obtained a considerably higher proportion of men with 0/5—7% in even his best group. This discrepancy is probably mainly due to difference in technique, and emphasizes the advantage of the viewing-screen over goggles. In spite of constant attention the latter become fogged and are a source of error.

The chief interest of this series of results is the illustration it gives of the downward trend of scotopic vision which occurs with advancing years. According to these results the drop begins before the age of 18. Since, however, the drop from the average at 18 to that at about 44 is only in the region of 3 μ ml., this point is of theoretical rather than of practical importance.

Summary

The brightness figures of the Army night-vision test are given, with a qualifying remark on the colour of the light in adaptometers. Though the test is one of form sense it appears that the minimum light necessary for the discrimination of a simple form is in the region of the absolute light threshold.

The results are recorded of 10,333 tests, the subjects of which were high-category men between the ages of 18 and 55. They illustrate the downward trend of scotopic vision which occurs with advancing years.

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REFERENCES

- Craik, K. J. W. (1943). *British Medical Journal*, 1, 632.
Duke-Elder, Sir W. S. (1942). *Text Book of Ophthalmology*, 1, 903.
Rycroft, B. W. (1942). *British Medical Journal*, 2, 576.
Steadman, B. St. J. (1943). *J. R.A.M.C.*, 80, 73.

FILARIASIS IN THE MIDDLE EAST

BY

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AND

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It is not unusual to meet with cases of clinical filariasis among African native troops in the Middle East, and one of us (J. F.) has seen them in all three hospitals to which he was temporarily attached.

In view of the high incidence of microfilariaemia among natives in certain regions of Africa reported in the literature, it was considered of interest to carry out a routine examination of the blood of all negro patients in the wards of a general hospital, irrespective of the condition for which they were admitted. At the same time information was obtained of the country of origin in each case and the period that had elapsed since they left their homes: in practice this period corresponded to the time of enlistment. The findings are shown in Table I.

An inspection of the table revealed that: (1) 12 cases (29%) out of 42 showed the presence of microfilariae; (2) 30 out of the 42 patients came from Uganda, and all the positives were in this group—i.e., Uganda soldiers showed 40% infestation with filaria; (3) of the 12 cases of filariaemia only two had clinical filariasis; (4) the patients with filariaemia had left Uganda from 10 months to 2 years and 8 months previously.

An attempt was made to determine the species of filaria present by doing relative counts morning and evening. The results appear in Table II, the number of filaria recorded being the total found in an entire uniform wet film.

It is clearly impossible to infer the species in more than three cases in this series: of these three one was *L. loa*, the other two *W. bancrofti*. Unfortunately there was no opportunity of continuing the investigation to determine the diagnosis by more frequent counts or by staining methods.

One point of interest that emerges is the large number of instances (10) in which only one larva was present in an entire wet film. In those cases an average of 15 minutes elapsed before the larva was found, and it is not unlikely that a less leisurely examination would have yielded more negative results: five such negative results were in fact reported by a laboratory assistant whose speedy disposal of 20 films (in about 50 minutes) roused suspicions as to the reliability of his findings. In view of the number of films with only one larva in the entire specimen it seems probable that some of the negative results

might have been positive if a greater volume of blood was examined, or if a concentration method was used at which a quantity of blood was haemolysed and a centrifuged deposit examined. The use of thick films, dehaemoglobinized and stained, should also increase the number of positives in a filarial survey.

TABLE I

No.	Ag	Country of Origin	Years since leaving Home	Presence of Microfilaria in Blood	Clinical Diagnosis
1	36	S.W. Africa	18/12	—	Corneal ulcer
2	25	Uganda	10/12	—	Inf. hepatitis
3	37	"	15/12	—	Sciatica
4	20	"	15/12	—	N.Y.D. headache
5	22	"	11/12	—	Herpes zoster
6	21	"	1	—	Lobar pneumonia
7	20	"	15/12	—	"
8	26	"	15/12	—	Clin. malaria
9	21	"	11/12	—	"
10	24	"	15/12	+	Pneumonia (conv.)
11	21	"	15/12	+	Filariasis
12	25	"	11/12	—	Pneumonia (conv.)
13	24	"	2	—	N.Y.D. haemoptysis
14	18	"	10/12	+	Pneumonia (conv.)
15	20	"	2	—	Taenia infest.
16	25	"	32/12	+	Inf. hepatitis
17	19	Kenya	11/12	—	Taenia infest.
18	22	Uganda	1	+	Cellulitis
19	20	"	15/12	—	Arthritis
20	25	"	11/12	—	Clin. malaria
21	21	"	2	+	Filariasis
22	22	Kenya	1	—	Diarrhoea N.Y.D.
23	26	"	2	—	Dysentery N.Y.D.
24	23	Uganda	11/12	—	"
25	18	"	9/12	—	"
26	42	"	15/12	+	Shiga dysentery
27	33	"	3	—	Dysentery N.Y.D.
28	20	"	21/12	+	Inf. hepatitis
29	25	Seychelles	5/12	—	Dysentery N.Y.D.
30	23	Tanganyika	1	—	Ankylostomiasis
31	23	Swaziland	1	—	Schistosomiasis
32	25	Uganda	15/12	+	Arthritis
33	25	"	15/12	+	Bronchiectasis
34	22	"	10/12	+	? Tb. chest
35	25	Kenya	13/12	—	Bursitis shoulder
36	23	Uganda	11/12	—	Mumps
37	19	Uganda	10/12	—	Pneumonia (conv.)
38	42	Bechuanaland	15/12	—	Cataract
39	30	Uganda	8/12	—	"
40	20	Kenya	1	—	Dysentery N.Y.D.
41	25	"	25/12	—	"
42	20	Uganda	1	+	"

The transmission of filariasis is by a wide range of insects. Manson-Bahr instances 24 species of mosquito capable of transmitting *W. bancrofti*, and these include 8 culicines, 11 anophelines, 3 aedes, and 2 mansonioides: among those are *Culex fatigans*, transmitted by mangrove-flies only (*Chrysops*), while the intermediate hosts of *A. perstans* are limited to the midge genus *Culicoides*. It is clear, therefore, that malarious areas such as occur in the Middle East are likely to favour the dissemination of *W. bancrofti* infection, and, even though the incidence of clinical filariasis is not high among infested individuals, it does not seem desirable to expose non-filarial

TABLE II

No. of Case	Original Serial No.	Filaria Count		Species Present
		9 a.m.	9 p.m.	
1	10	3	3	?
2	11	1	38	W. bancrofti
3	14	1	1	?
4	16	1	0	?
5	18	1	0	?
6	21	20	0	L. loa
7	26	1	14	W. bancrofti
8	28	5	2	?
9	32	1	0	?
10	33	1	0	?
11	34	1	1	?
12	42	1	2	?

districts to the consequences of introducing heavily infested bodies of troops such as the Uganda natives.

The scope of the present investigation is admittedly too limited to justify any sweeping recommendations such as the cessation of recruiting in endemic filarial areas of Africa. Nevertheless it does seem desirable to introduce a routine blood-film examination for natives in such areas and to assign infected cases for local duty only. Whatever precautions might be taken with infected troops (segregation, mosquito netting), the great length of time, extending into years, during which filariae are present in the blood stream renders the probability of eventual dissemination one of definite proportions.

Summary

Forty-two sick African native soldiers in a Palestine general hospital were examined for microfilaria and 12 positives were obtained.

Thirty out of the total came from Uganda, and all the infected cases were in this group.

Only two of the positives were cases of clinical filariasis, but it did not seem very likely (though this has by no means been established) that the conditions from which the other ten cases suffered had any relation to the filariaemia.

Most of the infected men had left their homes over a year ago, and in some cases over 2 years before; filariaemia must therefore have persisted for long periods, and must be regarded as capable of persisting still further.

Pending fuller investigations it is suggested that natives in known infested areas should not be recruited for service abroad unless the blood is found to be filaria-free.

THE DETERMINATION OF HAEMATOCRIT VALUES IN WOUND SHOCK

A ROUTINE PROCEDURE

BY

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In the course of certain experimental work it became necessary to devise means of determining the haematocrit value of many blood specimens simultaneously and with the utmost speed. Our requirements were met very simply by (1) the use of thin-walled capillary tubes; (2) millimetre paper; (3) a specially constructed fixed-angle microcentrifuge slotted to hold 25 capillary blood specimens. This apparatus allowed the haematocrit value of the blood from several cases at one time to be determined with accuracy and with such unusual expedition that we feel justified in describing our technique in detail.

Method

The capillary tubing is drawn out and cut into approximate lengths of 60 mm.; from each specimen heparinized blood (small droplet of blood on finger dusted with heparin before pricking) is filled into 8 to 10 such tubes by capillary attraction.

These are then quickly sealed at the uncontaminated end in a spirit flame—taking care not to heat the blood—fitted into numbered grooves in the special centrifuge, and spun. Since the rate of spin depends on the motor power available for connexion to the instrument, the higher the rate of spin the shorter need be its duration. The capillary tubes may be removed as soon as the solid constituents of the blood are

spun out, and the reading is made by checking the fluid-solid level against millimetre paper. The resultant average of all samples of each blood specimen is expressed, as usual, as the percentage of corpuscles in a total blood volume.

The body of the centrifuge (see Fig.) is a truncated cone with a top diameter of 3 in. and a bottom diameter of 6 in., the external surface being at an angle of 45 degrees with the base. The sets of capillary tubes slide into grooves cut from top to bottom of the external surface parallel to its inclination, and are retained by three narrow bands running round the outside of the cone at intervals of about 20 mm. between base and top. Underneath, and turned as part of the cone, is a horizontal pulley-drive. The entire head is mounted on a vertical 1/2-in. steel rotating shaft. The shaft is fixed on a universal clamp so that the apparatus can be secured firmly on a table, metal framework, rod, or other platform sufficiently robust. The centrifuge head can be constructed of light metal or some lighter material, so that no great driving power will be needed. A small electric motor is adequate, or the power provided by the fan belt of a motor-car or similar engine. In practice it has been found quite satisfactory to drive the centrifuge by pressing the lower rim against the upper outer side of the tyre of a jacked-up rear wheel of a motor-car. It might be more convenient to interpose a small driving wheel and flexible shaft of speedometer type. In cases where the r.p.m. are low a step-up pulley could be easily interposed between motor and centrifuge to raise the gear ratio so as to yield about 3,000 to 4,000 revolutions a minute. Where such fittings are lacking or the available centrifuge-mounting is not firm enough to allow such a high rate of spin, satisfactory results can be obtained with as few as 1,000 revolutions a minute; but in this event the tubes must be spun for a longer time. The lowest optimal time for every individual connexion can be found once for all by the initial inspection at test intervals of a set of control tubes. When the solid-fluid level ceases to alter, the end-point has been reached. The spinning time so determined will be approximately correct for all subsequent readings under the same conditions. No harm is done by considerable prolongation of the spinning time, where it may be convenient so to do. The usual precautions taken with other types of centrifuge in regard to their slowing gradually to rest without disturbing the content of the tubes should also be observed here. Where a drive is provided by a car engine the r.p.m. should be reduced by gradual deceleration.

This simple centrifuge has proved so useful in the laboratory that its use may be suggested as an aid to clinical differential diagnosis in surgical emergencies.

Comment

Modern investigations in the mechanism of production of shock in the injured have shown that in primary shock the collapse is due to vasomotor failure; the composition of the circulating blood is unaltered and transfusion of blood or plasma is not indicated: it may even overload an already impaired circulatory system. The haematocrit readings will be within the normal range of values. In secondary shock the haematocrit readings will be abnormally high owing to loss of fluid elements of the blood; the percentage of solids in any given blood volume will be in considerable excess of normal. If secondary shock is still developing and not yet extreme the patient is still conscious, but the underlying progressive blood change is already revealed by a moderately raised haematocrit reading.

Haemoconcentration has been found to be the earliest sign of oncoming shock in wounded soldiers (Moon, 1942).

Transfusion of plasma, though an appropriate treatment for all degrees of secondary shock, can confer only temporary benefit if the excessive capillary permeability persists (that has allowed the migration of fluid constituents of blood), and the transfused plasma also escapes. It has been found, as in the case of burn shock reported among others by Rhoads (1941), that adrenal cortex hormones (cortin) are capable of preventing the persistent fluid loss by reducing capillary permeability, thereby saving much plasma. Dehydration shock experiments