک اس پانی سے  
بہری جس میں مریض کے قے کے کرم مل چکے تھے  
نتیجہ یہ ہوا۔ کہ جس شخص نے اس مشک سے  
پانی پیا۔ وہ ہضمہ میں مبتلا ہو گیا۔ طرفہ ہرین  
یہ کہ مشک خود ہی اسی کرم سے مخلوط ہو کر  
د بال ہو گئی۔ کرم اس کے اندر کی طرف چپٹی رہی۔  
اور جب تک اسکو اچھی طرح سے دھویا نہ جاتا جو  
پانی اس میں پڑتا۔ وہی بیماریوں کے پھیلنے کا باعث



ہو جاتا تھا۔ لکھنؤ میں جو انگریزی فوج میں سفید  
پہیلا۔ جسمیں 600 چھ صد بیمار ہیں 90  
اسکا باعث یہ تھا کہ فلٹر میں جو ریت ڈالی  
گئی وہ دریا کے ایک ایسے مقام سے لائی  
گئی تھی جہاں ہفتہ کے مریض غسل کیا کرتے  
تھے۔

یہ کافی طور پر ثابت کر دیا گیا ہے کہ  
بیماری کا زیادہ تر انحصار بعض وقت پانی  
پر ہوتا ہے۔ صرف ہفتہ یا تپ لرزہ کے  
بیمار کا پاخانہ یا پیشاب پانی میں مخلوط ہونا  
ہی کافی ہے۔ جو اُس پانی کے لینے والوں  
کو بیمار کر دیوے۔ لہذا یہ ضروری ہے کہ  
پانی کی خصوصاً احتیاط کی جاوے۔ اور نیز اُس

زمین میں جہاں یہ جمع ہوتا ہو۔ اسی گاؤں  
کے خس خاشاک سے دور اس کے گرد ملک  
کرنے اور حیوان اور انسان اس کے قریب جانے  
سے منع کر کے بچایا جاوے۔ اور ٹھوس  
چشمہ جسے پانی پینے کی واسطے لیا جاوے اسکی  
اس قدر حفاظت کی جاوے۔ کہ آئینہ میلا پانی  
داخل نہ کر سکے۔ اور نیز اُن چشموں کو جس سے  
پینے کا پانی لیا جاوے۔ محفوظ رکھنا چاہئے  
اس بات کا بالخصوص لحاظ رکھنا چاہئے کہ  
کوئین جس سے اس ملک میں پانی پینے  
کیلئے نکالا جاتا ہے۔ انہیں پانی کس طرح جمع  
ہوتا ہے۔ مینہ جب زمین پر پڑتا ہے۔ تو  
ریتیلی زمین سے چونکہ ایک ایسی تہ پر پہنچ جاتا

جہاں مٹی کی رکاوٹ آگے گزرنے نہیں دیتی۔ اگر کنواں کہو داجاؤ۔ تو پانی پتیا نہیں ہوتا۔ تا وقتیکہ اس مٹی کی جذبہ پونج جاو اس سے یہ بخوبی معلوم ہو جاوگا۔ کہ اگر اسی زمین میں میلہ سرعت کرے۔ تو کس قدر جلدی کوئین کا پانی خراب ہو جاوگا۔ اور خاصکر وقت جب مہینہ کے پانی سے ملکر یہ کوئین میں داخل ہو۔ جب تک کوئین کو ڈھپ نہ دیا جاوے۔ اسکا محفوظ رہنا محال ہے۔ یا ایک چوٹی سی دیوار کافی اونچائی کی جس سے مہینہ کا پانی کوئین میں جاؤرک سکے زیادہ بہتر ہوگی۔ اور کوئین کی دیواروں کو ممکنہ سہل یا کسی اور اسی چیز سے لپیپ دینا

چاہئے۔ تاکہ باہر سے پانی داخل نہ ہو سکے بعض کوئین پر ایک لکڑی کا تختہ پڑتا ہے جس پر ہشتی کھڑا ہو کر پانی نکالتا ہے۔ اس سے یہ خرابی پیدا ہوتی ہے۔ کہ اس کے پاؤں کی غلاظت جو بعض وقت گھوڑے کی لید یا کچھ اور اس سے بھی بدتر چیز ہوتی ہے۔ کوئین میں گرتی رہتی ہے جسکی وجہ سے پانی پاک نہیں سمجھا جاسکتا۔ دیوار کا ہونا کوئین کے گرد اسوجہ سے بہتر ہے کہ اس سے گرد و نواح کی زمین کا علیظ پانی اس میں نہ نہیں سکتا۔ اور سطح کے پانی کی غلاظت کا ہم اندازہ شکر کے عام استعمال سے رکھا سکتے ہیں۔) جتنا کوئین کی دیواروں کو لینے سے غیر مدخل کیا جاوے۔ اتنا ہی زمین کی غلاظت سے کنواں محفوظ رہیگا



یا در ہے کہ کنوآں اپنے اصلی گہراؤ سے  
چار گنا زیادہ زمین پر حاوی ہوتا ہے۔ پس اس سے  
اندازہ لگا سکتے ہیں کہ کس قدر زمین پر غلاظت  
پہنکنے سے زمین بد اثر پیدا ہوتا ہے۔ اگر ایک  
کنوآں 30 فٹ یعنی ۵ گز گہراؤ میں ہو۔ تو  
چالیس گز تک گرد و نواح کی زمین پر حاوی ہوتا ہے  
یعنی چالیس گز زمین کے سطح سے زمین غلاظت  
داخل ہو سکتی ہے۔

اگر کوئین سے بذریعہ پانی نکالا جاوے  
تو ہمیشہ دمان ڈول کا استعمال کرنا بہتر ہے۔  
مشک کا استعمال کسی پینے والے پانی کیلئے ناجائز سمجھا  
جانا چاہئے۔ اس امر کو معلوم کر نیکے لئے صرف تنہا ہی  
ضروری ہے کہ ایک مشک کو کاٹ ڈالا جاوے

اور پھر اس میں دیکھا جاوے۔ کہ اوسکے اندرونی  
حالت کیا ہے۔ امید ہے کہ اس تجربہ کے بعد  
اب مشک سرکہ ہی پانی نہ پیوینگے +  
پانی جو گرہنے والے کوئین سے یا جو چرسہ کے

ذریعہ نکالا گیا ہو۔ پینے کے قابل نہیں ہوتا۔

کیونکہ رت جس سے چرسہ بند ہوتا ہے۔

کھینچنے کے بعد عموماً گوبر یا اور کسی بدترین چیز سے

لپٹ جاتا ہے۔ پس دوبارہ کوئین میں ڈالا جاوے۔

تو اس سے پانی کا غلیظ ہو جانا بعید از قیاس نہ ہوگا۔

اگر بارک اور خیموں کے پانی کے مصفا ہونے

میں کوئی مشک ہو۔ یا اوسکے ملاحظہ کر نیسے زمین

غلاظت ثابت ہو۔ تو اوسکو فوراً اُبلانے یا چھاننے

سے صاف کرنا چاہئے۔ اور یہ ضروری دیکھنا لازم ہے۔

کہ یہ اچھی طرح سے ابالا گیا ہے اور نہ صرف گرم  
کیا گیا ہے۔ کیونکہ گرم کے مارنے کے لئے ابالنا  
ضروری ہے۔ اور گرم کرنے سے گرم تباہ نہیں  
ہو سکتے۔

جب پانی ابل جاوے۔ تو سرد کرنے کے  
واسطے اسکو کھلا نہیں رکھنا چاہئے۔ کیونکہ جو  
سے اسکا پیر غلیظ ہونیکا احتمال ہے۔ اس میں گرم کر پڑے  
جس الٹی مین پانی ڈالنا ہوا کو زمین پر گرے کیونکہ ایسے پانی  
میں غلیظ برتن کا ڈالا جانا پیر اسکو غلیظ کر دیتا ہے۔  
اگر ابالا جانیکے بعد یہ پانی کسی ٹیپ دار برتن کر دیا  
جاوے۔ اور اس ٹیپ کے ذریعہ نکالا جاوے۔ تو  
بہتر ہے۔ اس برتن کا سرپوش درست ہونا چاہئے۔  
تاکہ پانی میں گر دانا نہ داخل ہو سکے۔ پیر اگر تالا لگا لیا جاوے

تاکہ آدمی جلدی میں اپنے برتن کو اس میں  
نہ ڈال دین۔ جس سے تمام محنت ضائع ہو جائیگی  
دریا کا پانی قبل از استعمال ابالا جانا یا صاف  
کیا جانا چاہئے۔ جبکی وجہ یہ ہے۔ کہ دریا  
اپنے گرد و نواح ملک کی تمام غلظت اپنی بہاؤ  
میں شامل کئے لاتا ہے۔ بعض اوقات گندی  
تالیاں اور مین آکر بلجاتی ہیں۔ اور طبعیاتی کیفیت  
تمام مزرعہ زمین کی غلظت بھی اس میں شامل ہو جاتی  
ہے۔ علاوہ زمین کی عام طور پر اپنے غلیظ کپڑے  
اسی پانی میں صاف کرتے ہیں۔  
آج شبہ اگرچہ یہ صاف اور چمکدار معلوم ہو  
اس سے اسکا مصفا ہونا ثابت نہیں ہو سکتا۔ اس  
اس حالت میں بھی زمین بیماری کے گرم موجود ہو سکتی ہیں



## باب سوم تپ محرق یعنی اندرک فیور

اس بیماری سے جتنی تباہی خصوصاً طاری  
کے وقت پیدا ہوتی ہیں ہم ضروری سمجھتے ہیں کہ  
اس سے تکیڈا ہر ایک سپاہی کو آگاہ کر دیا جاوے  
تا کہ وہ اسکا سبب وقوع اور اسکی رکاوٹ کو اچھی  
طرح سمجھ سکے + میں اسکو اوپر بیان کر چکا ہوں  
کہ یہ کس قدر ضروری ہے کہ بیمار فوراً اپنی بیماری کی  
خبر دیوے۔ اور جتنا اسکو ضروری سمجھا جاوے۔ اسقدر  
تہوڑا ہے۔ کیونکہ اگر وہ تپ میں مبتلا ہو کر اپنی  
نوکری پر قائم رہیں تو انکی جلد صحت یابی کا موقع

اس امر کے فیصلہ کیلئے اسکی گرد و نواح کی زمین  
مکانات رہائش اور گندگی کے گڑبڑوں کا ملاحظہ کرنا  
چاہئے۔ اور اگر یہ ثابت ہو جاوے کہ چشمہ کا  
پانی مصفا ہے۔ اس حالت میں اس امر کی خبر داری  
ہونی چاہئے۔ کہ نکالنے کے وقت یہ خراب  
نہ ہو جاوے۔ اگر زمین کی سطح اجازت دیوے  
تو اسکو بذریعہ ٹالی کے کھینچا جاوے۔ جو چمنٹین  
ضروری وقت کیلئے مہیا کر سکیں۔ بوتلیں جنہیں  
یہ پانی جمع کیا جاوے۔ وقتاً فوقتاً ابلتے ہوئے  
پانی سے صاف کرنی چاہئیں۔ یہ بخون کا طرہ ہے  
کہ بوتلوں کے صاف کرنا پانی غلیظ نہ ہوئے۔  
اور اُبلایا ہو۔ کیونکہ خراب پانی سے سب خطر  
پیدا ہو سکتے ہیں۔

دن بدن کم ہو جاتا ہے۔ اور بیماری کے زیادہ  
پہلے کا اندیشہ بڑھتا جاتا ہے۔ یہ یاد رہے۔  
کہ انٹرک فیور ایک زہریلی بیماری ہے۔  
اب اس ہر کا فیصلہ کرنا کہ انسان کس طرح  
چھپا سکتا ہے۔ کہ وہ تب مخرج میں مبتلا ہے۔  
اور اسکی بدنی حالت میں کیا تغیرات واقع ہوتے  
ہیں۔ وہ اس طرح ہو سکتا ہے۔ اول تو وہ بوجہ  
بدنی حالت کے ناقابل کام ہو جاوے گا۔ پرورد  
اعضاء یعنی سر۔ بازو۔ کمر۔ و ٹانگوں میں مبتلا  
رہے گا۔ ہو کہہ کی کوئی خواہش نہ ہوگی۔ اور غالباً  
مرور ہی شروع ہو سکتے ہیں۔ ڈاکٹر عموماً ان  
آدمیوں کا ملاحظہ کر لیتے ہیں۔ جو حتی الامکان ایک  
ہفتہ یا کم و بیش بیماری کے مطلع کر نیسے پیشتر

اپنے کام میں لگے رہتے ہیں۔ مگر اس عرصہ میں  
بیماری اپنا پورا اثر کر لیتی ہے۔ انتریون میں زخم  
یعنی زخم پیدا ہونی شروع ہو جاتی ہیں۔ اور  
وہ ایک سخت سخت تب میں گرفتار ہو کر گر پڑتے  
ہیں ہر ایک سپاہی کو یہ یاد رکھنا چاہئے۔ کہ تب  
مخرج کی خصوصیت انتریون میں زخم پیدا  
کرنی ہوتی ہیں۔ کیونکہ تندرستی کی حالت میں بھی  
پاخانہ کی ناثر کاغذ سے ہی تیلی حالت میں ہوتی  
ہوتی ہے اور ہوس ہر ایک چیز کو کہانی جاتی ہے۔ اگر  
اد سے انٹریون میں سے گزر جاتا ہے۔ اور اس کا  
میں وہ زخموں پر اور بھی خراش پیدا کرتی ہے۔  
جب یہ حالت ہو۔ تو سوائے اسکے کہ جلدی  
ہسپتال میں داخل ہو کر پورے طور علاج اور دوا



یعنی دودھ وغیرہ کا انتظام کیا جاوے اور کوئی چارہ نہیں ہے۔

اپنی بیماری سے مطلع نہ کر دینے سے وہ نہ صرف اپنا ہی صحت یا بی کا موقع ہاتھ سے دیتا ہے بلکہ اپنے ساتھیوں کیلئے بھی منہ نقصان ہو جاتا ہے۔ خصوصاً اُنکے لئے جنکی صحت میں بوجہ نکان سفر سے نقص آگیا ہو۔ یہ نقطہ قابل یاد ہے۔ کہ صرف کمزور آدمی ہی زیادہ بیمار کا شکار ہو سکتا ہے۔ لہذا صحت کو قائم رکھنا ایک ضروری امر ہے۔

اگر تم یہ سوال کرو کہ وہ اپنے ساتھیوں کے لئے کیونکر منہ نقصان ہو سکتا ہے۔ اور کس طرح سے تپ محرقہ کے پیلو انکا اس سے بچا

ہے۔ تو میں صرف اسبقار کہونگا۔ کہ بیمار بیدار خود انٹرک کرم کا ایک میگزین بن جاتا ہے۔ غالباً یہ کرم خوراک پانی۔ یا دودھ کے ذریعہ استھین داخل ہوئے ہوں۔ لیکن جب یہ ایک دفعہ معدہ میں داخل ہوتے ہیں۔ تو پھیل کر نہ یہ صرف معدہ میں محدود رہتے ہیں۔ بلکہ تمام انٹیریلوں اور جسم میں پھیل جاتے ہیں۔ اور بعد ازیں جو چیز جسم سے خارج ہوتی ہے۔ وہ سب میں موجود ہوتے ہیں۔ اگر وہ اپنے کمرہ یا جسم کے باہر کی زمین پر پیشاب کرتے۔ تو زمین ہزار بار کرم سے بھر ہو جاتی ہے۔ اس طرح سے پاخانہ میں بھی کرم کرم لے ہوئے ہوتے ہیں۔ اور جو شخص اس کے بعد اسی پاخانہ میں حاجت کیلئے جاوے

اعلیٰ وہ بیمار ہو جاویگا۔ یا کہ بیان جو اس غلاظت پر بیٹھ جاوین۔ اور اس سے قدرتی غلاظت اٹھا کر بارکون یا باورچی خانوں میں گھسیں تو جس چیز پر بیٹھیں گی۔ خواہ وہ کھانے کی ہو یا پینے کی۔ اسکو زہر ملا کر دیو گی۔ اگر پاخانہ کا برتن فوراً صاف نہ کیا جاوے۔ تو ہندوستان جسے ملک کی خشک ہوا اسکو خشک کر دیو گی۔ اور خاک کی حالت میں اڑا کر اسکو انسان کے کھانے پر اور بارکون میں پہنچا دیو گی جس سے بیماری کے پھیل جانیکا سخت اندیشہ ہے۔ اگر اس پیشاب اور پاخانہ کا کوئی حصہ پینے کا پانی کے کوٹین میں داخل ہو جاوے۔ تو بہت آؤمی جھنڈ کی بیمار ہو جاوے گا اگر سپاہی لوگ کو بالامذکورہ

حالت سے اچھی طرح سے واقف ہو جاوین تو وہ سمجھ لیوینگے کہ تب محرقہ کے بیمار کے سر پر سے کیوں خاص ادویات سے صاف کئے جانے چاہئیں۔ اور بارکون میں کیوں اس امر کا لحاظ اور خبرداری رکھی جاتی ہے۔ جب بیمار بارک سے نکالکر ہسپتال میں لایا جاوے۔ اور کیوں مریض ہسپتال سے نکلنے کے بعد اور کچھ عرصہ تک الگ رکھے جاتے ہیں اور انکے پاخانہ وغیرہ کا انتظام خاص کیا جاتا ہے۔ کیونکہ بیمار کے اوپر ہی کچھ عرصہ تک کرم پاخانہ اور پیشاب میں برابر نکلتے رہتے ہیں۔ اور یہ ہی سمجھ لیوینگے کہ پاخانوں کو صاف کرنا رات کو ڈیرہ گڑہ پیشاب کے کسی برتن سے کیوں ضروری ہیں۔



اور مکھیان کیونکر خطرناک سمجھی گئی ہیں۔  
اور یہ بھی کہ کسی گڑھے میں پاخانہ کرنے کے  
بعد اوپر مٹی کا ڈالنا کیونکر ضروری ہے۔ تاکہ  
مکھیان اُس پر بیٹھ کر بیماری کے پھیلنے کا باعث  
نہ ہو جاوین۔

میں اوپر بیان کر چکا ہوں۔ کہ اپنی بیماری  
کی خبر نہ دینے سے ہر ایک شخص کو قدر نقصان  
دہ ہو سکتا ہے۔

## باب چھام پاخانہ اور مکھیان

غالباً سب سے بڑا باعث جس کے ذریعہ ہندوستان

جنوبی افریقہ یا دیگر ایسے ممالک میں تب مضر قہ پھیل  
سے۔ وہ مکھیوں سے بلاشبہ یہ ثابت ہو چکا ہے  
کہ مکھیوں کے پروں۔ لاتوں اور جسم سے کرم جھپٹ  
جاتے ہیں۔ اس طرح سے بیماری پھیل جاتی ہے  
لہذا مکھیوں کی تباہی میں کوئی دقیقہ فرو گذار نہ  
ہو کرنا چاہیے۔

مکھیوں کو باورچی خانوں۔ پاخانوں اور گڑھوں  
میں کیا تعلق ہے۔ وہ مکھی کی ذاتی تاریخ سے  
معلوم ہو سکتا ہے۔ مختصر کلام یہ ہے۔ کہ مکھیان  
گڑھوں کی لید یا انسانی پاخانوں میں اپنے انڈے  
دیتی ہیں۔ اور انہی پاخانوں اور گڑھوں میں جہاں  
انڈے پڑے جاتے ہیں مکھیان پیدا ہوتی ہیں۔ انکی  
خوراک باورچی خانوں۔ بارکون اور خیموں میں بخوبی

مہیا ہو سکتی ہے۔ یہہ تو لہیف نہ صرف عام مٹھیوں کی ہے۔ بلکہ ہر ایک قسم کی مکھی اسمیں شامل ہو سکتی ہے۔ کیونکہ کلہم اپنے اندر سے پاخانوں میں جیتی ہیں اور اپنی خوراک باورچیانوں سے پاتی ہیں۔ اور عموماً پاخانوں سے اپنے کرم مخلوط پر دن اور حسیں کو باورچیانوں میں لپکا کر خوراک انسانی پر نشان کرتی ہیں اگر تپ مٹھرقہ۔ ٹولینڈری یا ہیفید کے مریض کا پاخانہ والا برتن صاف اچھی طرح سے نہ کیا جاوے۔ تو بیماری کے کرم مٹھیوں کے ذریعہ خوراک کے برتنوں میں بیجا شے جا سکتی ہیں۔

میں نے جو تجربہ اس میں کیا۔ وہ میں اپنے لیکچر میں بیان کر چکا ہوں۔ اور نہ صرف میں بلکہ ایک جمنٹ یعنی تھوڈنگنز اول ہزارس کے نین کمشنر افسر نے بھی

ایک تھوڈری سی گھوڑے کی لید کو ایک بسکٹ کے بکس میں بند کرنے سے کیا۔ جبکا نتیجہ یہہ ہوا کہ اس لید سے ۶۵ مکھیاں پیدا ہوئیں۔ جس سے اسکی اپنی اور اسکے اپنے ہمجولیوں کی اس امر میں تشفی ہو گئی۔ کہ مکھیاں واقعی گندگی سے پیدا ہوتی ہیں۔ لہذا ان آفتوں سے بچنے کیلئے خیمہ کو بالکل اونٹے مبرہ اور صاف رکھنا چاہئے۔ میرا مذکورہ بالا بیان کے نقل کر نیسے صرف یہی مطلب تھا کہ صفا کو ہر ایک کے ذہن نشین کرادوں۔ اور یہہ کہ مکھیاں گندگی سے پیدا ہوتی ہیں اور انکی موجودگی بارک اور خیمہ میں خطرہ سے خالی نہیں ہوتی۔ اور اس امر کا نظر انداز کرنا یہ ثابت کرتا ہے۔ کہ صفائی کی ہر گز پرواہ نہیں کی جاتی۔



جس نالی کو اچھی طرح صاف نہ کیا جاوے۔ جسین  
 عموماً بکھیاں انڈے دئے ہوئے موجود پائی جاتی  
 اگر یہاں سے اڑ کر باور چٹانوں میں یا سپاہی لوگوں کے  
 کپڑوں چروں پر یا بارک کے کمرہ یا شرابخانہ میں  
 وارد ہوں۔ تو اس سے بیماری کی زہر پیلنے کا ز  
 حد اندیشہ ہے اس بلا سے بچنے کیلئے نالیوں کو اچھی  
 طرح صاف رکھنا چاہئے۔ پاخانے کا برتن بعد استعمال  
 کے فوراً صاف کر دیا جائے۔ اور جس برتن میں  
 پاخانہ جمع کیا جاوے۔ اسکو ڈمپ دینا چاہئے۔  
 اور پاخانے کے برتن کو کاربالک ایسڈ سے صاف  
 کر کے اس میں کچھ اور کاربالک ایسڈ چھڑو دینا چاہئے۔  
 نالی میں اتنی غلاظت جمع نہیں رہتی چاہئے۔  
 جس میں بکھیاں انڈے دیکھیں۔ اور کاربالک ایسڈ

لایم یا مٹی کا تیل استعمال کرنے سے بکھیون کا  
 جمع ہونا غیر ممکن ہے۔ ککڑی اور نالیوں کے  
 استعمال کیلئے مٹی کا تیل عجیب موثر ہے۔  
 مگر پاخانہ کے برتن کو ضرور ہی کاربالک ایسڈ سے  
 دھونا چاہئے۔

ہر ایک فہر کو اپنی لین یا احاطہ کو ضرور خط  
 کرنا چاہئے۔ نالیوں۔ یا گندگی کے گڑھوں میں  
 کسی قسم کی بدبو موجود نہ رہے۔ اگر بویا گندگی  
 کا نشان پایا جاوے۔ تو صفائی نامکمل ہے۔  
 یا وہ ہے۔ کہ پاخانوں میں جو گندگی رہے۔ تو بار  
 گھنٹہ سے زیادہ نہ رہے۔ یعنی گندگی کی گاری  
 کے دوسری دفعہ تک صاف ہو جانا چاہئے۔  
 مگر جسے جو کوچ کے آؤقت استعمال کئے جاوے وہ

زیادہ غور طلب ہیں۔ کیونکہ اگر انکو صاف نہ  
کیا جاوے۔ تو اونکے پہلو گندگی سے لپٹے رہتے  
ہیں۔ اور وہ گندگی مکھیوں کے ذریعہ اور  
آدمیوں کے بوٹوں سے چمٹ کر خیموں میں پہنچ  
سکتی ہے۔ ہر ایک آدمی کو اس سے آگاہ  
کر دینا چاہئے۔ کہ پاخانہ پہرنے کے بعد اسپر فدا مٹی  
ڈال دے۔ سپاہی لوگ عموماً اسکی حقیقت سے  
ناواقف ہونیکے وجہ سے اسکی پرواہ نہیں کرتے۔  
حالانکہ یہ اسلئے ضروری خیال کیا جانا چاہئے۔  
تاکہ مکھیاں اسپر میٹھ کر غلاظت خیموں تک نہ  
پہنچاویں۔ کیونکہ خشک مٹی اسکو بے ضرر کرتی  
ہے۔ اضافی پاخانہ کو فرو کرنے کیلئے ایک قسط

گھرا کر رکھا کہوڑا چاہئے۔ اور جو اس گڑھے سے  
مٹی نکلے وہ باریک کر کے ۲۴ گھنٹہ تک کھلی  
ہوا میں پڑی رہے۔ تب دو انچ گڑھے میں مٹی  
بکھیر دیا جاوے۔ تب آئین پاخانہ اور اسکی اوپر  
باقیانہ باریک مٹی کو ڈال دینا چاہئے۔ اس طریقہ سے  
جو گرم آئین پیدا ہوتی ہے۔ وہ کچھ عرصہ کے  
بعد مٹی میں مخلوط ہو کر پودوں کیلئے بے ضرر خواہ  
بنجاتی ہے۔ اور ایک یا دو یا تین ہفتہ کے بعد  
اسمیں غلہ بھی پویا جاسکتا ہے۔ اور اس زمین کی جو  
بہتری ہو جاتی ہے۔ وہ زمین کی قیمت بڑھ جائے  
سے ظاہر ہے۔ جس سے سرکاری آمدنی کا صیفہ  
پیدا ہو سکتا ہے۔ کلہر میں گڑھا کہوڑا پتھر میں  
سخت زمین سے بدرجہا بہتر ہوتا ہے۔



اگر گڑھوں سے کہو دی ہوئی مٹی کو اچھی طرح  
سے باریک کر کے خشک نہ کیا جاوے۔ اور بچائے  
اسکے ڈھیلو میں پٹری رہے تو کرم ہوا میں نشوونما  
پانی کو بغیر انسانی غلاظت کو دفع نہیں کر سکتے۔  
گوئی کو مٹی کے ٹھیلو کو اندر ہوا جگہ نہیں ہو سکتی نیز سیاہ مٹی بھی  
جو اس ملک کو عام ضلوع میں پائی جاتی ہے۔  
باریک اور ہوا میں خشک کرنے سے کار آمد  
ہو سکتی ہے۔ جن اشخاص کا گندگی کے گڑھوں  
کا انتظام کرنا فرض ہو۔ انکو ان معاملات سے  
اچھی طرح سے باہر کر دینا چاہئے۔ اور اسکو بہ  
جاننا چاہیے کہ زمین میں لاکھوں زندہ مخلوق موجود  
جنگو اگر پورے طور سے ہوا آلودہ مٹی سے ملا کر عمل  
میں نہ لایا جاوے۔ تو غلاظت کو فرو کرنے میں کچھ کام نہیں دیتا۔

## باب پنجم شراب سوڈا یعنی منرل پانی وغیرہ

اس مضمون پر میں چند الفاظ لکھنے اسکی ضرورت  
سمجھتا ہوں۔ کہ سپاہی لوگ بازاری بنے ہوئے پانی  
کے خطرہ کو بالکل محسوس نہیں کرتے۔ لہذا فہرل  
کمپنی کو انہیں اس امر سے مطلع کروینا ضروری  
اگر کوئی سپاہی اس پانی کی غلیظ حالت کو نہ سمجھتے  
وقت دیکھے۔ تو وہ خود اس سے پرہیز کرے لگاؤ  
مجھے بنگلور میں ایک ایسی سوڈا وائر کارخانہ میں  
جانے کا اتفاق ہوا۔ اور میں نے اس جگہ بوتلوں کو  
ایک صطبل میں جو ایک بیوں کے پافانہ سے ہوتی

دور پر تھا بھری جاتے ہوئے دیکھا۔ لیکن زیادہ تر خطرہ تو اس میں ہے۔ کہ بوتلوں میں بھرے جانے والے پانی کی کچھ پرواہ نہیں کی جاتی۔ کہ کہاں سے لیا جاتا ہے۔ غالباً ایسی قریب کوئین سے پیلےتے ہیں۔ اور اس امر کی پرواہ نہیں کرتے۔ کہ آیا اسکی گرد و نواح صحیح ہیں۔ یا نہیں۔

بسا اوقات تب محض تو کا باعث یہ باندی پانی ہی ہوتی ہیں۔ ہر ایک پیانی کو مطلع کر دینا چاہیے کہ بازاری پانی پینا کس قدر خطرناک ہے۔ اگر یہ کر دیا جاوے۔ اور ہر ایک بازاری دوکان کو حلقہ سے باہر نکال دیا جاوے۔ تا وقتیکہ کہ مالک ملاحظہ کیا جانا منظور نہ کرے۔ بیماری قہر کم ہو جاوے گی۔ بہر حال بت بار کون سے بازار حقدور درجن

اسی قدر اچھا ہے۔

نیز یہ پانی اگر چھنٹ کے اپنی کارخانہ میں ہی بنایا جاوے۔ اور دیسوں کے ماتھے سے فروخت ہوئے۔ تو اسوقت ہی یہ خطرہ خفالی نہیں ہے۔ کیونکہ دیسوں کی غیر مصفا عادات اسکے مانع ہے۔

دودھ

ہر ایک پیانی جانتا ہے۔ کہ خاص پر نہیں دودھ کے خراب ہو جائیگا کیا جانا چاہئے۔ مگر یہ نہیں سمجھتا۔ کہ کیوں۔ اسلئے یہ یاد دلانا چاہئے۔ کہ دیسوں کی عادات صبح کے وقت کیا ہوتے ہیں کس قدر قلیل پانی سے وہ پاناہ جاتے ہیں اور بعد ازاں بغیر ماتھے دھونے کے



گائے کا دودھ نکالتے ہیں۔ اور اونکے غلیظ  
 مائے ہون سے دودھ بہکر مٹکے میں جمع ہوتا ہے۔  
 اور مٹکی بذات خود غلیظ مٹی سے باغی ہوئی ہوتی  
 ہے۔ اور اسی مٹی سے مائے جانیکے بعد غلیظ پانی  
 سے دھوئی جاتی ہے۔ اور پھر کسپر بہہ کہ دودھ  
 کی مقدار زیادہ کرنیکے لئے پانی ملا دیا جاتا ہے۔  
 اور یہ پانی ہی کچھ مصفا نہیں ہوتا بلکہ ہر کوٹھن سے  
 دستیاب ہوتا ہے۔ خواہ کیسا ہی ہو۔ مجھے یاد ہے  
 کہ شبہ میں جو ابر بہا واقع ہے۔ میں نے ایک  
 دیسی کو بار کون میں دودھ لیجا کر دیکھا۔ اسنے  
 کچھ حصہ پی کر مقدار کو پورا رکھنے کیلئے ایک غلیظ  
 مائی سے پانی ڈال دیا۔ سیالکوٹ میں ایک دیسی  
 گوالہ نے لوگوں کے دیکھتے دیکھتے ایک مویشیوں کے چوپے

سے اس دودھ میں پانی ڈال دیا۔ جو اسنے شیش  
 ہسپتال میں دیا تھا۔ بہت سے وقوع تب  
 کے ایسے دودھ کے باعث ہو کر ہیں  
 یعنی بنگلہ۔ اور بریلی اور ممبئی اور دیگر بندرستان  
 کے اسٹیشنوں پر شیشہ دباؤ پڑی۔  
 اسکا سبب بازاری دودھ ہی فرض کیا گیا تھا  
 سکارلٹ سنجار کے مریض کا دودھ نکالنا  
 یا گوامسیا کے گھر میں کسی ایسے مریض کا  
 موجود ہونا اس بیماری کے پھیلنے کا سبب ہوا ہے۔  
 دق ایک اور بیماری ہے۔ جو دودھ سے  
 پیدا ہو جاتی ہے۔ یہ سپاہی کیلئے جاننا شایاں  
 فرض ہوگا۔ کہ فیصدی پچیس گائے مذب میں  
 اس مرض میں مبتلا ہوتی ہیں۔ اور یہ کچھ عجیب

امری نہیں ہے کیونکہ رات دن آنکھ اندھیرے بند صلیب  
میں رکھا جاتا ہے۔ اگر پتائوں میں سے ایک پر بھی  
پتیاں نمایاں ہو جاویں۔ تودق کی بیماری کو پھیلنے کا  
اسباب موجود ہو جاتے ہیں۔ آجکلہ میں آنا کہدینا  
ہی ضروری سمجھتا ہوں۔ کہ دق کے ریش کی تہوک  
اور مکان محبوب سے پیدا ہو سکتی ہے۔ اعداد ہوتا  
سپاہیوں میں قریب فیصدی پیتا لیس سے کم ہو گئی  
ہے ڈیڑ یا یہی دودھ سے پیدا ہو سکتی ہے۔

جب یہ ثابت ہو گیا۔ کہ دودھ بیماری کے پہلے  
کاباعت ہو سکتا ہے۔ پس اسکا پاکیزہ اور مصفا ہونے  
پر حقد رجح کیجاو توڑی ہی۔ اگر دودھ مشکوک  
ذریعہ سے حاصل کیا جاوے۔ تو اسکو بغیر گرم کر کے  
استعمال نہ کرنا چاہئے۔ کیونکہ اسطرح سے تام خطرناک

کرم مر جاتے ہیں۔

خمر

اسکے متعلق چند ضروری باتیں ہر ایک فسر اور  
نن کشند فسر کو یاد رکھنے چاہئیں۔ تاکہ وہ اس  
امر کا خود فیصلہ کر سکے کہ آیا شراب کا روار کہنا اور  
ہے یا نہیں۔ شراب جسم میں جا کر بغیر تحلیل ہونے  
خون میں مل جاتی ہے۔ اور اس سے ذیل کے اثر پیدا  
ہوتے ہیں۔

اول۔ جلد میں خون کی نمایاں پھیل جاتی  
ہیں جس سے چہرہ کا سُرخ اور جسم کا گرم ہونا  
عام نتیجہ ہے۔

دویم۔ دل کی رفتار اور جوش سب بڑھ جاتی ہے۔  
سیویم۔ معدہ میں کمزوری پھیل جاتی ہے لہذا اس مرتبہ



بڑھ جاتی ہے۔

چہارم۔ کل سنون کی قوت معمول سے کم ہو جاتی ہے۔

اپنے مدعا کو پورے طور پر بیان کرنیکے لئے مین ایک مثال پیش کرتا ہوں۔ ایک سواروں کے کیمپ کو ٹیپوں میں جانیکا حکم دیا گیا۔ رات کو سردی بہت پڑی۔ اور زمین کے پڑ آب ہونیکی وجہ سے ہر ایک آدمی اکڑ گیا۔ لہذا تمام جماعتی گرمی کی ضرورت پڑی ایک سائین حکمران نے جسکو خمر کے اصلی جوہر کا کچھ علم نہ تھا۔ نیک نیتی سے مصنوعی گرمی پیدا کرنیکے لئے ایک دو خمر کا حکم دیا جس سے نتیجہ اس کے خیال سے برعکس ہوا۔ و سکی نے تمام جسم کی خونی نالیوں کو پھیل دیا۔ جس سے زیادہ گرم خون سرد ہوا کے دباؤ

مین آگیا۔ اور جسمی گرمی کے فرو ہوئیے سردی محسوس ہونے لگی۔ اب یہ سوال پیدا ہوتا ہے کہ سردی کے موقع پر قدرت کیا کام کرتی ہے۔ جلد میں خون کی نالیاں زیادہ سکڑ جاتی ہیں جس سے خون کی گرمی کم سردی کے دباؤ میں آتی ہے۔ یہاں تک کہ سردی میں ہر ایک روٹکٹا جو بدن پر کھڑا ہوتا ہے۔ اس سے چمڑہ اور زیادہ سخت ہو جاتا ہے جسکی وجہ سنون کا سکڑنا ہے۔

یہاں تک تو شراب کا اثر جسم پر پڑتا ہے۔ لیکن اسکا دل پر کیا اثر ہوتا ہے۔ اور کہاں تک یہ دماغ نقصان دہ ثابت ہوئی ہے۔ وہ مین ذیل میں بیان کرتا ہوں۔ تم یہ کہو گے کہ یہ ہر بالکل مشروع ہے۔ کہ ہم اپنے دل کی قوت کو بڑھائیں اور دوزخ کو تھمیں

کرین۔ یہ ہرگز درست نہیں۔ دل صرف اتنا ہی کام کرنے کے قابل ہے۔ جتنی آسانی سے کر سکتا، اور اوپر زیادہ زور ڈالنا بالکل ناجائز ہے۔  
دل ہی ایک نفس ہے۔ جو ایک منٹ میں <sup>۱۰</sup>۱۰۰ دفعہ چلتی ہے اس اعتدال سے اسکو بڑھانا درست نہیں۔ معمولی کام ہی اسکے واسطے کافی ہے۔

اور اگر اس سے زیادہ کام لینے کا ارادہ کیا جائے تو عموماً نصیبن اصلی مقدار کام کرنے سے ہی عاجز ہو جاتے ہیں جیسا کہ ہم نمبر ۳۴ میں اوپر دکھا چکے ہیں۔ نہ صرف دل ہی بلکہ تمام اعضا جسم میں شراب کے دینے سے بے سود ہو جاتے ہیں اسلئے سفر میں خمر بالکل نہیں دینی چاہئے۔ سوا ان حالتوں کے جو ہم آگے بیان کریں گے۔

دینا جائز رکھو۔ تو اس طرح ہر ایک آدمی کا دل غیر ضروری وجہ سے کمزور ہو جاوے گا۔  
یاد رہے کہ دل کام کرنے کے لئے مضبوط رہنا چاہئے۔ کیونکہ کمزور دل کا آدمی مضبوط دل والے آدمی کے برابر کام نہیں کر سکتا۔

لیکن خمر کسی حالت میں دینی ہی مفید ہوتی ہے۔ یا نہیں۔ یقیناً ہو سکتی ہیں۔ مثلاً جب ایک آدمی ہماری خمر سے تہکا ہوا خیمہ میں پہنچے جب بوجہ تکان کچھ شہتا ہو۔ ایک قلیل دیر خمر خوراک کے پہلے دینا بیش قیمت ہے۔ کیونکہ یہ معدہ کی خونی نالیوں کو اور قوت ماضیہ کو بڑھا دیتا ہے۔ (دیکھو نمبر ۱۳۱ پر) ایک اور موقع پر یہی بہ مفید ہو سکتی ہے۔ اور وہ ایک نیر سفر



کو انجام کو تیرا ایک روز تیرا ادسوقت آدمیوں میں  
سفر کو طے کر نیکی کافی طاقت پیدا کر دیگا۔  
فسران کمپنی وین کشنڈا فسران کیلئے اپنے  
آدمیوں کو اس امر سے مطلع کر دینا ضروری ہے  
کہ کھانچر پہلے اور خمر استعمال نہ کریں۔ اگر وہ ایسا  
کریں گے۔ تو انکی صحت قائم نہ رہیگی۔

## باب ششم

### دربارہ لباس

مطل یا لہٹہ کے کپڑے بدن پر کس قدر  
خطرناک ہیں۔ ایسے بیان کر نیکی کچھ ضرورت  
ہیں۔ اون یا فلا لین کا جامہ اپنا جامہ بغیر ہیں

کیون۔ جبکہ میں ذیل میں جواب دیتا ہوں۔  
کیا اس امر کو نہیں سمجھ سکتے۔ کہ پسینہ کے بعد  
سپاہی لوگوں کا کپڑا بدلتا کیون ضروری سمجھا جاتا  
ہے۔ اور کیون فلا لین پہننے سے سردی کا لگنا  
زیادہ ممکن ہو جاتا ہے۔ مگر لہٹہ کے کپڑے میں نہیں  
اگر کوئی اسکا باعث سمجھ لے۔ تو وہ زیادہ تر سردی  
سے بچ سکتا ہے۔ بہ نسبت دوسرا آدمی کے۔  
یا درہے۔ کہ سردی کا لگ جانا مختلف  
امراض کا سبب ہے۔ یعنی مروڑ۔ پیچھے کا مچھوڑ  
ہونا۔ آئین جلن کا مخصوص ہونا۔ خونی دست وغیرہ  
ہوتے ہیں۔ لہذا جتنا اس سے بچا جاوے اچھا ہے۔  
ادنی کپڑے روئی کے کپڑے سے فضیلت ہوتی ہے۔  
کیس حالت میں روئی کا کپڑا پسینہ سے ہینگ کر مر

ہوا کو جسم سے باز نہیں رکھ سکتا۔ دلی کپڑا پسینہ کو جذب کر کے سرد ہوا کو بدن تک پہنچا نہیں دیتا۔ ادنیٰ اور فلائین کے کپڑوں کو ہوجہ سے بھی روٹی کے کپڑے پر ترجیح ہے۔ کہ جس طرح یہ جسم کی گرمی کے اخراج کو روکتے ہیں۔ اوسطیج بدن پر سوراخ کی گرمی کو پھونکنے سے روک کر جسم کو گرمی کے موسم میں سرد رکھ سکتے ہیں۔ ادنیٰ کپڑے کا گرمی کے اخراج کو روکنا کی یہ وجہ ہے۔ کہ اسکے پٹے عموماً چکے ہوتے ہیں۔ اور پٹا اُچھٹا اُچھٹا اگر رکھی رہتی ہے لہذا اور لٹل کے کپڑے میں یہ خوبی نہیں پائی جاتی۔ دگر گرمی کو نکال دیتے ہیں۔ اور اسلئے گرمی میں رہنے سے جسم کو بچا نہیں سکتی۔ اور سردی میں جسم کی گرمی کو جلدی سرد ہوا میں نکال دیتے ہیں۔ فلائین کی قمیز

اور نسین کل فلائین کے کپڑے بہت خراب دھوئے جاتے ہیں۔ کیونکہ یہ سکر کر سخت ہو جاتے ہیں۔ اور اسکی وجہ یہ ہے۔ کہ چکنائی انکے ریشوں سے اُبلنے سے نکل جاتی ہے۔ لہذا انکا دھویا جانا اُبلتے پانی میں نامناسب ہے۔ اگر انکو دھویا جاوے۔ تو صرف نیم گرم پانی اور اچھے صابن ہی دھویا جاوے۔ اور اسکو بہت سختی سے نہ چھڑا جاوے۔ سب سے اچھا طریقہ یہ ہوگا۔ کہ سجائی صابن کے ملنے کے صابن کی چپاک نکال کر انکو اوس میں ڈبو دیا جاوے اور بعد ازاں اسکو نیم گرم پانی میں جھگل دیا جاوے۔ پیرٹ کے گرد موسم گرم پانی پٹی کا باندھنا خصوصاً رات کے وقت جبکہ مفید کہا جاوے ہو یا ہی



## باب ہفتم مرض بادل یعنی انٹریاں

جو مرض انٹریوں میں پیدا ہوتی ہیں۔ یعنی  
مرور اور خونی دست الکا انحصار زیادہ تر خوراک  
صفائی پانی اور خیموں اور بارکون پر ہے۔ اگر  
انسان کو اچھا رہنا منظور ہو۔ تو خوراک اپنی حقیقت  
سے بنوادی۔ اگر یہ ظرب طریقہ سے پکائی  
جاوے۔ یا بد ذائقہ ہو۔ تو ہضم نہیں ہوتی جس  
سے انٹریوں میں ایک جسم کی نشوونما پیدا ہو جاتی  
ہے۔ جس کا نتیجہ مرور اور بیماری ہے۔

اور جس آدمی کی صحت پر فرق آگیا ہو۔ وہ جلدی  
تپ خمرہ یا کسی اور بیماری کا شکار ہو جاتا ہے۔

جیسا کہ میں پہلے ذکر کر چکا ہوں سو فحشہ افریقہ کی  
لڑائی میں جو ہتر ہزار تپ خمرہ اور مروروں کے  
مریض ہسپتال میں داخل ہوئے جس سے زیادہ  
ہوا ہے۔ کہ اگر اسکی رگادٹ کے وسائل پر  
انسان حاوی ہو۔ تو ہسپتال کا ناغیر ممکن نہیں ہے  
اگر وہیل کے چاروں جانب کوئی نظر رکھا جاوے۔  
تو انٹریوں کی بیماریاں بہت کم ہو جائیں۔  
اور وہ یہ ہیں۔

اول خوراک اچھی ہو اور پوری طور سے پکائی جاوے۔  
دوئم۔ سردی سے بچنا۔  
سیوئم۔ پانی مصفا۔

چہارم خیمہ اور بالخصوص زمین کو صفائی۔  
ان امور پر غور کر کے جاپانیوں نے چین اور جاپان کی لڑائی جیت

میں فی ہزار ایک سو آٹھ بیماروں سے فی ہزار دس تک  
گھٹا دیا۔

غالباً مڑوں کا باعث خداز زمین ہوتی ہے  
اگر آپ اسکا تجربہ کرنا چاہیں۔ تو ایک چھٹ کا  
خیمہ ایسی زمین پر لگا دیں جو انسانی گندگی سے پر  
رہی ہو۔ تو آپ جلدی دیکھیں گے۔ کہ مڑوں کی مرض  
خورا پیدا ہو جاوے گی۔

## باب ہشتم صفائی

(۱) بدن کی صفائی رکھنا ایک بڑا ضروری امر ہے  
اور نن کمشنڈ اخسراں کو اس امر پر غور کرنا چاہیو  
کہ آدمی عموماً غسل کیا کریں۔ ورنہ جلد کے سوراخ

میل اور پینہ سے بالکل تہہ ہو جاوے۔ اور  
کام کر نیکے قابل نہ رہیں گے۔ جس سے نہ صرف  
کچھ نہ رہے گا۔ بلکہ گرد و ن کو بھی  
زیادہ محنت کرنی پڑے گی۔

ہر ایک آدمی کو اپنے دانت ہر روز صاف کرنے  
چاہئیں۔ ورنہ خوراک کے ٹکڑے و انتوں میں پھنس  
جاوے۔ جس سے نہ ہی صرف دانت خراب ہو جاوے  
بلکہ مدہ میں نقص پیدا ہو جاوے گا۔ اگر اس بات  
کی کا حقہ احتیاط کیجاوے۔ تو ہم دانت شہ سے  
آرمیوں کو کم پاؤں گے۔ جسکو اگر لڑائی پر بھیجا جاوے  
تو کسی انٹری کی شکایت سے بہتال میں داخل ہو جائے  
جیسا میں اوپر کہہ چکا ہوں۔ مضمون سے بچنے کے لئے  
اور تندرستی کو قائم رکھنے کیلئے اپنی قوت ماضیہ پر



لنگا ۵ کہو۔ اور قوت۔ ہاضمہ کے قائم رکھنے کیلئے  
دانتوں کو صفائی ضروری ہے۔

جو آدمی خود مصفا ہوگا۔ وہ ہر ایک چیز اپنے  
گرد و نواح میں صفائی اور قرینہ سے رکھینگا۔ بدن  
کے کپڑوں کو عموماً بدلنا۔ اور دھلوانا چاہئے تاکہ  
کپڑوں میں جتنی پسینہ کی غلاطت ہو نکل جاوے  
اور یہ یاد رہے کہ پسینہ میں زیریلا اثر جو بدن  
نکلتا ہے۔ موجود ہوتا ہے۔ پیگے ہوئے کپڑوں  
میں مت بیٹھو۔ بدن کو تولیہ سے پونچھ کر خشک کرو  
اور رات کو وقت پیٹ پر پٹی باندھنے سے  
جگر کو سردی کے داخل ہو نیسے بچاؤ۔  
شراب نوشی سے پرہیز کرو۔ ورزش میں جتنی  
زیادتی ہو سکے۔ کرو۔ خوراک میں احتیاط رکھو۔

اور عموماً چست و چالاک رہو۔ یاد رہے کہ ہر ایک  
سپاہی کو بارک اور خیموں میں ایک دوسرے کے  
ساتھ رہنا پڑتا ہے۔ اسلئے صفائی سہ کو تاہی  
کرنا نہ صرف اس کے لئے بلکہ اس کے ساتھیوں کے  
لئے بھی ضروری ہے۔

(۲) دربارہ صفائی بارک کمرے۔ علاوہ فرش  
دیوچون صندوق۔ مینروں۔ الماریوں۔ وغیرہ کی  
صفائی کے سپاہی پر لازم ہونا چاہئے۔  
کہ جو ہوا یہ سانس کے ساتھ اندر لیون۔ وہ مصفا  
اور تازہ ہونی چاہئے۔ نہ کہ وہ ہوا جو انسانوں  
سے خارج ہوئی ہو۔ چونکہ جب ہوا اندر سے خارج  
ہوتی ہے۔ تو پھیپھروں سے زیریلہ مادہ سے  
نخلوط ہوتی ہے۔ اسلئے ان دن کشند افسران کو

یہ ہر لحاظ سے خطر ہے۔ کہ اس امر سے وہ اپنے  
آدمیوں کو مطلع کر دیں۔ نہیں تو دیکھ کہڑکی وغیرہ  
کو بند رکھنے سے دے اپنے ہی خارج کردہ ہو کر  
دوبارہ دم کے ساتھ اندر داخل کر لیتے ہیں۔  
اونا کو یہ بھی یاد رکھنا چاہئے۔ کہ پسندیشیاب  
و پانخانہ کے اور اخراج دم کے ذریعہ ریریلی ہشیا  
اندر سے نکلتے رہتے ہیں۔ اور انا کو اگر تندرست  
رہنا منظور تو انہیں خارج شدہ ہو کر اندر داخل نہ  
ہونے دینا چاہئے

آدمیوں کا خیموں میں بارکون سے زیادہ  
تندرست رہنے کی وجہ یہ ہے۔ کہ خیموں میں  
دروازہ اور کھڑکیاں بند ہونیوالی نہیں ہوتیں۔  
اور چونکہ انکے پہلو کافی بلند ہوتے ہیں۔ اسلئے

آدمی کو تازی اور صفا ہوا کافی ملتی رہتی ہے۔  
دق کی بیماری کا زیادہ سبب خراب  
ہوا کا اندر داخل ہونا ہے۔ اور ہر ایک سیاہی کو  
یہ سمجھا دینا چاہئے۔ کہ دق کے مریض کی  
بلغم میں اسباب بیماری کے پہلنے کے زرحہ  
موجود ہونے میں جو دق کے مریض کی بلغم  
خارج ہوتی ہے۔ اس میں اس بیماری کے کرم  
موجود رہتے ہیں۔ اور فرش پر جت بلغم ہوگی جاو  
اور وہاں خشک ہو جاوے۔ تو خاک کی حالت  
میں اگر کرموں میں داخل ہو جاتی ہے۔ او  
جس آدمی کے اندر سائنس لینے سے یہ داخل  
ہو۔ وہ غالباً اس بیماری کا شکار ہو جاتا ہے۔  
اس امر کا ثبوت یہ ہے کہ حکیم لوگ دق کے



بیمار کا بلغم خورد میں کے ذریعہ ملاحظہ کرتے ہیں تاکہ آئینہ کرم کی موجودگی کو معلوم کریں۔ اور یہ بات کہ دق کی بیماری مریض کی تہوک کے ذریعہ پہلتی ہے۔ ایسی مشہور ہو گئی ہے کہ ہر ایک مصیبت کاؤں اور ریلوے گاڑی میں عام طور پر آکر شہا حبان دیکھے جاتے ہیں جس پر لگاڑی میں تہو منع کیا جاتا ہے۔ بعض وقت اسکو جرم قرار دیکر سزا ہی دیکاتی ہے۔

اب یہ سوال کہ دق کا علاج کیا ہے۔ سوائے اسکے اور کوئی احسن علاج معلوم نہیں ہوتا۔ کیمیز کو جہاں تک ہو سکے۔ تازہ میصفا ہونے پر کما جاوے اور خواہ کیسا ہی موسم کیوں نہ ہو اس کے سونے کے کمرہ کو کھلا رکھنا چاہئے۔

خراب ہوا کو اندر رکھنے سے گلے کے کئی مرض پیدا ہو جاتے ہیں۔ جس سے انسان کو تپ ہو جاتا ہے خطہ ہے۔ سواروں کو اس مرض سے خبردار کر دینا چاہئے۔ کہ ان کے گھوڑوں کو بھی صاف ہوا کی ضرورت ہے۔ اور تازہ قیکہ فرانس نے اپنے گھوڑوں کیلئے ہوا دار صطبل تیار نہ کئے اذکی تعداد ہوا ت اسیان فی ہر ۱۸۵۵ ہٹی۔ لیکن جب صطبل ہوا دار بن گئے۔ اور گھوڑوں کو کافی تازہ ہوا ملنے لگی۔ تو فوراً وقت اس وقت سے فی ہر ۲۰۰ تک آگئی۔ اور اس امر کے گواہ منسن صاحب بہادر ہیں۔ دودھ کے بیان میں ذکر کر چکا ہوں۔ کہ فی صدی چھبیس گلے۔ بڑے قصبوں میں ہر ہزار میں مبتلا

ہوتی ہیں۔ اور یہ بہ سبب نہ کافی ہوا ہو بچنے کے ہوتا ہے۔

میں اس مضمون پر اسلئے اتنا زور دیا ہے۔ تاکہ سپاہی لوگوں کو تازہ ہوا کے فوائد اچھی طرح سے ذہن نشین ہو جاویں۔ اور یہ کہ دروازے اور درِ چوں کو بند رکھنے اور فرش پر ہتھوکنے سے کیا نقص پیدا ہوتے ہیں۔

(۳) باورچی خالوں اور خوراک کی صفائی۔ اس امر میں بہ ضروری ہے کہ باورچی خالوں میں کھین کو آنے نہ دیا جاوے۔ اور باورچی خالوں میں پانی بذریعہ مشک کے نہ لیجا یا جاوے۔ کیونکہ اسکی بہت احتیاط ہونی چاہئے۔ پکانے والے تیلوں کو خبرداری سے صفا اور پاکیزہ رکھنا چاہئے۔

(۴) خیموں اور گردو نواح کی زمین کی صفائی۔

اسپر توجہ دینی از حد ضروری ہے۔ ان وجوہات سے جو میں آگے بیان کر چکا ہوں۔ خیموں کے گردو نواح کی زمین پر پیشاب یا پاخانہ۔ یا غلط کام پھینکا بہت نقصان دہ ہے۔ تمام لعید۔ گھاس وغیرہ کو زور قمرہ صفا کر دینا چاہئے۔ ورنہ زمین غلیظ ہو کر مکھیوں کو پیدا کر لگی۔

اگر خیمہ کے قریب یا گردو نواح کی زمین پر پیشاب یا پاخانہ پھرا جاوے۔ تو یہ یاد رہے کہ بہت محرقہ کے کرم مدت تک زمین میں زندہ رہ سکتی ہیں۔ اگر اس مرض کا مریض زمین پر پیشاب یا پاخانہ پھرے۔ اور یہ مٹی کے ساتھ مل کر ہوا کے ذریعہ خیموں میں پہنچ جاتی ہے۔ اور اگر



دم لینے سے اندر داخل ہو جاوے۔ تو مرض  
تب بخیر فوراً پیدا ہو جاتی ہے۔ تب بخیر  
کا اسوجہ سے پیدا ہوتا۔ ہم کافی طور پر ثابت کر  
چکے ہیں۔ اور یہ آدمیوں کو اچھی طرح سے یاد رہے۔  
کہ اس امر پر تاکید کرنا اسلئے ضروری سمجھا گیا ہے۔  
کہ وہ اس امر سے غافل نہ ہو جاوے۔ یہ خاک میں  
حرف آدمیوں میں دخول کر کے خرابی پیدا کرتی ہے۔  
بلکہ پانی اور خوراک کو بھی پلید کر دیتی ہے۔ اور اس  
بارہ میں مراکو کے خیمہ یعنی اسٹیمپ کا جو  
مری کے پہاڑوں میں واقع ہے۔ پلید ہو جاتا  
پیش کرتا ہوں۔ اس خیمہ میں پینے کا پانی ٹوٹن  
سے جاتا تھا جسکے گرد ایک مسقوف دیوار تھی۔  
لیکن اس دیوار میں دریچے تھے۔ اور یہ دریچے بے

بے پردہ ہی سے کھلے رہ جاتے تھے اس کو ٹین  
سے اسی گز کے فاصلہ پر پتھر ڈن اور مویشی بار بردار کا  
کا اسطبل تھا۔ اور نیز اسی زمین پر آدمی بھی اپنی  
رفاع حاجت کیا کرتے تھے۔  
اگرچہ اس امر کے بارہ میں حکم نافذ ہو چکا تھا مگر کسی  
خیر بانوں نے اسکی پرواہ نہ کی۔ یہ غلاظت وہو  
میں سوکھ کر خاک کے ساتھ مل جاتی۔ اور وہ اس  
اگرچہ جب کبھی کوٹین کے دریچہ کھلی رہ جاتی تھی  
اسمیں داخل ہو جاتی۔ اور بسا اوقات کوٹین میں  
گھوڑے کی لید وغیرہ پانی کے سطح پر دکھائی دیتی۔  
اگر گھاس وغیرہ کوٹین میں داخل ہو سکتی تھی تو گندگی  
آلودہ گرد اس میں کیونکر داخل نہ ہو سکتی ہوگی اگرچہ  
کوٹین کی طرف سے چلتی۔ تو وہاں کر انسانوں

کی خوراکوں پر جا پڑتا۔ لہذا اس سے یہ ثابت ہوا کہ کمپ اور بارکون کی گرد و نواح کی زمین کو حیاط صفا رکھنا چاہئے۔ ورنہ بیماری ضرور پھیلے گی۔

## باب ہفتم

### مچھروں اور موسمی بخار کے بارے میں

چونکہ فوج میں اکثر بیماری کا باعث ہوتا ہے اس وجہ سے مچھر کا جاننا ضروری ہے۔ سنہ ۱۹۱۱ء میں ہندی افواج انگلشیہ میں موسمی بخار کے مرض ۱۸۲/۱۸۱ ہسپتال میں داخل ہوئے جس کا سبب مچھر ہی ثابت ہوا۔

یہ کہ مچھر ہی کے ذریعہ ایک انسان سے دوسرے انسان تک بیماری پھیل سکتی ہے۔

پورے طور پر ثابت ہو چکا ہے۔ اور یہ نتیجہ خوردبین سے ثابت کیا گیا ہے۔ لیکن تاہم ذیل کا علمی تجربہ بخیر فائدہ نہ ہوگا۔ کولونیل ڈیٹن نے ۱۹۰۱ء میں ڈاکٹر ان سمبول اور لو کوہا نرض سے اٹلی کی مقامات میں بیجا گیا جہان کے موسمی بخار کثرت سے ہو رہا تھا تاکہ وہ اس امر کی تصدیق کریں کہ آیا مچھروں سے محفوظ رکھ کر وہ تپ سے بچ سکتے ہیں۔ اس امر کی تحقیق میں ہر دو ڈاکٹر ان اس مقام میں اور ایسا جھوٹری نیلے کپڑے کے پردے دروازوں اور درجوں کے آگے ڈاکٹر رہے۔ جہان کسی اور طریقہ سے ایک رات بھی بغیر تپ کے رہنا غیر ممکن ہوتا ہے۔ اٹلی کے سانوں کی طرح کیتھول میں خشکی اور بارش



موسم میں بھی وہ برابر کام کرتے ہوئے ہوتے اسکے  
 کہ سوچ غروب ہونے سے برآمد ہوتے تک  
 وہ اپنے تئیں محفوظ شدہ چھوٹری میں بند  
 رکھتے تھے۔ اور سونے کے وقت پڑا ہوا  
 لیا کرتے تھے۔ اور انہوں نے کوئین کو ہرگز  
 استعمال نہ کیا۔ اور جس حالت میں تمام کسان  
 وغیرہ تب کا شکار ہو رہے تھے۔ یہ ہر دو  
 ڈاکٹر ان مجھ اپنے نوکروں کے تین مہینہ تک  
 وہاں بالکل تندرست رہے۔ اس امر میں  
 اور زیادہ تصدیق اس سے ہوتی ہے۔ کہ سبھی  
 بیمار کے مریضوں کو مجھے کٹوائے گئے تھے۔  
 اور پھر مقفوس کر کے انگلستان کو روانہ  
 کئے گئے۔ لڈن میں پہونچنے پر انہیں دو

کٹوا یا گیا جو چند دن کے عرصہ میں ہی تب  
 میں گرفتار ہو گئے۔ اتنا کہ دنیا ہی ضروری  
 ہے۔ کہ ان دونوں حکیموں میں سے کوئی  
 بھی پھلے تب سے بیمار نہ ہوا تھا۔

اسکی زیادہ ثبوتی یہ ہے۔ کہ تب کے  
 مریضوں کو کچھ مجھے کٹوائے گئے۔ اور یہ  
 مجھے پھر مقفوس کر کے پھر انگلستان کو روانہ  
 کئے گئے۔ لڈن میں پہونچنے پر یہ دو  
 حکیم کٹوائے گئے اور چند ہی دنوں میں  
 دونوں حکیم بیمار ہو گئے۔ میں یہ بیان کرنا  
 ضروری سمجھتا ہوں۔ کہ ان دونوں حکیموں  
 میں سے کوئی بھی تب یعنی ( ) سے  
 پھلے بیمار نہ ہوا تھا۔

اب اس امر کا فیصلہ ہونا چاہئے کہ  
 مچھر کہاں سے آتے ہیں۔ اس کا جواب یہ  
 ہے کہ مچھر اپنے انڈے سطح پانی پر دیتے  
 ہیں۔ اور وہ ان میں تیرتے رہتے ہیں۔  
 وہ دن کے سیر جانیکے بعد یہ بچے نکلتے ہیں  
 (یعنی لاروی بناتے ہیں)۔ یہ بچے بہت چھوٹے  
 $\frac{1}{4}$  انچ سے زیادہ لمبے نہیں ہوتے۔  
 جو پانی کے سطح کے نیچے ادھر ادھر تیرتے  
 رہتے ہیں۔ کیونکہ انکو ہوا کی بھی ضرورت  
 ہوتی ہے۔ جب یہ لاروی بڑھ کر زیادہ  
 بڑے ہو جاتے ہیں یعنی (پوپی) کی حالت میں ہوجاتے  
 ہیں۔ تو پانی کی سطح پر تیرنا شروع کر دیتے  
 ہیں۔ تب اس وقت وہ پردہ جو (سپی کیس)

ہوتا ہے۔ پھٹ جاتا ہے۔ اور مچھر جو پہلی  
 اندر ہی اندر نشوونما پکڑ رہا ہوتا ہے تیار نکل کر خالی  
 پردہ پر بیٹھ ہو جاتا ہے۔ اور جب اسکے پر  
 سوکھ جاتے ہیں۔ تو یہ اڑ جاتا ہے۔ انڈے  
 دینے والے مچھر کے نکلنے کا عرصہ چودہ دن ہوتا  
 ہے۔ یہ تفصیل اس لئے ضروری سمجھی گئی ہے۔  
 تاکہ یہ ہر ایک کے ذہن نشین ہو جاوے۔  
 کہ مچھر اپنے انڈے دیکر پہلا حصہ اپنی زندگی  
 کا پانی میں بسر کرتے ہیں۔ پس اگر بارکون کے  
 ارد گرد پانی کا جمع ہونا اور چھپرون کا رہنا ناممکن  
 کر دیا جاوے۔ تو مچھر دن کا پیدا ہونا ہی ممکن  
 ہو جاوے گا۔  
 اگر پانی کا جمع ہونا رگ نہ سکے۔ تو یہ پانی



کم از کم ہفتہ میں ایک دفعہ بدل دینا چاہئے۔  
اور چونکہ مچھر انڈے سے چودہ دن میں پیدا  
ہوتا ہے۔ سو جب سے لگو پیدا ہونیکے واسطے وقت  
نہ مل سکیگا۔

یہ بھی یاد رہے۔ کہ ان ایام میں مچھر  
سطح پر یا سطح کے نیچے ادھر ادھر ہوا لینے  
کے لئے تیرتا رہتا ہے۔ اگر آکو ہوانہ دی  
جاوے۔ تو یہ مرجاتا ہے۔ اسوقت اگر سطح پانی  
پر مٹی کا تیل ڈالا جاوے۔ تو مچھر دم گھٹنے سے  
مر جاتا ہے۔

ان طریقوں سے مچھر کا پیدا ہونا جو چودہ  
دن کے عرصہ میں وقوع میں آتا ہے۔ ناممکن  
ہو جاتا ہے۔ پابالکل ہی تباہ کیا جاسکتا ہے۔

یہ امر ملحوظ خاطر رہے۔ کہ اگر مچھر شہر جاوین  
یعنی نشوونما پکڑ کر قوی ہو جاوین۔ تو کسی طریقہ  
سے اسکا تباہ ہونا غیر ممکن ہے۔ اور یہ کبھی  
نہیں ہو سکتا۔ کہ مچھر دن کو چھاؤنی یا بارکون  
میں پکڑ کر مارا جاوے۔ لیکن جب یہ عاظر ہوں  
یا پانی پر تیر رہے ہوں۔ تو انکا تباہ کرنا ایک  
علیحدہ بات ہے۔

اس امر کیلئے (مسیکو بریگیڈر) یعنی مچھروں  
کے تباہ کرنے کا کردہ ہر ایک اسٹیشن پر بنایا جاتا  
جکا فرض یہ ہوتا ہے۔ کہ ہر ایک چھپر کو بھر دیا  
جاوے۔ اور عمدہ نالیوں کے ذریعہ سو پانی  
کہیں جمع نہ ہونے پاوے۔ جس طریقہ سے  
انکے پیدا ہونیکا مقام موجود نہیں ہو سکتا۔

اور وہ چھپر چپے پانی نہ نکل سکے اور کسی سطح پر مٹی کا تیل ڈال دین غیر مستقل کو بون کو بند کر دیا جاوے۔ اور اس ہر کو خاص غور سے دیکھنا کہ بار کون اور احاطہ کے گڑھوں کو ہر ہفتہ خالی کر دیا جاوے۔ تاکہ انکے اندر سے جمع ہو کر ٹھہر پڑا نہ ہو سکیں۔ مسکینو بریگیڈز کا یہ بھی ایک فرض ہونا چاہئے۔ کہ وہ بارک کے گرد و نواح کا گھماں کٹوا دیں۔ تاکہ اسکی نمدار زمین میں ٹھہر اندر سے نہ دیکھیں۔ تمام آبی اجاع نزدیک اور اندر بار کون کے زیر نظر رہنا چاہئے۔ اسلئے کہ زمین ٹھہر پیدا نہ ہو سکیں۔ مثلاً آگ بجھانوالے بو کے بھی بعض وقت ٹھہر کے پیدا کرتے ہیں۔ اگر کسی باعث سے تمام مچھر پیدا کر نیوالی جگہ کا

استطام نہ ہو سکے۔ تو کم از کم حتی الامکان ٹھہر کا تپ کر مون سے زہریلا ہو جانا روکا جاوے۔ اب یہ سوال پیدا ہوتا ہے۔ کہ یہ کس طرح ہو سکتا ہے۔ سو اسکے اور کسی طرح سے بہترین ہو سکتا کہ مریض جو تپ میں گرفتار ہوں۔ بارک میں نہ رہنے پاویں۔ اور کو ضروری ہسپتال میں زیر پرہ جالی یعنی مسکینو کرٹن رہنا چاہئے۔ اگر ایسا آدمی بار کون میں رہے۔ تو یہ یاد رہے۔ اسکے خون سے تپ کے گرم پیدا ہو جاتے ہیں۔ اور اگر کوئی ٹھہر اسکو کاٹ کر یہ خون پی لیوے پھر بعد از ان جبکو کاٹیکا۔ وہی اس مرض میں مبتلا ہو جاوے گا۔ ایک اور بھی طریقہ ہے۔ جس سے تپ



یعنی ریگورگ سکتا ہے۔ اور وہ استعمال  
کونین ہے۔ یہ ثابت ہو چکا ہے۔ کہ کونین  
تپ کے کرمون کیلئے زہر قاتل ہے۔ اسی سبب  
کونین پر یڈ زہر ایک اسٹیشن میں جہاں موسی  
بخار کثرت سے ہو۔ قائم کیلگی ہے۔ کونین تپ  
کے کرمون کے لئے ایک رکاوٹ ہے جو کرم  
ٹچر کے کاٹنے سے انسان کے خون میں پیدا  
ہو جاوین۔ وہ کونین کے ذریعہ فوراً مر جاتیں۔  
لیکن سب سے مفید حفظ صحت کیلئے ٹچر  
کے پردے ہیں (یعنی مسکینو کرٹن) اس پردہ کو  
مربع اور بے سوراخ ہونا چاہئے۔ اگر ایک ذرہ  
سا سوراخ بھی پردہ میں ہو۔ تو ٹچر اپنے گھسنے  
کیلئے فوراً کافی کر لیتا ہے۔ اور پھر عموماً شاہدہ

میں بھی آسکتا ہے۔ ٹچر پہلے اس سوراخ کے  
ارد گرد گھومتا ہے۔ اور موقع پا کر ایک ہی چپٹیک  
سے اندر گھس جاتا ہے۔ لہذا سوراخ دار پردوں  
کا ہونا نقصان دہ ہے۔ کیونکہ بجائے حفاظت کے  
اس میں ٹچر بہت سے جمع ہو سکتے ہیں۔ پردہ کا  
مفید ہونا اسی وجہ سے ہو سکتا ہے۔ کہ سورج کے  
غروب ہوتے ہی جب ٹچر ادھر ادھر بہنا شروع  
کرتے ہیں۔ گر ادیا جاوے۔ ہر حالت میں پردوں  
کو بانسوں کے اندر ہونا چاہئے۔ اور ان کے نیچے  
کے کناروں کو صف کے نیچے دبا دیا جاوے۔ سخت  
غزوری مر ہے کیونکہ اگر کنارے صف کے نیچے نہ دباؤ  
جاوین تو وہ ٹچر جنہوں نے دن بھر کونون میں دیک  
کر بسترہ کے نیچے آرام پایا ہے۔ اب نکل کر اپنی

خوراک پردہ کے اندر تلاش کرتے ہیں۔  
 مچھروں کے قسم بہت ہیں۔ لیکن  
 خوش قسمتی سے صرف ایک ہی قسم یعنی (زوفیل)  
 اس قابل سمجھا گیا ہے۔ کہ ایک آدمی سوت پ کر  
 کرم دوسری ناک لجاوے۔ لہذا ہم اس مچھر کو ریاہ  
 آسانی کیلئے ریگنوسکیٹو۔ یعنی مچھر پ کے نام  
 سے نامزد کریں گے۔

اب یہ سوال کہ ہم اس مچھر کو کس طرح سمجھا  
 سکیں۔ اس کا جواب یہ ہے۔

اول۔ ریگنوسکیٹو جب دیوار یا سقف پر رہتا ہے  
 تو بیٹھے والے سطح کے ہمیشہ زاویہ پر قائم ہوتا  
 جس سے سر کے بل کھڑا ہوا معلوم ہوتا ہے۔  
 جس حالت میں بے ضرر مچھر کا بیٹھنا سب سے کبرہ

کی طرح سے جس وجہ سے اس کا سر اور جسم ٹھنڈے  
 والے سطح کے ہموار ہوتا ہے۔ اور اگر مچھلی  
 ٹانگیں اوپر کی طرف او بھرے ہوئے ہوں۔  
 تو یہ عموماً پیچ کھا کر مچھے کو ہٹے ہوئے ہوتے  
 ہیں۔ اور آہستہ آہستہ جنبش کرتے رہتے ہیں۔

(دو ٹکم) ایگنوسکیٹو کے پردہ دار ہوتے ہیں  
 اور دوسرے مچھر کے ایسے نہیں ہوتے۔

(سویٹم) ایگنوسکیٹو۔ دوسرے بے ضرر مچھر کے  
 مقابلہ میں خاموش ہوتا ہے۔

ایگنوسکیٹو عموماً رات کے وقت باہر نکلتا ہے  
 اور وہ مچھر جو دن کے وقت دیکھے جاتے ہیں۔



اور اکثر کاٹتے ہیں وہ بے ضرر ہوتے ہیں۔  
وہ بے بالخصوص اپنی خوراک رات کے وقت  
تلاش کرتے ہیں۔ یا عین صبح کے پہلے وہ اپنی  
پیدائش کی جگہ سے بہت کم دور جاتے ہیں۔ ہوا  
اُسکو اُڑا کر دور لے جاسکتی ہے۔ مگر وہ اُسکو پسند  
کرتے ہیں۔ اور جہاں تک ہو سکتا ہے۔ اس  
بچتے ہیں۔ اسوج سے اُعلیٰ یہ دور تک نہیں  
جاسکتے ہیں۔ اس سے یہ نتیجہ پیدا ہو سکتا ہے  
کہ درختوں کے جھنڈ بھی اگیو ٹھہروں کی پناہ  
گاہ بن سکتی ہے۔ کھلے مقامات ہوا سے ڈر کر  
یہ چھوڑ دیتے ہیں۔ روشنی بھی ان کے واسطے کشش  
نہیں ہو سکتی۔ اور وہ ٹھہر چرائے کے گرد جمع ہو  
جانے ہیں۔ وہ بے ضرر ہوتے ہیں۔ علاوہ

سیاہ کی مقامات کو وہ گھری نیلی چیزوں پر بھی  
بیٹھنا بہت پسند کرتے ہیں۔ اور زرد رنگ کے  
کپڑوں سے بھی حتی الوسع اجتناب کرتے ہیں۔ اشیاء  
چرم پر یعنی زین بوٹ وغیرہ پر بھی بیٹھنا پسند کرتے ہیں۔  
دن کو وقت اگیو سیکڑو چھوٹے یوں اور گھروں میں  
سو کر رہتے ہیں۔ اور بالخصوص خالی گھروں میں جیسا کہ  
دھوئیں ہو سیاہ شدہ پیسٹ کو گھر والی سقف پر ہوتی ہیں  
اور گاہ بگاہ نئے گھر زمین۔ یا سفید دیواروں میں پائے  
جاتی ہیں۔ اسلئے حتی المقدور بارکولن کی دیواروں اور  
چھتوں کو کلی سے سفید کر دینا ضروری ہے۔ بارکولن میں  
عموماً ٹھہر اُس جگہ کو پسند کرتے ہیں۔ جہاں سیاہ رنگ  
کو کپڑے دیواروں اور الماریوں پر معلق ہوں۔

راؤ لینڈی میں انگریزی سوارڈ کی بارکولن میں اسل

مجھڑوں کے گھر و مٹی سقفوں میں اپنا مکان بنایا ہوا  
تھا۔ جہاں وہ دن بھر سو رہتے تھے۔ خانگی مکانات میں  
وہ پردہ لٹکیے چھپے ہوئے تھے۔ مکان میں جتنے کم پروں ہوں  
انتہائی بہتر ہے۔

جن مختلف طریقوں سے تپ کا پہلنا کر سکتا ہے۔ ہم اپنا  
بیان کر چکے ہیں۔ لیکن انکی پیدائش کے مکانات کو بغیر  
غور و فکر پر وہ کچھ استعمال دواؤں اور دیگر چیزوں پر جالیوں  
کو پردہ مریضان تپ کو ہسپتال میں بھی بنایا۔ اور استعمال  
کونین۔ لیکن کس طرح سے مجھڑ پیدا ہوتی ہیں۔ ہم ذیل کا انتظام  
جو ہم پیش کرتے ہیں (کی کتاب سے) ہرگز گرم ملکوں کی طرف  
پر لکھی ہے کہ ہمیں۔ اور وہ یہ ہیں۔ چونکہ ایک مادہ  
مجھڑ ایک قسم میں کئی بار اٹھ رہتی ہے۔ اور وہ اندو  
تو ادا صد ہا ہوتی ہے۔ اور ہر ایک نفعہ یا اس کے بعد

انڈی دینے شروع کر دیتی ہے۔ اس سے یہ ثابت ہوتا  
ہے۔ کہ ایک چوڑا مجھڑوں کا ایک ہی موسم گرمیوں کی لاکھ  
مجھڑ پیدا کر سکتی ہیں۔

جیسا ہم ان مضامین کے شروع میں بیان کر چکے ہیں۔  
چین اور جاپان کی لڑائی میں جاپانیوں نے ایک سو آٹھ  
فی ہزار دواؤں تپ کو فی ہزار دو ہزار دواؤں اور جاپان  
کی لڑائی میں لے آئی۔ اور یہ نتیجہ اس امر پر مبنی تھا۔  
کہ انہوں نے جالیوں میں بدن کو ڈھانپنے کیلئے بکشت استعمال کیں  
لڑائی میں اگر سپاہیان کو رات کو مجھڑوں سے  
بچنے کیلئے جالیوں میں جاوین۔ تو بالکل درست ہوگا۔  
سہ کی جالی جو جاپانی اسے اور سپاہیان کو  
دی گئی تھی۔ تو دواؤں سے بھی کم تھی۔  
اور اسکی بناوٹ (اوپر آہٹ) کی طرز پر تھی



جس سے اسکا پہننا ناگوار معلوم نہ ہو۔ اگر ایک  
ایسے ملک میں فوج کا مقام ہو۔ جہاں مجھ  
بہ کثرت پیدا ہوتے ہیں۔ تو تمام چھپرون یا  
آبی ذخیروں کو خشک کر دیا جاوے۔ یا کسی  
اور طریقہ سے پانی کو ہٹا دیا جاوے۔ اگر اس  
مقام پر ڈیرہ رکھنا کچھ عرصہ تک منظور ہو۔  
دروازوں پر پردے معلق کرو۔ اور در پہلے  
کو پتلی جالیوں سے بند کر دیا جائے۔ تاکہ  
مجھراندر نہ آئیں۔ فقط

## غلطی نامہ

نمبر صفحہ	نمبر سطر	غلط لفظ	صحیح لفظ
۱	۳	کوئین و جمنٹ	کوئین و جمنٹ
۲	۵	آرڈر	آرڈر
۳	دستخط	بی ٹی ڈبلیو ڈی جی	بی ٹی ڈبلیو جی
۱	۶	دیسوں میں سبجو	سپاہیوں میں جو فوج
۴	۶	میان جنگ کی	میان جنگ کے
۵	۶	بیرا	بیرا
۸	۱۰	ہتی	ہتے
۱۰	۱۱	لرزہ	لحرقہ
۱۱	۱۲	میدہ	مددہ





نمبر صفحہ	نمبر سطر	غلط لفظ	صحیح لفظ
۵۰	۱	وہی کپڑا	اونی کپڑا
"	۵	روکنا	روکنے
۵۶	"	زیر پلا	زیر پیلہ
۵۷	۱۲	زیر پلا	زیر پیلہ
۵۸	۶	زیر پلی	زیر پیلی
۶۸	۱۳	انہیں دو کٹوا لگیا	انہیں پھر دن سے وچھپ کٹوائے گئے
۶۹	۶	ر	(رائگٹو)
۷۱	۳	بیٹھ ہو جاتا ہے	بیٹھ جاتا ہے
۷۳	۱۰	چپڑ کو پرویا	چپڑے پانی کھنڈوں
۷۸	۶	رائگٹو	کو پرویا جاوے
"	۱۰	رائگٹو	رائگٹو

Major Gibbard's

Book on Kaintali

1/11/08.

H.N.

Under Kaintali



RAME 1212 | 1

1. Labels ~~seized~~ used from my kit-  
used during the South African war.
2. also "PEACE" notice from a local  
S. African newspaper.

Flahibbard

~~Kimberley~~

Capt. Gibbard

R.A.M.C.

~~H<sup>rs</sup> Bas. Durham Light Infantry~~

~~Work~~

~~MAKING~~

~~Kilburn~~

Pretoria

Mapleburg



From

**DAWSON BROS.**  
SHIPPING & FORWARDING AGENTS,  
**SOUTHAMPTON.**

THE "DIAMOND" TAG.

To

~~MAEKING~~

Capt. Gibbard.

R. A. M. C.

~~Highland County~~

Cape Town



Capt. GIBBARD.

R.A.M.C.

~~Kimberley~~

~~Mafeking~~ ~~PRETORIA~~

~~Stoerfontein~~  
Cape Town

1<sup>st</sup> Bn "The Queens" — 100  
 1<sup>st</sup> R. Irish Rifles — 180  
 2<sup>nd</sup> Connaught Rangers — 100  
 2<sup>nd</sup> Berks Regt — 130  
 1<sup>st</sup> R. Sussex Regt — 100  
 12<sup>th</sup> R. Lancers — 100  
 2<sup>nd</sup> East-Lanes. Regt — 75  
 2<sup>nd</sup> Leicestershire Regt — 72  
 10<sup>th</sup> R. Hussars — 80  
 Brigade Major, Standard — 50  
 1<sup>st</sup> R. Irish — 66  
 No. 8 Mountain Battery 30  
 4<sup>th</sup> Essex Regt — 54  
 1<sup>st</sup> King's Own Regt — 50  
 3<sup>rd</sup> Hussars — 40  
 1<sup>st</sup> West Yorks — 32  
 R. Munster Fusiliers — 100  
  
 and many other Regts,  
 Batteries, etc.



1212/2 (1)  
THIRD EDITION.

# NOTES ON SANITATION

IN

BARRACKS AND CAMPS

FOR

OFFICERS AND NON-COMMISSIONED OFFICERS.

BY

MAJOR T. W. GIBBARD,

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## NOTE

BY  
COL. F. J. PINK, C.M.G., D.S.O.,  
COMMANDING,  
1st Battalion, "The Queen's" Regiment.

This little book is a digest of a series of lectures delivered by Major Gibbard, R.A.M.C., S.M.O., Barian, to the Officers, Warrant Officers, Non-Commissioned Officers and selected Privates of the 1st Battalion "The Queen's" Regiment, at this station. It was at my request that Major Gibbard reduced them to Book form, so as to enable even young officers to lecture to their men in these all important subjects. I intend that every Officer and Non-Commissioned Officer with the Battalion shall possess one of these little books, and the subjects dealt with will yearly form part of the Company Training.

FRANCIS J. PINK, COLONEL,  
Commanding,

1st Batt., "The Queen's" Regt.

BARIAN,  
August 1906.

## NOTE

Col. F. J. PINK, C.M.G., D.S.O.

Commanding

1st Battalion "The Queen's" Regiment

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FRANCIS J. PINK, Colonel

Commanding

1st Batt. "The Queen's" Regt.

BARRACK  
August 1906

## PREFACE

### PREFACE TO THIRD EDITION.

Such a short time (five weeks) has elapsed since the second edition of 1,000 copies was published, that no alterations have been found necessary. Some small additions have been made, especially in the chapter on "Cleanliness."

Twenty-two British units in India have already taken up this little book, and it is hoped that others will follow their example, and thus give their Officers and Non-Commissioned Officers some simple facts to go on in instructing men in this important subject.

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### PREFACE.

These Notes were given in lecture form to the Officers and Non-Commissioned Officers of the 1st Battalion, "The Queen's" Regiment, and have been printed at the request of the Commanding Officer to enable him to give a copy to each Officer and Non-Commissioned Officer, in order that, by making a knowledge of sanitation a part of company training in his Regiment, he may reduce preventable disease to a minimum.

I have endeavoured to make the Notes as simple as possible, and it is hoped that they may be of use to Officers and Non-Commissioned Officers of other Regiments in instructing their men. Young Officers coming out to India may also find them useful.

There is purposely a certain amount of repetition, since it serves to impress facts on the memory.

I must express my indebtedness to Colonel Pink, C.M.G., D.S.O., Commanding 1st Battalion, "The Queen's" Regiment, for the interest and encouragement he has given me in compiling these Notes, also to Lieut.-Colonel F. H. Treherne, R.A.M.C., for his criticism and suggestions.

T. W. G.

BARIAN CAMP,  
MURREE HILLS, PUNJAB,  
August 6th, 1906.

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## NOTES

ON

# SANITATION

## IN BARRACKS AND CAMPS

FOR

## OFFICERS AND NON-COMMISSIONED OFFICERS.

### CHAPTER I.

#### GENERAL REMARKS ON THE IMPORTANCE OF THE SUBJECT.

The necessity for every officer and man in the Army knowing the main facts of sanitation is clearly shown by reference to the following statistics, taken from an excellent "Lecture on Hygiene" by Captain G. J. Stoney Archer, R.A.M.C. (Journal

of the Royal Army Medical Corps, December 1905). For every 1,000 men present in the following wars there were admitted to hospital :—

			For wounds and injuries
		For disease.	
Ashanti	.. 1873-74 ..	474	70
Nile	.. 1884-85 ..	808	22
Soudan	.. 1885-86 ..	1,100	46
China	.. 1900-01 ..	1,051	10
South Africa	.. 1899-1901 ..	746	34

These figures show that a tremendous number of men are admitted to hospital during war for disease as compared with wounds, injuries, and accidents. Take the China War of 1900-01, for every 1,000 men who took part in the campaign there were admitted to hospital 1,051 for disease, but only 10 for wounds and injuries. Look at the figures of the Nile Expedition, 808 for disease and 22 for wounds (about 100 to 3), and the

same with all wars. But take our most recent war, the South African: during this war no less than 450,000 men were treated by the Medical Department for disease, but only 22,000 for wounds and injuries, i.e., 20 to 1. Realize the fact that *four hundred and fifty thousand* British soldiers were lost to the fighting force from disease and not from the bullets of the enemy: that for every man who was hit by a Boer bullet 20 were incapacitated from disease, and surely every officer will agree that it is high time he taught his men during peace how to avoid disease.

Let the men know these figures; let them know that during the South African War *seventy-four thousand* cases were admitted to hospital for Enteric Fever and Dysentery alone, and of these nine thousand died, not as soldiers should die on the field of battle, but from preventable diseases.

If you doubt that these diseases are to a large extent preventable, read the following extract from an article by Baron Takaki,



F.R.C.S., Eng. D.C.L., late Director-General of the Imperial Japanese Navy (published in the Journal of the R. A. M. C. of July 1906). In showing the progress made by the Japanese Army in the preservation of health since the Chino-Japanese War, he writes—"Comparing the results of the Chino-Japanese War with that of the recent war with Russia, we find the following facts :—

- (1) That Cholera has practically disappeared.
- (2) That Typhoid Fever cases decreased from 37.14 per 1,000 men to 9.26.
- (3) That Dysentery cases decreased from 108.9 to 10.52.
- (4) That Malaria cases decreased from 102.58 per 1,000 men to 1.96.

These remarkably good results were chiefly the result of the progress made in the medical organization as regards food, drink, clothing, camping ground, etc., and we took great pains to exterminate flies

and to prevent them from coming in contact with our bodies, articles of daily use, and into the dwelling-houses. Nets were used at windows and doors of houses to prevent flies from coming in, also to protect the exposed parts of the body, such as the face, when flies were numerous. This extensive use of muslin nets against flies, and at the same time against mosquitoes, may possibly be responsible, besides the improved sanitary organization, for the remarkable decrease in the number of Typhoid, Dysentery and Malaria cases."

Our army is small compared with some others, and we cannot afford on any future occasion to lose 74,000 men from preventable disease. Let the enemy neglect instruction in sanitation during peace and thus lose, say, four men from disease to our one, and our inferiority in numbers will be largely counterbalanced. Considering the fact that for every man who dies from a wound at least four die from disease, surely it is part of the art of war to

study and instruct men not only in the method of sheltering themselves by trenches, &c., from that one bullet, but also in defending themselves against the germs of disease.

But it is essential that instruction in this subject should be given during peace, and regularly, as part of company instruction; men must be told *why* it is necessary to do this and that; unless they understand the *reason* for attention to different details of sanitation they cannot be expected to carry them out intelligently.

In addition to company instruction, it is desirable that a "Sanitary Cadre" should be formed in each unit, as has been done at Ambala; a Non-Commissioned Officer, and one man from each Company, Squadron or Battery being more thoroughly trained at Station Hospitals by Officers of the R.A.M.C. in Sanitary duties.

This Cadre should be formed of men who, owing to their intelligence and standing with the other men of their company,

are looked up to by their comrades, and their advice listened to—not as heretofore by sending the failures, the bad shots, the worst drills, the dullards, when men are asked for to be put through a course of instruction at the Hospital. There is little use in sending out the fools of the companies to be the apostles of sanitation amongst their comrades. The Regiment with the most intelligent and keenest sanitary Cadre will in peace time have the cleanest barracks, the least amount of sickness, and the sanitary recommendations will be carried out by the men because they know the *reasons* for doing so, not merely because it is a Regimental Order.

The formation of Sanitary Cadres, consisting of one N.C.O. and eight men per Regiment, is probably the best scheme of Sanitary administration for a Regiment. A properly trained and keen Sanitary Section in each Regiment would undoubtedly be the means of saving many lives, and would repay commanding officers. Officers who have seen much active service know that



one of the roads to success lies in maintaining their men in good health. Junior officers do not in many cases realize this, and it is the junior officers, N.C.O.'s and men who must be taught to understand that such diseases as Enteric Fever, Dysentery, Cholera and Ague are to a large extent preventable and how.

Mention has been made above of the "germs of disease." Several N.C.O.'s have recently asked me **what is meant by the term germs of disease?** What are Bacilli and microbes? Can they be seen with the naked eye? This latter question is easily answered; to see the germs of disease (or bacilli) it is necessary to use a powerful microscope, and even then they are only seen with difficulty. They are about one-hundred-thousandth part of an inch in length, a size difficult to realize. A pin's point, you can see it, is many times bigger than a disease germ.

So much for their size, but what do they look like? A diagram is not necessary, for they are depicted in every few

lines throughout this book. I refer to hyphens, full-stops and commas. The majority are straight rods, others are rounded like a full stop, a few (like the cholera bacillus) are comma-shaped; all appear under the microscope smaller than the commas and stops in this book, all are alive and increase by millions in a few days.

The germ of each disease has characteristics of its own, but all with which we are concerned have two characteristics in common, viz. (1) that they thrive wherever there is filth, hence the importance of cleanliness of the body, clothes, food, water, milk and the camping grounds: (2) that they are much more likely to attack a man in a poor state of health than one who is fit and strong, hence the importance of keeping men in a good state of health.

So the chief points to remember about the germs of disease are (1) they are living bodies, (2) they are invisible and can live by millions in a camp without your being aware of their existence until an outbreak

of disease occurs, (3) they thrive and multiply at an enormous rate under insanitary conditions, (4) the power of resistance to the entry into the body of disease greatly diminished by ill-health.

## CHAPTER II. WATER.

It seems scarcely necessary to prove by examples that impure water is a cause of disease, and yet it is a fact that some Non-Commissioned Officers and old soldiers are firmly convinced that water and disease are in no way connected, stating that they have never taken any precautions regarding water, and have drunk water from all sources with no bad results.

That being the case, I think the first thing to do in instructing soldiers as to the necessity for adopting precautions with regard to water is to prove to them by actual cases which have occurred that large outbreaks of disease are often due to water.

The diseases which are most commonly spread by water are Enteric Fever, Cholera and Dysentery. Every soldier should know that the germs of these diseases are contained in the evacuations passed by people suffering from them, and that if any of this gets into drinking water and this is drunk, the man who drinks it will probably suffer from the disease.

Only last year there was a large outbreak of Enteric Fever at Lincoln. The Lincoln Corporation had known for years that the water supply was liable to contamination but reliance was placed on filter-beds; all went well till January 1905, when owing to a severe frost the filter-beds broke down and unfiltered water from ground not protected from pollution was delivered to the inhabitants of Lincoln. All that was now necessary for an outbreak of Enteric Fever was for a man suffering from the disease to relieve nature on this collecting area; this must have happened, for Enteric Fever broke out and was spread all over Lincoln by the



water, no fewer than 268 cases occurring in one week, and increasing to a total of nearly 1,000.

The Caterham outbreak was caused by a workman suffering from a mild attack of Enteric Fever passing his stools near the wells belonging to the Water Company; only those who drank the water from these wells suffered from Enteric Fever, the troops at Caterham used water from another well and so were not affected.

Hop-pickers suffering from Enteric Fever relieved nature on the ground from which the water for Maidstone was collected; this polluted water, containing the Enteric Fever germs, was delivered by pipes to Maidstone, the result being a serious outbreak of the disease.

And so numbers of outbreaks of this disease due to water could be quoted; the main point for us to remember is that in all such cases it is due to the Enteric Fever germs gaining access to drinking water. It is specially worth noting that all three of the outbreaks (Lincoln, Caterham and

Maidstone) were due to men suffering from a *mild* attack of Enteric Fever continuing to follow their occupation. Had they been in hospital their urine and faeces (water and stools) would have been properly disposed of and the outbreaks would not have occurred. I draw special attention to this since numbers of cases of Enteric Fever in the army are due to soldiers suffering from this disease in an early stage continuing to occupy their barracks or tents, using the same latrine as healthy men, perhaps drinking out of the same mug, and probably passing water (containing the germs of the disease) outside their barrack room or tent on the ground. The importance of men who feel out of sorts, with perhaps a little fever or diarrhoea, reporting sick at once, cannot be sufficiently emphasized.

Many outbreaks of Cholera have also been definitely traced to drinking water; the cholera germs, like the Enteric, are contained in the bowel discharges of cholera patients, and if any of this discharge (or

any of the vomit) gets into drinking water an epidemic will occur. As an illustration of this the Broad Street epidemic may be given—in this outbreak it was shown that discharges from a case of cholera were thrown into a cess-pit only a few feet from the Broad Street well, and that nearly everybody who subsequently drank water from this well was stricken with cholera, whereas the remainder of the inhabitants were free from the disease. As if to prove the case up to the hilt, the following occurred—an old lady living at Hampstead, miles away from Broad Street, was suddenly seized with cholera; there had been no cases in this neighbourhood and it was a puzzle to know how she had contracted the disease. Enquiry was made as to where she got her drinking water from, and much to the surprise of everybody it was found that it came from the Broad Street well. The old lady lived in Broad Street many years previous to this, took a special liking to this particular well water, so had a supply sent to her daily in bottles.

Again, in India, an epidemic broke out from a native, suffering from cholera, vomiting on the banks of a river. The germs of the disease got into the water. A *bhistie* (water-carrier) shortly afterwards went down to fill his *mussack*, and he took the water out of the river at a short distance below the place that had been contaminated by the cholera patient. The result of this was that every man who drank of the water from the *mussack* was attacked with cholera. And more than this, the *mussack* itself became contaminated and the germs clung to its walls, so that until it had been flushed many times, the water which was put into it became a means of distributing the disease. At Lucknow a severe outbreak of cholera occurred amongst British Troops (90 out of 600 dying from this disease), due to a filter having been filled with sand taken from the bank of a river where natives infected with cholera germs had been bathing.

Sufficient has been said to show that disease is spread by water, and to an



alarming extent sometimes ; it is only necessary for some faeces from a person suffering from Enteric Fever or cholera to get into a well, or other source of supply, for a large number of men drinking that water to suffer from the disease. Hence the importance of **protecting the water supply** if it is pure, of protecting the ground on which it is collected by clearing villages off it, fencing it in, and allowing no men or cattle on it ; of protecting wells and their immediate surroundings so that dirty water may not get in ; of protecting springs from which drinking water is taken. It must not be forgotten how water is collected in the ordinary wells from which in this country a large quantity of drinking water is obtained. Rain falls upon the ground it soaks through the porous layers of the soil until it reaches an impermeable layer, such as clay, through which it cannot pass. If a well be then dug, no water is found until the impermeable layer is approached. It will be readily understood how the water in the well may become contaminated when the surface of the ground

around the well is covered with filth, and rain washes it down through the soil into the well.

A well cannot be considered to be protected unless it has a cover, a small wall around of sufficient height to prevent any possibility of flooding during the rains, and is lined with cement (or some such material) on the inside as low as the level of an impermeable stratum. Some wells have a wooden plank across the mouth on which the water-man stands : the result is that dirt from his feet (possibly horse-manure or worse) falls into the well. The wall around prevents water from the surface of the ground around from running in, and considering how much traffic there is to a well it is easy to understand how filthy this surface water may be. The impervious lining prevents dirty surface water from gaining access to the well by fissures in the ground.

It should be remembered that a well drains an area of ground around, the radius of which is equal to at least four times its

depth, so that any water which is thrown on this ground is liable to soak into the well. Thus if a well is 30 feet deep, that is 10 yards, the surface of ground for 40 yards all the way round the well drains into it.

If water has to be drawn from a well by hand, always use a metal bucket, and never allow a *mussack* to be used for carrying drinking water. To prove the importance of this, it is only necessary to cut open a *mussack* and see what the inside is like! You would never drink water out of a *mussack* again.

No water for drinking purposes should be drawn from a well which is worked by a *chursah* (large leather bag) with bullocks. It will be readily understood how the rope which is attached to the leather bag will, when drawn up by the bullocks, get seriously soiled by the dung, etc., when lying on the ground, so that each time the bag is lowered into the well, the rope carries down all manner of filth.

Protect the water in barracks and camps, and if there is any doubt about its purity, or if after inspecting its source it is seen that contamination is possible, run no risks with it but purify it by boiling or filtration. If it is to be boiled, see that it is actually boiled, and not simply warmed; to kill the germs of disease it must actually reach the boiling point—warm water has no effect on disease germs, but boiling water kills them.

Having boiled the water, see that it is not subsequently contaminated by allowing it to stand to cool in an uncovered vessel, or dust containing disease germs may blow into it. Do not let the man who removes it stand his buckets on the ground and then dip them into the water which has been boiled, for in this way he washes his dirty buckets in the clean water.

If after boiling, the water is put into a metal receptacle with a tap, see that the water cannot be taken except by the tap. The lid must fit properly or dust will blow in, and it must be locked or men in a



hurry will open it and dip their basins in, thus undoing the good done by boiling.

On active service it may not be possible to boil water on account of want of fuel or suitable vessels : besides water takes a long time to cool : but it should be remembered that it can be used for tea or coffee at once. To make either the water must *boil*. In addition to having water-carts drawn by four horses, the Japanese had water-boiling carts and formed boiled water stations where soldiers could fill their water bottles during a march. Each soldier also had a small mess-tin in which he could boil water when required. The British soldier should be reminded that he can always boil his own drinking water in his mess-tin if necessary.

On service **Berkefeld Filters** are largely used for purifying water. These filters are light and take up little room, but are easily broken, so a large supply should be carried. In using these filters it must be remembered that (1) muddy water requires to be cleared before being passed

through the filter : this can be done by using alum (6 grains to the gallon, or a teaspoonful to ten gallons) and then straining thorough a clean cloth. (2) They must be properly cleaned every three days by means of boiling water and a brush, being put in a vessel of cold water, which is then raised to the boiling point. The filter acts by entangling all microbes in its meshes, but if the microbes are not destroyed by boiling water every few days they will gradually grow through the filter into the channel in its centre and thus render previously pure water impure. (3) When cleaning filter see that it has no crack in it.

**River water** should always be boiled or filtered before being used for drinking purposes ; the reason for this is obvious, rivers being the natural drainage channels of the surrounding country, streams conveying sewage from villages run into them, also surface water from cultivated manured lands during floods. In addition to this the natives are constantly fouling

the banks and wash their clothes in the water.

**Spring water.**—Just because this is clear and sparkling it does not follow that it is pure; it may possess these qualities and yet contain the germs of disease. In deciding as to its purity it is necessary to inspect the surrounding ground, and to look for dwelling-houses, refuse-pits, etc. If it is decided that the spring yields pure water, care must be taken that it is not polluted by men during the process of drawing it. This is best done (where gravitation permits) by conveying the water from the spring to the water-carts by means of a pipe along a trestle: sufficient piping for this could generally be carried by Regiments.

**Collection of water.**—Never leave this to a native. He may drive the cart, but a British soldier should be told off to superintend the collection. Special carts should be used to convey drinking water, which after purification, if this be necessary,

should be stored in metal carts or cisterns. These carts or cisterns should be thoroughly cleaned once a week with boiling water. The necessity of using boiling water will be apparent. It ensures that the water for cleaning is free from dangerous germs, and also it will destroy any germs that by chance might have gained access to the cistern.

**Water bottles.**—Should also be frequently cleaned with boiling water; they are apt to contain old tea leaves, beer, etc., which decompose and cause diarrhoea. It is most important to see that boiling water is used for this purpose, for the dangers of a dirty water bottle are great.

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### CHAPTER III. ENTERIC FEVER.

Considering the great loss to the army from this disease, especially during war, it is of the utmost importance that every soldier should know the main



facts connected with its causation and prevention.

I have mentioned above the importance of men reporting sick immediately they feel ill; this cannot be too strongly impressed on all ranks. Why? Because they may be suffering from Enteric Fever, and if they continue to do their duty with the disease on them, every day reduces their chance of recovery, and every day they spread the germs of the disease about barracks or camp. It must not be forgotten that Enteric Fever is an infectious disease.

Take these points separately—**What should lead a man to suspect that he may be suffering from Enteric Fever?** What would he feel like? He would feel ill, depressed and unfit for duty, with probably headache, pain in his limbs and back, loss of appetite, and perhaps (not necessarily) a little diarrhoea.

Medical Officers frequently see men who have gone on doing their duty as long as possible with the best intentions,

having perhaps felt ill for a week before reporting sick. In the meantime the disease has got a firm hold on them: ulcers (sores in the bowels) commence to form; they have high fever and are in an almost hopeless state when seen. Let every soldier know that the chief feature in Enteric Fever consists of sores in the bowels, that his gut even when healthy is only about the thickness of thin paper (or rather as thin as the ordinary covering of a sausage), that everything solid he eats must pass through his bowels and irritate the sores, and he will understand the importance of getting into Hospital and of being put to bed on proper nourishment (milk, whey, etc.), as soon as possible. Many a poor fellow has lost his life from ignorance of this, for had he known he would have reported sick earlier; and many a soldier has unintentionally been the cause of death of a comrade in Hospital from ignorance of the fact that there are sores in the gut. I refer to "visiting days,"—a soldier is convalescent from Enteric Fever, has had no fever for five or

six days perhaps, and is very hungry, having had nothing but whey, milk, chicken broth, etc., for three weeks or a month. His "chum" goes to see him and gives him a bun, bread or cake. The sick man eats it, the bread or whatever has been given is not properly digested, it gets into the sores in the gut and irritates them; up goes his temperature and perforation of the gut is liable to occur, which means death in a day or so, or a relapse with another three weeks or so fever. A case similar to the above occurred in the Station Hospital here last month (July): a man brought some cake to his "chum" in hospital, who had had no fever for six days; the result was a severe relapse and death after a fortnight.

But not only by not reporting sick early does he lessen his chance of recovery, but **he is a grave source of danger to his comrades**, especially those who are run down in health from fatigue, exposure, etc. This is an important point to remember; it is the man who is run down in health

who is most likely to contract disease; hence the importance of keeping men in good health.

You may say, How is he a source of danger to his comrades? In what way can he spread Enteric Fever?

In many ways, for he is a regular magazine of enteric germs. He took in the germs of the disease with some infected water, milk or food of some sort; the germs multiplied rapidly in his stomach, bowels and body generally; and so everything which leaves his body contains the seeds of the disease. If he passes water on the ground outside his barrack-room or tent he scatters thousands of the germs on the ground. When he goes to the latrine he passes thousands of Enteric Fever germs in his motions, some of which may be left on the seat and so infect the next man who uses it; or flies may settle on the filth in the pan beneath the seat and carry a little of it (containing Enteric Fever germs remember) to the barrack, coffee-shop, kitchen, etc., and thus infect



any food or drink on which they settle ; or, if the filth pan beneath the seat is not emptied at once the filth dries, especially in countries like India, and is blown on the dust about the latrine and barracks to settle on a man's dinner perhaps, and thus spread the disease. If any of his water or motion gets into a well or other source of water-supply, many men in the Regiment may get the disease.

If he shares a mug of beer with another man, both drinking out of the same mug, the other man may get the disease from his mouth secretion, and the same remark applies to all his eating and drinking utensils. His clothing, blankets, etc., soiled by his sweat may hold the Enteric Fever bacilli, and certainly will if they have been soiled by his water or motions.

If the soldier knows the above, he will understand why clothing, etc., used by men suffering from Enteric Fever has to be disinfected ; why certain precautions are taken in barracks with regard to disinfection when a man is admitted to hospital suffering from this disease ; why men on

discharge from hospital after suffering from it are isolated as far as possible for a time, using a separate latrine, etc. (such men pass the Enteric Fever germs in their water for some time after all fever has left them) ; why it is so necessary to keep latrine seats clean ; the necessity for having urine tubs about camp at night ; why flies are such a source of danger ; why after relieving nature in a trench on service he must always throw some dry earth over what he has passed so that flies may not settle on it and carry the disease about camp. He will also understand why he should always use his own eating and drinking utensils, and not drink out of a "pal's" water-bottle (other diseases are spread in this way, syphilis for instance), and why if he feels ill he should at once report sick and not continue to use the same latrine, etc., as other men.

If he does not report sick until he feels very ill, he will probably be the cause of many cases of Enteric Fever. Only two months ago I saw an instance of this ;

a gunner marching with this company from Attock to Rawalpindi felt ill during the whole march (5 days), but did not report sick until he got to the Rest Camp at Rawalpindi, when he was sent to hospital. He was found to be suffering from Enteric Fever and died a week after admission. Another man in his sub-division, who accompanied him on the march, contracted the disease, and several gunners from other batteries who marched to this station with the second man became effected. These men occupied Rest Camps which were subsequently used by a number of Regiments marching to different stations on the Muree Hills, and so the disease was spread to a number of stations in the neighbourhood, at least twelve cases being traceable to this man. Not only this, but it was spread to Aden, for a few weeks later an official communication was received giving the information that a gunner of the same company who was on his way Home, time-expired, and who marched with the same party, had been landed there from a Transport suffering from Enteric Fever.

#### CHAPTER IV. LATRINES AND FLIES.

Probably the chief means by which Enteric Fever is spread in India, South Africa and other countries of the kind, is by flies. That flies do carry the germs of disease on their legs, wings and bodies has been proved beyond doubt, but a simple method of demonstrating the fact was adopted at the Station Hospital, Rawalpindi, by Major C. J. Weir, R.A.M.C. This officer put in the latrines of the station hospital small dishes of broth on which coloured germs were growing; he also put dishes containing broth only in the hospital cook-house, some 30 yards distant. Some of the latter dishes were covered with muslin to prevent flies gaining access to the broth, others were left uncovered.

The flies were seen to settle on the coloured broth in the latrine and fly to the cook-house, where they settled on the uncovered dishes of broth to feed. The



coloured growth of the germs was seen on their legs and bodies, and in a few days the same germ was seen to be growing on these dishes, but not on those protected by muslin. Gauze doors and windows to cook-houses are therefore of use in the prevention of disease by keeping flies out, in the same way that the muslin over the dishes of broth protected the broth, but they must be kept shut. But what is better still is to adopt all measures for the destruction of flies, and the prevention of their breeding.

**The life history of the fly.**—To understand the close connection there is between flies, cook-houses, latrines, filth-trenches and manure, it is necessary to know the history of the house fly. Put briefly, the fly lays its eggs in horse-manure or human fæces; the eggs are hatched out of this in filth-trenches or wherever the manure is deposited, and they feed in cook-houses, barrack-rooms, tents, etc. These remarks apply not only to the ordinary house-fly, but to the blue-bottle and green-bottle fly, all

of which lay their eggs in human excrement and frequent cook-houses for food, probably flying direct from the filth in the latrines (with fæces on their legs, bodies and wings) to the cook-house, barrack-room or wherever there is food. If a man suffering from Enteric Fever, Dysentery or Cholera has used the latrine-pan and it has not been emptied, or even if improperly cleaned, the disease germs will be conveyed by flies settling on these pans to feed.

The following extract from Lieut.-Colonel R. Caldwell's (R.A.M.C.) book on Military Hygiene is interesting :—

"With the object of ascertaining the fate of the flies, earth and nightsoil from filth trenches were placed in a glass box and conveyed to the laboratory at Meerut on December 1st, 1904. The top of the box was next covered with muslin, and the edges of the muslin carefully fastened down with gummed paper, so that it was quite impossible for flies to effect either ingress or egress. The nightsoil and earth were carefully arranged in the box so as to form

an exact imitation of a shallow trench. The box was kept in the sun. On December 4th a fly made its appearance. It was in a sickly condition and promptly died. On the 5th another fly appeared and this survived. On the afternoon of the 6th several flies appeared, and by the morning of the 7th the space between the earth and the muslin was swarming with them. The general course of events seems to be as follows :—The ova (eggs) are deposited in the latrine, and are conveyed in filth-carts to the trenches ; the larvæ and pupæ stage take place beneath the ground, and the developed fly makes its way to the general atmosphere through the covering of earth."

I mentioned a somewhat similar experiment performed by me here at one of my lectures on sanitation, with the result that a non-commissioned officer of the 3rd (K.'s O.) Hussars tried it himself ; he put some horse manure in a biscuit box, covered it with muslin, and hatched out 65 flies, thus proving to his own satisfaction and

that of his comrades that flies breed in manure, and that therefore, if a camp is to be free from these pests, it must be kept clean and free from manure.

Lieut-Colonel A. R. Aldrige, R.A.M.C., Sanitary Officer, Army Head-quarters, India, writes (Annual Report of the Sanitary Officer, Eastern Command, 1904): "Full grown flies are not in most cases to be found in large numbers at the trenches, no doubt because they do not find their natural food there ; but the numbers of larvæ and pupæ, and young flies, some of them with their wings not yet expanded, to be seen on turning up the earth, are so great as to make it difficult to avoid the conclusion that the majority of flies in cantonments are bred there." This officer hatched 4,042 flies out of one-sixth of a cubic foot of soil taken from a filth trench.

I have quoted the above with the object of impressing on the memory the fact that flies mean filth, that they are bred in filth, and if therefore many flies are found in



camp or barracks it means that sanitary matters are being neglected, that manure, rubbish, and filth generally are not being thoroughly removed and disposed of.

In any latrine which is not properly looked after numbers of flies will be found, crawling over the faeces to lay eggs, then settling on the seats with their dirty feet, or flying from the latrine to the cook-house, or taking a ride on a soldier's coat, or even face to a barrack-room or the canteen, and so spreading infected faeces about barracks. To overcome this state of affairs, latrines should be kept scrupulously clean; all seats should be movable so that they can be taken out, scrubbed both sides with soap and water and a disinfectant; pans should be emptied immediately after use into receptacles with properly fitting lids, a solution of carbolic acid should be used in cleaning out the pan and some crude carbolic acid put in afterwards. If there is no filth in the latrine for flies to lay their eggs in, and if some such disinfectant as carbolic acid,

lime or kerosine oil is used freely flies will not go to it. Kerosine oil is a good disinfectant for the wood-work and floor of latrines, also for filth receptacles, carbolic acid being used for the pans.

It should be part of the duty of every officer to visit the latrines of his company or unit daily, and the Quartermaster (and Commanding Officer occasionally) should pay surprise visits to the filth trenches. In neither the latrines nor filth trenches should there be any unpleasant smell or flies; if either are noticed the work is not being properly carried out.

In visiting latrines remember that the filth has to remain there, that is in the immediate vicinity of barracks, until the next visit of the filth-cart, which may not be for twelve hours.

Lieut.-Colonel C. H. Melville, R.A.M.C., now Sanitary Officer to the Army Medical Advisory Board at the War Office, in his Annual Report, Secunderabad Division, 1904, draws attention to the necessity

for more supervision over the removal of filth from latrines, and suggests that "(1) contractors should be compelled to supply good strong cattle to drag the filth carts to the pits, otherwise the driver is apt to tip the contents of the cart in a ditch if his animals are too slow or cannot get as far as the pits; (2) that filth-carts should be paraded by the Jemadar sweeper of each line at a certain hour and despatched to the latrines; (3) that at every latrine there should be a marked spot where the filth-cart should stop: two whitewashed stones, distant from each other 3 inches more than the cart-wheel track, and running between them a cross-bar or stone against which the cart should be backed. The object of this is that the inevitable slopping which will occur whenever a receptacle is emptied into a filth-cart should be localized, so that the danger due to such slopping can also be localized and dealt with."

The filth-carts should be regularly inspected to see that they are as clean as possible and do not leak.

**Trenches used on service** require most carefully looking after, or they become a source of danger, the sides and edges become fouled with filth, in which men step, and so infected faecal matter is carried to the camp by flies or on boots. Every man *must* be taught the importance of throwing earth *at once* over what he has passed into the trench; the Jews did this as long ago as 1451 years before Christ, thus—Deuteronomy, Chapter 23, verses 12 and 13:—

"12, Thou shalt have a place also without camp, whither thou shalt go forth abroad."

"13. And thou shalt have a paddle upon thy weapon: and it shall be when thou wilt ease thyself abroad, thou shalt dig therewith and shall turn back and cover that which cometh from thee."

The British soldier seldom troubles to do this, probably because he does not understand the reason why it is so necessary, namely, in order to prevent flies from settling on it and conveying it to the



tents, and in order that the filth may be purified and rendered harmless by the dry earth.

What happens to filth when put in trenches? It does not disappear of its own accord, there must therefore be some living agency at work. The work is done by countless myriads of minute microbes, the so-called "nitrifying organisms" which live on the filth and convert it into harmless matter. But these little organisms, like ourselves, cannot live and work without air, hence they are only found in the upper layers of the soil, "the first foot or 18 inches" in ordinary soil.

A farmer each year manures his land, then ploughs it up, not to a great depth but superficially, and leaves it exposed to the sun and air with the object not only of killing the weeds, etc., but in order that the air may become thoroughly mixed with the soil so that the little microbes (mentioned above) may have plenty of air, without which they cannot work. And every one knows that ploughing too deep means

a bad crop, unless the land is left fallow for some time, long enough for the air to become mixed with the soil. Having plenty of air they work hard and convert the manure (organic matter) into harmless inorganic matter (nitrates), the latter being the food on which plants live.

And so with the disposal of manure (human) from barrack latrines: a shallow trench one foot deep is dug; the earth removed from this is put on one side of the trench, well powdered with a mallet, and left for 24 hours so that the air becomes thoroughly mixed with it; then 2 inches of this powdered earth is put in the trench, next the contents of the filth receptacle, and over this the remainder of the powdered earth. In this way the nitrifying organisms (little living microbes) act to the best advantage, the organic filth (manure) is converted into harmless matter which is food for plants, and after a fortnight or three weeks Indian corn can be sown on it, the crops being so luxuriant in their growth that the land lets for a good price to

natives, and thus becomes a source of income to the cantonment.

A loose loamy soil is the best to dig trenches in; rock, sand and clay are unsuitable.

If the soil dug out of the trenches is not powdered thoroughly to less than the size of a marble and dried, but is kept in large masses as it is dug out, the minute microbes, not being able to work without air, cannot dispose of the fæces (human manure). Even black cotton soil, which is found in so many districts in this country, can be pulverized if it is first exposed in clod to the action of the sun and air. (Colonel Thornhill). Men told off to supervise filth-pits should be instructed in these matters, and should realize that they have in the earth, working under them, millions of little living bodies, and that these must be treated properly (given sufficient air mixed up with the earth) or they cannot carry out their duties efficiently and dispose of the filth.

## CHAPTER V. DRINKS.

**Bazaar mineral water.**—A few remarks on this subject are necessary, since soldiers do not seem to realize the danger they run in drinking Bazaar mineral waters. Company officers should certainly warn them on this point; no soldier would drink such water if he saw the filthy conditions under which it is made. I remember visiting a Native Soda-water Factory at Bangalore and finding the bottles being filled in a stable within five yards of a native latrine!

Natives (and soldiers too) often drink out of the mouth of the bottles, and when it is remembered that syphilis of the mouth is not an uncommon affection, the danger of drinking water from such bottles will be readily understood, especially when it is known that natives are not at all unlikely to refill the bottle without even an attempt at washing it out.

But the chief danger lies in the fact that there is no check on the source from which



the water to fill the bottles is obtained; natives are likely to get it from the nearest well, no matter how insanitary its surroundings.

Enteric fever has on several occasions been traced to Bazaar mineral waters. Every soldier should be told *why* it is dangerous for him to eat or drink in a Bazaar shop. If this were done, and if every Bazaar shop in the neighbourhood of barracks was put "out of bounds" unless the owner consented to it being under proper supervision, there would be less disease in the army. Bazaars should be as far from barracks as possible.

No matter where the mineral water is made, even if from a Regimental Mineral Water Factory, if hawked by natives it is dangerous on account of the handling, insanitary condition of the native shop, etc.

**Milk.**—Every soldier knows that special precautions are taken to prevent the milk he drinks from becoming contaminated, the Regiment keeps its own dairy cows, special

orderlies are told off to see them milked, the milk is distributed in locked cans, and occasionally (in Regiments in which the importance of a pure milk supply is understood) men are sent out in the early morning to see if they can catch natives bringing milk from neighbouring villages to the dairy.

But does the young soldier understand the reason for all these precautions? I doubt it or he would think twice before touching tea and unboiled milk in native shops, or by the roadside on the march. Remind him of the morning habits of the native: how he goes with his little vessel of water to relieve nature, and afterwards, without washing his hands, probably sits down and milks his cows, the milk flowing over his dirty hands into the pail. Let him imagine the milk-pails scrubbed out probably with polluted earth taken from near the cow-shed, earth which has been contaminated by the cows, and after being scoured out with this, the mud is washed out of the pail with equally dirty water,

and to increase the quantity of milk, water is occasionally added, not pure water as a rule, but the nearest water there is to hand. I remember at Shwebo, Upper Burma, seeing a native taking milk to the barracks. He drank half a pint or so, and then made up the quantity with dirty water from a nullah (ditch). At Sialkot a native cowkeeper was seen to add water from a cattle trough to the milk which was intended for the Station Hospital.

Many outbreaks of enteric fever have been traced to milk; Mr. Ernest Hart tabulated 50 outbreaks in civil life, and the same applies to military life. For instance, in 1904 outbreaks at Bangalore, Bareilly, Neemuch and several other stations in India, milk derived from bazaars was regarded as the probable cause.

Scarlet fever is sometimes spread by milk, due to cows being milked by a person suffering from scarlet fever, or due to there being a case in the house in which the milk-man lives.

Tubercle (consumption) is another milk disease. It may interest the soldier to know that at least 25 per cent. of dairy cows kept in towns are the victims of this malady, and when it is remembered that they are kept night and day in dark, badly ventilated stables, it is not to be wondered at. If any of these cows should be suffering from Tubercular sores on the udders, the milk becomes infected with the consumption microbe and is capable of spreading the disease. In fact, since it has become the fashion to feed infants on the bottle instead of the breast, the death-rate from consumption of the bowels has increased by 27 per cent. amongst infants under one year old. I may add, in this connection, that since it has been recognised that consumption of the lungs is spread by the spittle and is predisposed to by bad ventilation (shutting windows, etc.) the death-rate from this, the usual form of consumption in soldiers, has been reduced by 45 per cent. Diphtheria is also spread by milk.



It therefore being a fact that milk is capable of spreading disease, the importance of obtaining it from healthy cows and of protecting it from pollution cannot be over-estimated. If obtained from doubtful sources it must always be boiled before use ; for this kills all the dangerous microbes.

The milk which is to be used for making butter should also, needless to say, receive as much attention as that which is to be drunk.

**Alcohol.**—There are certain facts connected with the action of alcohol which every officer and non-commissioned officer should know, in order that he may be in a position to decide whether the issue of a rum ration is the right thing or not.

Alcohol when taken into the body is quickly absorbed unchanged into the blood, and has the following effects :—

1. The small blood vessels in the skin are dilated, causing flushing of the face and a general feeling of warmth.
2. The force and frequency of the heart's action are increased.

3. The vessels of the stomach are dilated, and therefore the flow of gastric (stomach) juice is increased.

4. The amount of work the muscles are capable of doing is diminished.

This list probably is rather uninteresting reading to a combatant officer, but if he will only follow me for a few minutes he will find that every point mentioned above is of practical importance to him in his capacity as an officer.

To explain my meaning I will quote a case which recently came to my notice ; a company of a certain Infantry Regiment was sent out to bivouac. It was a cold wet night, every man was wet through on arrival on the ground selected for the bivouac, and therefore required all the heat he had in his body. But the subaltern in command, with the best of intentions, not knowing the action of alcohol, and being misled by the false sensation of warmth which alcohol produces (see 1 above), gave whisky all round, thereby causing exactly the opposite

effect to that which he wanted. For the whisky dilated (enlarged) the thousands of small blood-vessels in the skin, thereby exposing an increased amount of hot blood to the cold air, hence much loss of body-heat and a greater danger of chill. What does nature do when we are exposed to cold? Contracts the small blood-vessels in the skin so that less blood shall be exposed to the cold air, so much so that when in a cold bath every hair in the skin seems to stand on end and the skin becomes harsh, due to all the little muscles in it contracting.

So much for the effect of alcohol on the small blood-vessels in the skin, but how about number 2, the effect on the heart, &c. What injurious effect can this have? You may say, "surely that is just what we want, to stimulate the heart and circulation generally." It is not so, the heart has as much work as it can comfortably do already, without giving it unnecessary work. The heart is a muscle and contracts (beats) 72 times a minute. To increase this rate unnecessarily cannot be sound practice if the

men have more work to do; moreover "the amount of work the muscles are capable of doing is diminished" (see 4 above), so not only the heart muscles but all muscles throughout the body are placed at a disadvantage if alcohol is given. Therefore never give alcohol before or during a march (except as mentioned below) because if you do you will cause every man's heart to do unnecessary work and will decrease the power of their muscles. Remember that the heart must be strong to do work, a man with a weak heart cannot do the same amount of work as a man with a strong sound heart.

But *can alcohol be given under any conditions with advantage?* Most certainly it can. For instance, when men arrive in camp exhausted, after a long tiring march, too tired to take food and with no inclination for it, a ration of rum issued shortly before the food is ready, is invaluable, since it dilates the blood-vessels in the stomach and increases the flow of digestive juices, thereby giving the men an appetite (see 3 above).



There is another occasion on which it is of use, and that is near the *end* of a forced march. A rum ration will give the men just sufficient stimulus to enable them to complete the march.

Men should know that those who drink to excess have not nearly so good chance of recovery when in hospital suffering from some severe illness as the moderate drinker or total abstainer. A stage is arrived at in such cases when some stimulant is necessary to keep the heart going, when whether the man pulls through or not depends upon the reaction of the heart to brandy or champagne. In such cases it is a matter of common sense that a man who has soaked his blood and system with spirits or beer regularly cannot have the same chance as a total abstainer or moderate drinker. I think if men knew this, and that by hard drinking they predispose themselves to diseases of the liver, it might have the effect of causing them to drink less.

Company Officers and Non-Commissioned Officers should also warn their men not to

drink before meals, explaining to them that if they do so they cannot expect to keep in good health. If the canteen is opened before dinner, the men fill their stomachs with snacks of cake, beer, bread and cheese, etc., and then are surprised that they have no appetite for dinner, and even if they have, how can they possibly digest it, meat and vegetables soaked in a stomach full of beer!

The Commanding Officer of a British regiment told me recently that men of his regiment in South Africa had an idea that if they put rum or alcohol of any kind into polluted water it purified it and rendered it safe; this, needless to say, is a mistaken idea and the men should be told so; the alcohol would have no effect on the germs of disease.

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## CHAPTER VI.

### CLOTHING.

The danger of wearing cotton or linen articles of clothing next to the skin is well known, woollen or flannel vests and drawers are much safer. Why?

Why is it important that a soldier when sweating profusely should change his clothing at once? Why is he so much less likely to get a chill if wearing a flannel shirt than a cotton one.

Let him know the reason, and he is more likely to take care of himself in this respect.

Chill, it must be remembered, is the immediate cause of many diseases, *e.g.*, dysentery, abscess of the liver, inflammation of the lungs, diarrhoea, &c., hence the importance of avoiding it. If a man is subject to ague a chill in the early morning due to his not wearing warm underclothing, will often bring on an attack.

The value of wool and flannel as compared with cotton is due to the fact that wool is capable of absorbing much moisture (sweat), and of holding it in its fibres, losing it slowly to the air around the body; whereas a cotton vest soaks up the perspiration but does not retain it, the perspiration is *rapidly* evaporated to the air, much heat is thereby lost and a chill results.

The woollen and flannel articles have another advantage over cotton and linen, *viz.*, that being very bad conductors of heat they not only prevent loss of heat from the surface of the body but keep the body cool in hot weather by not conducting the heat of the sun to the body. The bad conducting power of flannel or wool is partly due to the fibres containing much fat, and partly due to the presence of air entangled between its fibres.

Cotton and linen articles do not possess these properties, they conduct heat rapidly and therefore in hot weather afford practically no protection against the sun, and in cold weather allow the heat of the body to pass to the surrounding cold air.

Flannel shirts, in fact all woollen articles, wash badly, they shrink and become hard; this is due to the fat in their fibres being boiled away, so they should not be boiled but washed in soft warm water with good soap, and not wrung out too forcibly. The best plan is not to rub soap on but to make a lather and soak them in



it, rinsing two or three times afterwards in tepid water.

The value of the cholera belt or of a pattie round the abdomen (belly), especially at night during the hot weather, in preventing chills is too well-known to require any special mention.

## CHAPTER VII.

### TATTOOING.

Nearly all soldiers are tattooed at some time during their service, but I do not think any of them realize that by being tattooed they undergo a risk of contracting syphilis, or consumption, or of getting blood-poisoning. And yet there is a distinct risk of such taking place. Only last week a soldier was admitted to the Station Hospital here with a large abscess over his knee-joint and some fever (blood-poisoning) due to a recent tattoo mark on his leg. The matter was enquired into, the native shop visited with the result that the instruments, etc., with which the operation

was done were found to be in a very dirty condition ; the native, in addition to pricking into the skin Indian ink, wood-charcoal, and vermilion, had pricked in dirt and the microbes which cause blood-poisoning. The shop was put "out of bounds."

Some people object to being vaccinated on the ground that there is a risk of contracting syphilis or some other disease. They can see and know that the small operation is done under the most strict anti-septic precautions, the lymph (vaccine) having been prepared with the utmost care, and everything done to render it quite impossible for syphilis or any other disease to be conveyed by this means, and yet they will deliberately allow a native to tattoo them. They will watch him mix the colours in the palm of his dirty hand with saliva (spittle) from his mouth, or in an imperfectly cleaned saucer with dirty water, and prick this mixture with dirty instruments into the skin. They forget the fact that the native may be suffering from syphilis, and that a very common manifestation of this is sores in the

mouth ; they are ignorant of the fact that consumption is spread by the saliva (spittle).

If men *will* be tattooed they should see that the operator boils his instruments to cleanse them, mixes his colours with water which has been boiled, thoroughly cleanses his hands and the part to be tattooed ; but there must always be a certain amount of risk connected with the process when performed by natives.

## CHAPTER VIII.

### TOBACCO.

A word of warning is necessary regarding the immoderate use of tobacco. Not only does one constantly see in Station Hospitals soldiers (generally of a highly nervous temperament) suffering from palpitation of the heart due to excessive cigarette smoking, but occasionally cases of commencing blindness due to the excessive smoking of shag or cake tobacco. I have seen three cases of the latter during

the past six months in my capacity as Eye-specialist, Northern Command, and whilst working at "Moorfields" (Royal London Ophthalmic Hospital) I saw many such cases.

Good tobacco does not affect the sight, it is the cheap and moist tobacco, rich in nicotine, shag and stick tobacco, which are dangerous. The affection seldom appears before middle life, the man first notices that he is unable to see small print, that he can see better in the evening than the day time, and that he cannot distinguish colours. For instance some men so affected think all their friends look ill because they cannot distinguish the colour in their cheeks. This, unless smoking is entirely stopped, will go on from bad to worse until possibly a state of total blindness is reached.

So it will be seen that the excessive use of tobacco has its dangers, but if used in moderation it is harmless to most individuals. Officers and Non-Commissioned Officers should therefore discourage the excessive use of tobacco since it leads to inefficiency.



Affection of the vision may not manifest itself until after the man has left the service, but as I have said above there are constantly men in hospital for disordered action of the heart or who are so shaky from excessive smoking that they cannot hold a rifle steady.

The power tobacco possesses of relieving the sensation of hunger is well-known, in fact on account of this the Americans have included it ( $\frac{1}{2}$  oz.) in their "emergency ration."

## CHAPTER IX.

### BOWEL COMPLAINTS.

#### DIARRHŒA AND DYSENTERY.

The prevention of bowel complaints is largely a matter of diet, purity of water, and cleanliness of the camp or barracks. If men are to keep well they must have properly cooked food; if it is badly cooked and tasteless it is not digested, irritates the bowels, ferments, causes diarrhœa and

ill-health, and a man run-down in health is much more likely to contract enteric fever or some such disease than a man in good health.

Food and drinks offered for sale in cheap Bazaar Restaurants should be avoided since they are prepared by natives who have no idea of cleanliness, and are under no supervision.

For instance, a native fruit-seller in Rawalpindi Bazaar was recently seen washing fruit to freshen it up in an open drain outside his stall and which at the time was being flushed out. Food of this kind is a common cause of Enteric Fever, Dysentery and other bowel disorders. Therefore Officers and N.C.O.'s should advise men to avoid such shops, and to obtain all their food and drinks from Regimental Institutes which are under proper supervision.

As I have already mentioned, during the South African War there were 74,000 admissions to hospital for enteric fever and dysentery, so the importance of a know-

ledge of the causes and prevention of dysentery is obvious.

If these four points are attended to *viz.*, (1) good and properly cooked food ; (2) avoidance of chill ; (3) purity of water ; (4) and cleanliness of the camp, especially the ground, there will be very few cases of men in hospital for bowel complaints. By attention to these points the Japanese reduced the number of dysentery cases from 108 per 1,000 men in the Chino-Japanese War to 10 per 1,000 in the recent war.

Probably one of the chief causes of dysentery is polluted ground ; encamp a regiment on an old camping site, where the ground is saturated with filth, especially human fæces, and dysentery will almost certainly break out.

## CHAPTER X. CLEANLINESS.

I. Personal cleanliness is very important. Officers and Non-Commissioned

Officers should see that all men serving under them *bathe* frequently, otherwise the pores of the skin become blocked with dirt and sweat and cannot act, thereby throwing much extra work on the kidneys, and retaining in their bodies certain poisonous matters which it is the function of the skin to eliminate.

All men should clean their *teeth* daily, or food collects between them, and decomposes, resulting in decay of the teeth and a disordered condition of the stomach. Too little attention is paid to this matter or we should not so frequently see men with numbers of teeth decayed, men who if sent on active service would soon be in hospital for some bowel complaint due to this cause. As I have said above, the chance of avoiding disease depends largely upon the state of the health, the state of the health depends largely upon the condition of the digestion and bowels, which in their turn depend upon the teeth. Now that men are supplied with a tooth-brush at Government expense they can have no



excuse for not cleaning their teeth, especially if warned to do so by Officers and Non-Commissioned Officers. If found by Medical officers to have neglected their teeth they should be liable to punishment.

A man who is clean himself likes to see things around him clean and sanitary. Every man should change his under clothing frequently and have it washed, to get rid of the dirt and sweat soaked up by the vest, drawers and socks. Remember that sweat contains poisonous irritating matters thrown off by the skin. He should never sit in wet clothes but change into dry after rubbing himself down with a rough towel. He should be warned to avoid a "chill on the liver" by wearing a flannel belt at night, to be temperate, to take plenty of exercise, to be careful in his diet, and to keep fit generally.

He should bear in mind that he shares the Barrack-room or tent with a number of others, and therefore any neglect of

sanitary precautions on his part is not only a source of danger to himself but to others.

2. **Barrack room cleanliness.**—In addition to keeping floors, windows, shelves, boxes, tables, forms, etc., clean, impress on men the *absolute necessity for having any amount of clean fresh air to breathe*, and not air which has been breathed over and over again by other men, whereby it has become loaded with poisonous matters thrown off by the lungs.

Officers and Non-Commissioned Officers should make a point of telling their men about this, otherwise they will keep every window, door and ventilator closed, not thinking that by so doing they are breathing over and over again their own and their comrades' impure air. Tell them about the "Black Hole of Calcutta" where 123 out of 146 European prisoners died in 12 hours from want of fresh air, and tell them of the Austrian prison where 260 out of 300 Austrian prisoners of war died in a few hours from the same cause.

Let them know that they get rid of the poisonous products of the body by means of the skin (sweating), the water they pass, the bowels *and* the air they breathe out, and that if they want to keep strong and well they must breathe pure air and not air which has been rendered impure by being breathed before.

Why are men more healthy in camp than in barracks? Because there are no doors and windows to shut, the side of the tents are up as much as possible and men breathe fresh, pure air.

The chief predisposing cause of **consumption** is the breathing of impure air, and every soldier should have it thoroughly impressed on him that the way in which consumption is spread is by means of the expectoration (spittle) from a consumptive man. A man suffering from consumption spits on the floor, the matter he spits out contains the bacilli (germs) of the disease, this spittle dries on the floor, is then blown about the room as dust, and is breathed in by another man in the

room who is run down in health, or otherwise predisposed to the disease, and he gets it. If a medical man is doubtful whether a patient is suffering from consumption or not he examines the patient's expectoration (spittle) under the microscope to see if the tubercle bacillus (microbe of consumption) is present or not. The fact that **consumption is spread by means of the spittle** is now so well-known that in all large towns notices are put in omnibuses, railway carriages, etc., prohibiting spitting; it is a punishable offence in civil life.

How is consumption cured? Chiefly by making the patient live in the pure fresh air as much as possible, sleeping with windows wide open, no matter what the weather.

Breathing impure air also causes sore-throat and renders men much more liable to catch fevers.

Pneumonia is another disease which is frequently caused by bad ventilation. The following instances given to me by Surgeon-General H. Hamilton, C. B., P. M. O., Northern Command, illustrate this.



One battalion of a Gurkha regiment was up in Chitral, doing hard work, and exposed to very trying climatic conditions; the men were restricted to their rations and all had scurvy, but their barracks were built with very free eaves-ventilation all round. This battalion had not a single case of pneumonia, whereas the other battalion, in a warmer climate, doing ordinary work and well fed, but living in small unventilated barracks, had 26 cases.

After the Pindi concentration one of the British regiments returned to its station with an epidemic of pneumonia. It was learned that, to save space and labour, some tents were not pitched, so that the men in the others were very much crowded. On the probable cause of the pneumonia being explained to the Commanding Officer one side of every tent was left open at night, and not another case occurred.

Some time ago an epidemic of pneumonia occurred in Alipore Jail. The Superintendent had every second window removed bodily, and the epidemic ceased as if by magic.

During the Tirah Expedition where the cold was intense and the hardships extreme, especially for the followers who had little clothing and had often to struggle through ice-cold water to their camps at night, there was little or no pneumonia; on the other hand there have been numerous instances of terribly fatal epidemics of pneumonia on the Frontier in peace times when the troops have shut themselves up in their warm, unventilated barracks.

I was told recently of a Frontier regiment in which an epidemic of pneumonia occurred not long ago, there being something like 100 deaths. This epidemic was promptly cut short by taking the men out of the barracks into camp.

Cavalry soldiers should know that their horses also require fresh air; the death-rate among French Cavalry horses was about 185 per 1,000 until they built properly ventilated stables and thus gave the horses plenty of fresh air, since which time it has been about 25 per 1,000 (Munson).

When referring to milk I mentioned the fact that 25 per cent. of stall-fed dairy cows in large towns suffer from consumption, almost entirely due to want of fresh air.

I have dwelt at length on this subject since it is very important that soldiers should be taught the value of fresh air, the danger of shutting all doors, windows and ventilations, and the reason why spitting on the floor should be checked.

**3. Cleanliness of Cook-Houses and everything connected with food.**—Keep flies out of cook-houses, pay special attention to the water, and do not allow it to be conveyed to the cook-house in *mussacks*: see that all cooking utensils are kept scrupulously clean, issue plenty of clean dusters daily, keep natives out of cook-houses as much as possible, keep food covered in wire safes, see that the cooks wear clean clothing and that basins with soap, water and towels are provided for them to wash their hands. Allow no food or refuse to be thrown on the ground around

the cook-house, it should be put into the wet or dry refuse receptacle, as the case may be.

A matter which requires special attention is the washing-up of cooking and eating utensils; knives, forks, plates, etc., should be inspected frequently at unexpected times. It is better not to leave this entirely to natives. Soldiers should do the washing up themselves, or, at any rate, supervise it, and the vessel in which it is done should be frequently cleaned.

These and other details connected with cook-houses are well known to men and require no further mention, and the reasons for the above I have already given when discussing water, flies, infection of food by flies, pollution of ground, etc.

**4. Cleanliness of the camp or ground around barracks.**—Attention to this is of the highest importance; for the reasons I have already given, men should not urinate on the ground in or near camp: no refuse or slops should be thrown on the ground, all stable litter and manure should be thoroughly removed daily, or not



only will the ground become polluted but flies will breed.

With regard to men passing water or motions on the ground in or near camps, they should be told that the enteric fever microbes can live for many days in soil; that this soil, (which has been infected by the water or motion from a man suffering from enteric fever) dries and blows about camp as dust, is inhaled by men run down in health who thus get enteric fever. It has only comparatively recently been shown that enteric fever can be contracted in this manner, and it is distinctly a fact which men should know in order that they may understand the reason for strict orders on the subject. Not only may this infected dust be breathed in by men, but it may pollute water and food. As an instance of the possibility of dust infecting a well, I may quote the rest-camp at Baracao, at the foot of the Murree hills: at this camp drinking water is obtained from a well, which until recently had a wall around it surmounted by a roof,

but the wall had windows in it and these windows were often carelessly left open. Within eighty yards of the well is a flat piece of ground on which mules and transport animals are put. This ground was much polluted by manure and human fæces, for the native drivers, in spite of all orders, urinated and passed motions on the ground; the sun dried the manure, ground and fæces, a strong wind would spring up, and when the windows of the building over the well were left open bits of straw (stable litter) and flakes of horse manure could be seen on the surface of the water in the well. If straw and manure could be blown into the well, so could the fine dust from infected fæces. If the wind should blow from the other direction, it carried this dust over men's dinners! The ground in and around a camp or barracks *must* be kept clean or disease will be the result. All refuse (including stable manure) must be removed to a place specially set aside for the purpose and then burned. This is a point on which particular stress must be laid: burning is the only sanitary way of disposing of refuse.

## CHAPTER XI. THE MOSQUITO AND MALARIA.

Being the cause of much sickness in the army it is worth knowing something about this little gnat. During 1901 there were 18,217 admissions to hospital for malaria (ague) amongst British Troops in India, all due to this pest. The chief causes of disease in the European army in India are venereal disease and ague, causing generally about fifty per cent. of the total sickness.

That the mosquito is the means by which ague is spread from man to man has been most conclusively proved; every detail having been worked out by the microscope, but an account of the following practical experiment may be found interesting. In 1900 the Colonial Office sent Doctors Sambon and Low to Italy to demonstrate, that by protecting themselves from mosquitoes by means of nets they could live in the most malarial part of Italy without contracting ague. This they did, they lived in a hut with gauze doors and windows, in a part of the country where

it would otherwise have been impossible to spend one night even without getting ague. They worked in the fields wet or fine, and did the same as the Italian peasants, *except* that they shut themselves up in their mosquito-proof hut from sunset to sunrise, and slept under mosquito curtains. They took no quinine. All the peasants were attacked with ague, but the Doctors and their servants lived there for three months and remained perfectly healthy.

To further prove the case, mosquitoes were allowed to bite men suffering from ague, and were then sent to England in cages; on reaching London these mosquitoes were allowed to bite two medical men both of whom in a few days were down with ague.

I may add that neither of these medical men had been exposed to, or suffered from, ague before.

**Where mosquitoes come from?**—Mosquitoes lay their eggs on the surface of water, on which the eggs float. These in two days are hatched and become "Larvæ." The larvæ are small (about  $\frac{1}{4}$  inch long),



worm-like animals which swim about just under the surface of the water, because they require air. The larvæ develop into pupæ which float about near the surface of the water. The pupæ-case bursts, and the mosquito, which has during this time been forming, emerges and stands on the empty case until its wings are dry, when it flies away. It takes fourteen days for an egg to develop into a mosquito.

These details are given with the object of impressing on the memory the fact that the mosquito lays its eggs and spends the first part of its existence in water, and that therefore if there are no little pools or collections of water about barracks there will be no place for the mosquitoes to breed.

Or if these collections of water are unavoidable (such as the small cement pits in Officers' compounds), the water in them should be changed once a week; there will then be no time for the eggs to develop into mosquitoes (it takes fourteen days).

It will also be noticed that during this stage of a mosquito's life it floats on or near the surface of water to breathe air; if therefore it cannot get air it dies. It can therefore be destroyed at this stage by pouring kerosine oil over the whole surface of pools of water, thus suffocating it. Two tablespoonsful of oil for every 15 square feet of water-surface is sufficient.

These are therefore the methods by which mosquitoes can be prevented from breeding, or destroyed during the first 14 days of their existence. The importance of this will be understood by reading the following extract from Sir Patric Manson's book on Tropical Diseases: "as each female mosquito may lay eggs many times in a season, and many hundreds of eggs each time, and as the young female can produce eggs within a week or ten days from birth, it follows that one pair of insects can give rise to several millions of the kind in the course of a summer."

It is obvious that any attempt to destroy full-grown mosquitoes in a systematic manner

must result in failure. It is impossible to catch and kill all mosquitoes in or near barracks and cantonments, but when they are in a helpless state, floating on pools of water, it is a different matter, and they can easily be destroyed.

To effect this, mosquito brigades are formed in stations, their duty being to fill up pools and to prevent them from forming by providing good drainage, and so reduce the number of breeding places. Also to put kerosine oil on the surface of collections of water which cannot be drained, to permanently close disused wells, and to see that the small cement pits in barracks or compounds are kept emptied out every week, so that the eggs have not time to hatch out and develop into full-grown mosquitoes. The mosquito brigade should also cut all long grass near barracks so that the damp ground beneath may not form a place for the eggs to be laid in. All collections of water in and near barracks should be looked at to see if they are acting as breeding-grounds for mosquitoes—for instance, fire-buckets may act as such.

But it is impossible, for any reason, to deal with *all* breeding places. One can at any rate prevent as far as possible mosquitoes from becoming infected with the ague-germs.

How can this be done? By not allowing any man who is suffering from ague about barracks; he must be in hospital under mosquito curtains.—If such a man stays in barracks, it must be remembered that his blood is full of ague-germs and that if a mosquito bites him and sucks up some of his blood, and then bites another man, the second man bitten will get ague.

But there are other people in India besides the soldier, and these (natives) may spread the disease, for it is, of course, impossible to see that all natives suffering from ague are sent to hospital.

The only thing that can be done in this respect is to remove the native population as far as possible from barracks, and to warn men against visiting bazars after sunset (*i.e.*, when mosquitoes are about). The natives of the country all, more or less, suffer from ague, especially children under ten years of age, and it is these latter who chiefly spread the disease.



There is still another means of preventing the spread of ague, and that is by **the use of quinine**. It has been found that quinine is a poison to the ague-germ, and if taken by the mouth or injected under the skin it will without fail kill all the ague-germs in the blood. For this reason "Quinine parades" have been established in various malarious stations. Quinine acts as a preventive, so that if the ague-germ is injected by a mosquito bite into a man's blood which contains quinine it will be at once killed.

But of all means for personal protection, **the mosquito curtain** is far and away the best. It should be square, and should not have the smallest hole. Whenever there is a tiny tear in the net a mosquito is sure to make for it at once. This can be seen any day. The mosquito will fly round and round the hole and then make a dive and go through. Hence a torn net is worse than useless, for it will collect mosquitoes inside it. To be of any use the net should be let down before the sun sets, for it is at this time the mosquito begins to wake up: it should be suspended inside the poles and

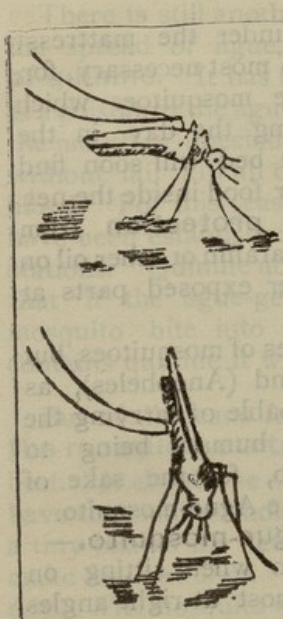
should be tucked in under the mattress. This latter precaution is most necessary, for, if it be not done, those mosquitoes which have been resting during the day in the dark corners under the bed will soon find their way to obtain their food inside the net.

**Another means of protection** from mosquito bites is to rub paraffin or other oil on the hands, face and other exposed parts at night.

There are many species of mosquitoes, but fortunately only one kind (*Anopheles*), as far as we know, is capable of carrying the ague-germs from one human being to another. This mosquito, for the sake of simplicity, we will call the Ague-mosquito.

#### **How to know the Ague-mosquito.—**

(1). The ague-mosquito when sitting on a wall, ceiling, etc., is almost at right angles with the surface on which it is resting, thus appearing to be standing on its head; whereas the harmless mosquito sits in a hump-backed position, its head and body being almost parallel to the surface on which it is sitting, and if the hind legs project upwards they generally are curved backwards, and slowly oscillate to and fro.



Harmless Mosquito.

*Resting Positions.*

Malarial Mosquito.

(2). The wings of the ague-mosquito are generally spotted, while in others wings are generally not spotted.

(3). The ague-mosquito is silent compared with the harmless mosquito which makes a distinct humming noise.

The ague-mosquito as a rule only comes out at night, and those mosquitoes which are seen in the daytime and often bite are generally harmless. They feed almost exclusively at night, especially in the early night and just before dawn. They seldom fly far from the place where they are hatched. The wind may blow them great distances, but they dislike the wind and seek shelter from it, so it is probable that they are not carried far by this means. It follows from this that a belt of trees will act as a screen against the ague-mosquito. They avoid the open spaces to get away from the wind. They are not generally attracted by a light, so most of the gnats flying round a lamp are of a harmless variety. Besides their habit of settling in a shady place, they appear to have a preference to settle on articles of a dark blue



colour, and to avoid anything of a yellow colour. They also prefer to settle on leather, as saddles or boots, the smell appears to attract them.

In the Saddle rooms of British Cavalry Regiments they are usually very plentiful (James).

Ague-mosquitoes sleep during the day in sheds and houses, and are especially to be found in old unoccupied houses, such as the smoke-blackened thatched mud huts of natives. They are seldom seen in a new house with whitened walls, hence the value of white-washing walls and roofs in barracks. In barracks a favourite place for the mosquito is behind dark-colored clothes hanging on the wall or placed on shelves. In the British Cavalry barracks at Rawalpindi this year it was found that the mosquitoes made the roof their home, where they hid and slept during the day. In private houses they hide behind curtains, so the fewer curtains there are in a house the better.

### The prevention of ague in the Field.

A few remarks on this subject are necessary. We know that ague is caused by the bite of a mosquito. To exterminate this is impracticable either in barracks or in the field, neither is it possible to entirely prevent soldiers being bitten by mosquitoes, especially in the field; but the number of bites (and consequently the amount of fever) may be considerably lessened on active service by the following means:--

(a) **The issue of squares of mosquito netting** for use at night; it is very light and would make little difference to a soldier's kit. The Japanese adopted this plan and supplied each officer and soldier in Manchuria with a "head mosquito net," weighing less than 2 ozs., and made on the principle of an opera hat for convenience of carriage. As a result they lessened the number of ague cases from 108 per 1,000 men in the Chino-Japanese War, to less than 2 per 1,000 in the Russo-Japanese War. Native Troops of the Egyptian army are provided with mosquito

netting. It should be part of equipment of every British soldier when proceeding on active service in countries where mosquitoes abound, and should be issued to men going out on such duties as long-distance signalling. To illustrate the importance of this, I may mention that two months ago an instance came to my notice, in which 9 men out of 12 of a British regiment sent out in long-distance signalling, were admitted to hospital on their return suffering from ague. None of these men had had ague before, no mosquito netting was issued to them when they were sent on this detached duty, and on their return they were covered with mosquito bites. They told me that they knew nothing about mosquitoes causing ague; had they known they would have asked for netting before going out.

(b) A precaution of equal value in the field, to the use of netting, and probably more practicable, is **smearing with aromatic oil the parts of the body not covered with clothing**. Mosquitoes dislike aromatic oils such as penny-royal or eucalyptus.

It may be argued that the men would not use the oil if provided, but I think they would if they thoroughly understood that ague is caused by the bite of a mosquito, that the mosquito dislikes strong-smelling oils, and that therefore by using it they would not only avoid getting fever, but would be free from mosquito bites and much discomfort. The small additional transport required for the conveyance of the oil would be more than compensated for by the diminution in the sick rate and the increased comfort of the men.

The following extract from an essay by Lieutenant-Colonel C. W. S. Magrath, R.A.M.C., is of interest:—

"I wish to mention a precaution against ague which, during four years' civil work in Upper Burma, I, personally, found of the greatest value. I allude to the smearing of the exposed parts of the body with aromatic oils, which prevent, or at least discourage, the attacks of mosquitoes. My work took me at all seasons of the year into jungles which were simply poisonous with malaria



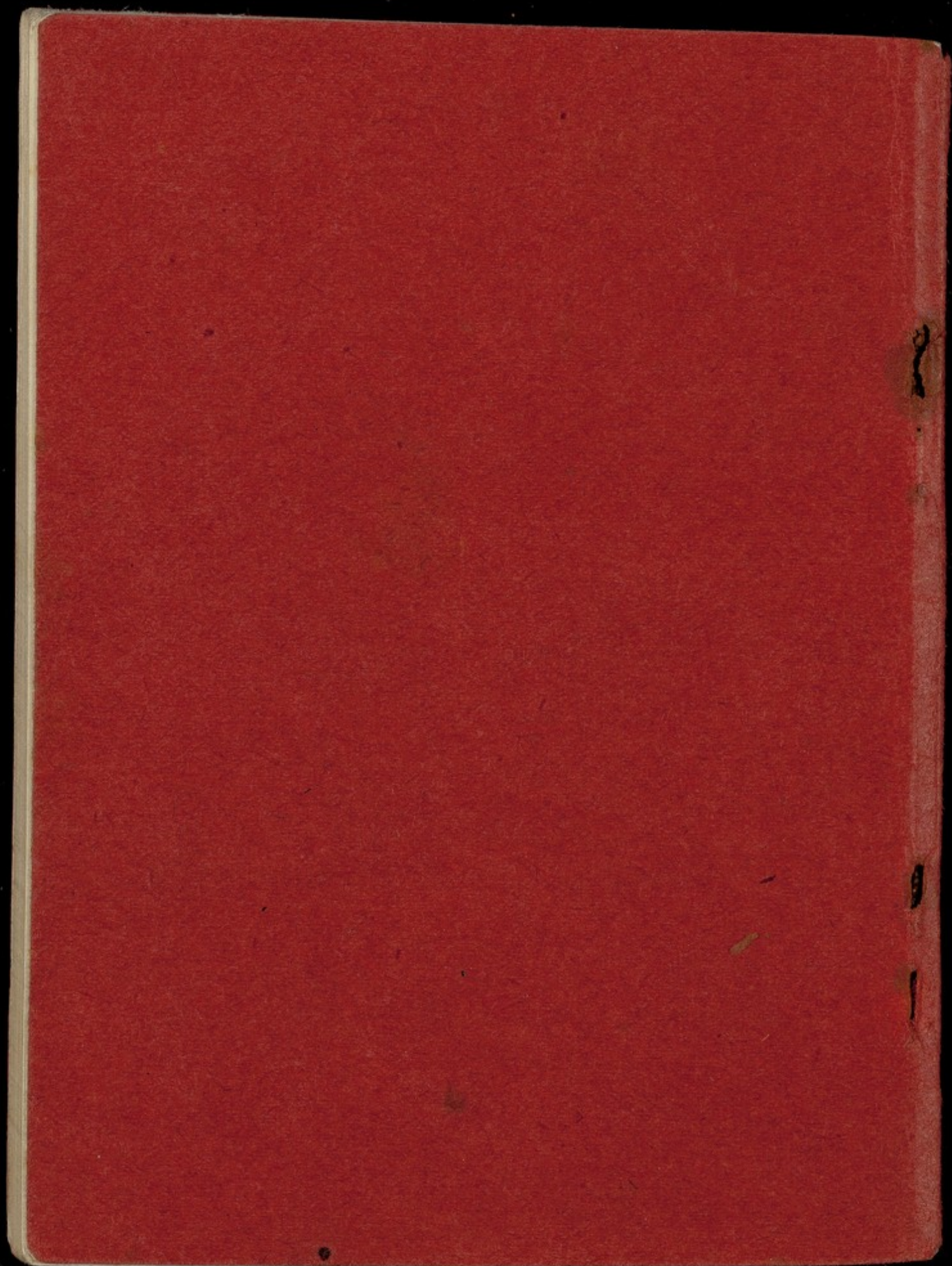
(ague), and all the leave I could obtain was spent in pursuit of big game, which invariably frequents the most malarious localities, and the only attack I got was once when, having forgotten my oil, I was out for two nights."

(c) In camps, fallen leaves or green boughs burnt so that the wind carries the smoke over the men, will keep away mosquitoes. This, like the use of the oil, may not be particularly pleasant, but anything within reason is better than getting ague. Remember that when once a man gets ague, it is not a question of one attack, but probably of many, for he is liable to get fever at any time, especially if he gets a chill.

(d) Pools and other collections of water where mosquitoes can breed should be filled up or drained if the camping ground is likely to be occupied for any length of time.

(e) Rugs should be hung over doors of houses occupied, and fine gauze nailed to the frame work of windows to keep out mosquitoes.





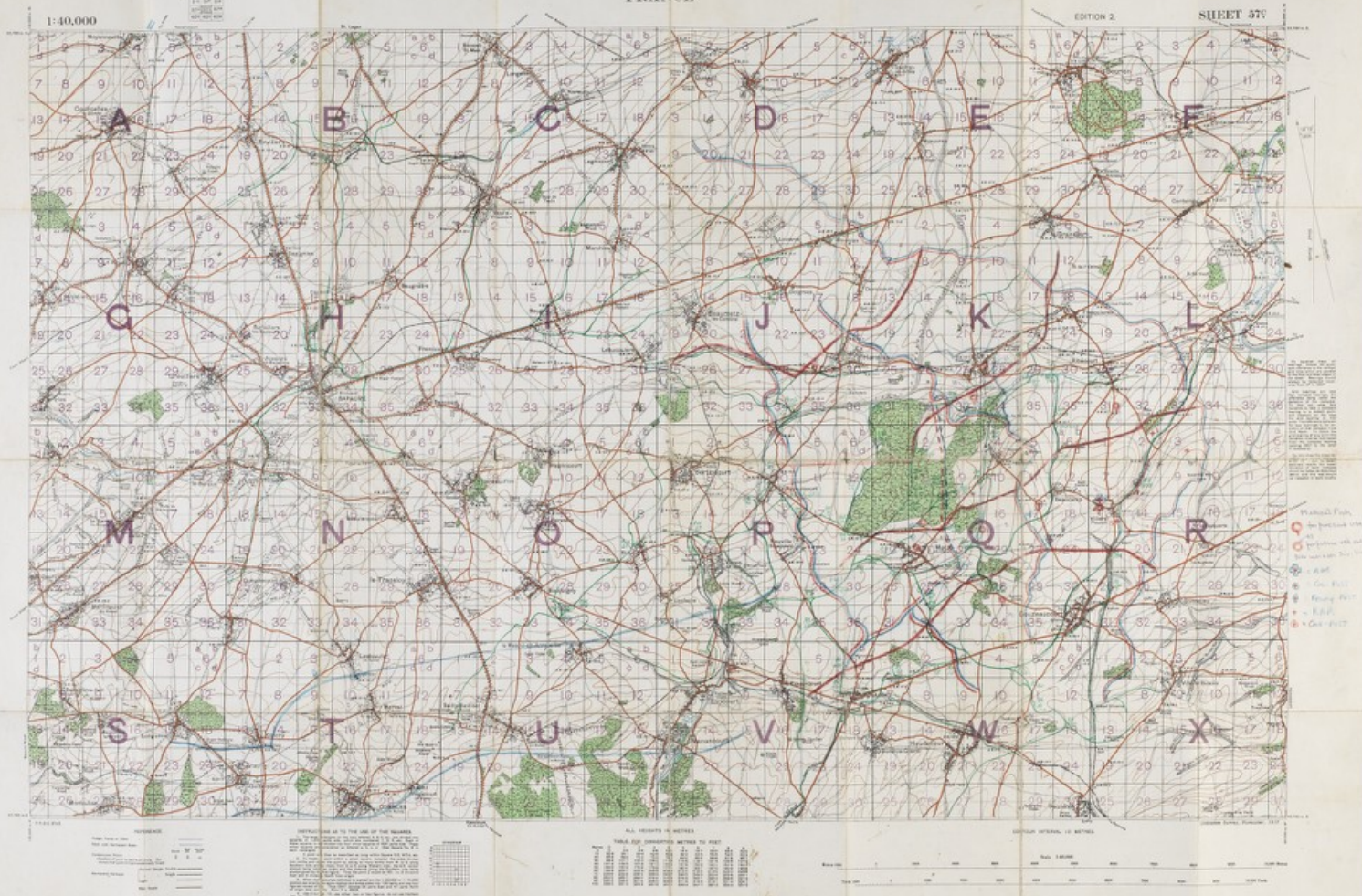


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*Gilbert*

FRANCE.

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EDITION 2

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