SOME WAR TIME STATISTICS*

BY

G. C. DANSEY-BROWNING

LIEUT.-COL., R.A.M.C.

THE recent publication of a Statistical Report on the Health of the Army from 1943 to 1945¹ has provided the military ophthalmologist with a wealth of information. This work presents some of the ophthalmic problems peculiar to troops stationed in the United Kingdom, and outlines some of those encountered during the campaigns of Europe and Africa. At first sight such statistics would appear to have only a limited value in this atomic age, but it must be remembered that the basic morbidity rates for ophthalmic disease amongst British soldiers will remain virtually unaltered in all future wars. Atom bombs, on the other hand, will affect the casualty rates considerably, and may even align the figures for ophthalmic injury in the 1939-1945 war with those of campaigns of a bow-and-arrow era.

European armies by 1939 had achieved only relatively slight increase in efficacy of the explosives and projectiles used, compared with those employed in the wars of the previous half-century. Thus the histories of these conflicts gave the military oculist some rule-of-thumb data to go by. Some two-and-a-half per cent. of the total battle casualties would thus be expected to have sustained wounds of the eye and orbit. If, however, wounds of the head and neck region were aggregated, these might even prove responsible for up to ten per cent. of the injured that were evacuated from the battle-field. The ophthalmologist expected, and indeed soon learned by his own experience that, if a soldier were to be hospitalised for any ophthalmic lesion, then that man's unit would be lucky if it received him back under a month. It would be suspected that ophthalmic disease was only responsible for about one per cent. of the total sickness amongst British troops in most parts of the world, and the ophthalmologist would find that about five per cent. of the personnel of a fighting division and from ten to fifteen per cent. of personnel of the L. of C. troops would need spectacles to render them militarily efficient. It is interesting to compare these pre-conceptions with the figures for disease and injury given by statisticians.

OPHTHALMIC MORBIDITY IN THE UNITED KINGDOM

The report provides us with the startling generalisation that the overall sickness rate in the United Kingdom during 1943 was such

* Date submitted for publication, May 27, 1949

that every soldier might well have spent one day of that year in reception stations, and eleven days in hospital or convalescent depots. It is interesting to note that two-thirds of all the military cases of ophthalmic disease were treated in the Army's own hospitals, while the other third were treated in civilian hospitals under the Emergency Medical Scheme. Cases suffering from eye disease in 1943 comprised some two per cent. of the population of military hospitals.

The relative casualty rate — that is, the percentage of eye disease amongst all persons lying in hospitals either for reason of sickness or injury — proved to be 1·4 for all male other ranks and 0·8 for members of the Army women's services (A.T.S.). On exclusion of the persons in hospital because of injury, we obtain the relative morbidity rate for ophthalmic disease, and this worked out as 1·0 per cent. for the male other ranks, and remained, as might be expected, at 0·8 per cent. for the A.T.S. The mean duration of stay in hospital for cases of eye disease was found to average out as 28·4 days for male other ranks and 24·3 days for the A.T.S.

OPHTHALMIC MORBIDITY IN THE MIDDLE EAST

Since the days of the Bible the history of war in the Middle East has abounded with descriptions of epidemics of the ophthalmias amongst the armies engaged. The following figures are therefore particularly instructive: The relative casualty rate in 1943 amongst hospitalised other ranks was 1·87 per cent. for ophthalmic lesions. This was therefore only an increase of approximately a third above those hospitalised in the United Kingdom. The relative casualty rate for the officer hospital population proved only to be 0·72 per cent.

Further analysis in the report showed that conjunctivitis accounted for 0·74 per cent. in 1943 and 0·73 per cent. in 1944 of all lesions amongst the other rank hospital population. The diagnosis of keratitis in 1943 covered 0·50 per cent. of all lesions and in 1944 some 0·49 per cent. The officer hospital population suffered far less from conjunctivitis or keratitis. Thus the conjunctivitis incidence in 1943 amongst officers was 0·29 per cent. of the total lesions and keratitis 0·25 per cent. In 1944 the morbidity rate was 0·25 per cent. for conjunctivitis and 0·19 per cent. for keratitis.

The Middle East ceased to be the theatre of large scale operations in the autumn of 1943, and the consequent lessening of urgency in the need to return men to the front is reflected in the increased time that eye cases now spent in hospital. The average time in hospital for the conjunctivitis cases rose from 18·6 days in 1943 to 22·5 days in 1944, and for the keratitis cases from 27·9 days in 1943 to 32·9 days in 1944. The Middle East Force at this time was a polygot army,

and some interest lies in the variety in the incidence of ophthalmic lesions amongst troops of different races. The relative casualty rate for United Kingdom troops with ophthalmic disease in hospital worked out at 1·6 per cent. for Dominion troops at 1·8 per cent. for British African troops at 1·7 per cent. whilst for Indian troops it was 5·6 per cent. That the Indian troops were thus badly affected was probably due to the fact that since 1930 recruiting regulations had been relaxed to permit of the enlistment of men with "healed trachoma." The incidence of trachoma amongst Indian troops is held by some authorities to be almost one hundred per cent.

SEASONAL INCIDENCE OF CONJUNCTIVITIS AND KERATITIS IN THE MIDDLE EAST

This portion of the earth's surface is regularly plagued at certain times of the year with heat, dust and flies. The two graphs show that the highest incidence of conjunctivitis and keratitis do not directly coincide with the main "Khamseen" and fly-breeding

ONE HUNDRED CASES OF CONJUNCTIVITIS

FIG. 1.

periods. Among the various units the R.A.O.C. suffered most from conjunctivitis. This was to be expected from the nature of their duties, of necessity carried out with little protection from the elements in large sandy Ordnance Depots.

ONE HUNDRED CASES OF KERATITIS

FIG. 2.

OPHTHALMIC MORBIDITY IN THE CENTRAL
MEDITERRANEAN FORCE

The report divides the ophthalmic lesions incurred in this theatre of war into 49.9 per cent. conjunctivitis, 25.5 per cent. keratitis, and other ophthalmic disease 24.6 per cent. The relative casualty rate in 1944 was worked out at 1.1 per cent. for other ranks, and 0.4 per cent. for officers. During the whole period under review the C.M. Force was engaged in active operations against the enemy in Italy. The mean duration of stay in hospital proved to be 22.4 days, ranging from an average of 18.7 days for the conjunctivitis cases to 30.1 days for those of keratitis.

DISCHARGES FROM THE ARMY

Men suffering from intractable ophthalmic lesions or with vision below the requisite standards for service were generally made to take their discharge from the Army in the United Kingdom. Thus during 1943 cases of eye diseases constituted some 2.2 per cent. of the total discharges from the Army for sickness or for injury. In 1944 this percentage had fallen to 1.55 per cent., and again in 1945 to 1.15 per cent. Corresponding figures for the A.T.S. worked out at 1.4 per cent. in 1943, 0.9 per cent. in 1944 and 0.7 per cent. in 1945. Thus the effects of lowering the minimal visual standards in the last years of the war are reflected in the change in these

figures. From another standpoint it can be said that, for every 100,000 male other ranks in the Army in 1943, some 48·3 had to be discharged for "eye-disease." In 1944 this had fallen to 39·4 per 100,000, but there was a slight rise again in 1945 to 40·6 men per 100,000 due to shrinkage of the army at the end of hostilities. An equal strength of A.T.S. would have lost 28·6 women in 1943, falling to 18·6 in 1944 and showing a very minor increase to 18·7 in 1945.

INVALIDING DISABILITIES AMONGST PRISONERS OF WAR

The recording of invaliding disabilities amongst prisoners of war, and especially those returned from the Far East, showed up one real difficulty in the application of statistical methods to medicine. The problem lies in the separation of the so-called primary and secondary invaliding disabilities. For example a P/W from the Far East had often contracted malaria, dysentery, beri-beri and an "optic neuritis." The invaliding medical officer would therefore have some difficulty in recording what constituted the "primary" disabilities, when his examination took place some years after the onset of these several diseases. Thus the allocation of the primary disability often became merely an expression of the medical officer's personal opinion derived from a vague clinical history.

In the statistical report the term "optical neuritis" was made to include retro-bulbar neuritis and optic atrophy. Other ophthalmic evidence of nutritional amblyopia was duly recorded as "defects of the field of vision." So the recorded primary disabilities amongst Far Eastern Ps./W. gave some 5½ per cent. as having incurred optic neuritis and a further 2 per cent. as showing defects of the field of vision. As soon as the secondary disabilities were taken into account, then the percentage of those discharged with either optic neuritis or defects of the field of vision rose to 11 per cent. of the total. There is an interesting comment that, at the time of their discharge from the Army, 25 per cent. of the men still showed effects of nutritional deficiency.

The following table gives an excellent comparison of the discharge rates for primary disabilities of the eyes.

<i>Diagnosis</i>	<i>Non-Prisoners</i>	<i>P.s/W. Europe</i>	<i>P.s/W. Far East</i>
Defects of the			
Field of Vision	0·3 per cent.	0·2 per cent.	2·0 per cent.
Optic Neuritis	0·1 per cent.	0·1 per cent.	5·6 per cent.

OPHTHALMIC BATTLE-CASUALTIES AND BATTLE-ACCIDENTS

The term battle-casualties is in common usage, but the term battle-accident may require some elaboration. It is employed to categorise the men who are indirectly injured by the enemy. Thus

the man may have sprung a booby-trap laid by the enemy some months before; or, for example, by the faulty handling of his own weapons in the field, the soldier may have detonated his own hand-grenades, although not in the presence of the enemy. "Battle-accident" therefore covers most of the accidents which might happen to the soldier as he carries out his calling in the field, except those caused by wilful negligence.

The report includes interesting statistics mainly obtained from the records of the North African campaigns. In that fighting, the rôle of the specialist surgical units in the field was such that, from their returns, it was possible to make a classification of wounds on an approximately anatomical basis of sites of injury. In the Normandy landings, a regional classification for wounds came into use in the place of the Neuro-surgical, Facio-Maxillary, Ophthalmic, etc., method used in the earlier campaigns. This regional method is probably the most logical way to record casualties, because wounds are often multiple, and their distribution often crosses the anatomical lines of demarcation, but, as will be seen later, figures obtained from casualties suffering from wounds of the head and neck region are unsatisfactory when the types of wounds of the eye have to be discussed.

The North African casualties were analysed for three separate two-month periods of intensive battle-fighting as under:—

<i>Battle</i>	<i>Period</i>	<i>Army Engaged</i>
Knightsbridge	May-June, 1942	VIII Army
El Alamein II	Oct.-Nov., 1942	VIII Army
Tunisia	Dec., 1942-Jan., 1943	I Army

In the three battle-periods above, wounds of the head, face or eyes were responsible for 12-17 per cent. of the total casualties.

<i>Battle</i>	<i>Neuro-surgical cases</i>	<i>Facio-Maxillary cases</i>	<i>Ophthalmic cases</i>
Knightsbridge	5.3 per cent.	4.3 per cent.	2.2 per cent.
El Alamein II	4.9 per cent.	7.0 per cent.	2.7 per cent.
Tunisia	9.5 per cent.	5.5 per cent.	1.6 per cent.

There were many casualties during all these three periods not strictly due to direct enemy action, *i.e.*, as later described, "battle-accidents." Thus some fifty per cent. of the Knightsbridge cases were battle-accidents forty-five per cent. at El Alamein II, and forty-eight per cent. in Tunisia.

When the casualties from the June-July Normandy landings in

1944 were analysed, the report states that only 15 per cent. of the campaign injuries were held not to be due to direct enemy action. Considering that a large proportion of the troops in the spearhead of the attack were the same men who had participated in the Middle East campaigns, it would seem that this point merely emphasizes the more generous method of recording a man's injuries.

The fighting troops in the North African campaigns were generally carried into battle in armoured or unarmoured petrol-driven vehicles. When hit in a vital part these vehicles would "brew-up," as the current expression described it. Therefore among the ophthalmic casualties there would be a large number of burns of the globe and adnexa. Among the total ophthalmic casualties at the Knightsbridge battle there were 5.1 per cent. burns cases, at El Alamein II some 4.8 per cent. and in Tunisia (where there were many tank casualties) some 7.7 per cent.

The report states that a very high proportion of the ophthalmic casualties were eventually returned to duty in the same theatre of operations. Thus from the Knightsbridge battle some 79.7 per cent. from El Alamein II some 77 per cent. and from the Tunisia fighting 66.7 per cent. were returned to duty in North Africa. Such figures, however, must be treated with caution, as they do not give any indication of the man's final visual efficiency, nor of the employments for which he was finally fit. For example, most of the North African theatre oculists will agree that very few infantrymen who had sustained a penetrating wound of the globe were ever fit for front-line service again, although they might be employable at the base, or on the lines of communication.

The report also makes mention of the remarkable consistency in distribution of the wounds of different parts of the body in all four campaigns. In Normandy some twelve per cent. of the total casualties were found to have suffered from wounds of the head and neck region. Of these, some 13.7 per cent. were *lethal*, death occurring during evacuation through medical units; 21.6 per cent. were *severe*, and prolonged hospitalisation of the men resulted; 42.3 per cent. were *medium*, and in these cases only short hospitalisation was necessary; 22.4 per cent. were *trivial*, so that, after treatment in the forward medical units, the men were returned to their units.

Single as opposed to multiple wounds of the head and neck region were grouped in the report as superficial 10.4 per cent.; flesh 70.9 per cent.; bone 12.6 per cent.; and burns 3.3 per cent., while concussion was only 2.7 per cent. This emphatically did not tally with the experience of most ophthalmologists, who accepted that eye-wounds due to blast as opposed to those from direct trauma by a projectile might form up to forty per cent. of the injuries of the

globe. Here is an instance in which the regional method of wound classification has its limitations.

It was interesting to read that the infantry sustained up to 80 per cent. of the mortar wounds but only some 50 per cent. of the mine wounds. The supporting troops were affected most by mine or bomb wounds, and it was also notable that half the wounded artillery men had been injured by the enemy's counter-battery fire.

SPECTACLES AND THE SOLDIER

As long ago as 1915, when the general introduction of spectacles into the Army was being carried out, it was estimated that five per cent. of every fighting division would need spectacles to make them militarily effective. This estimate was found valuable in the recent war. Some American statistics in respect of their draft (recruits) published in 1944 showed that 5.5 per cent. of the men enlisted had vision in the one eye of 6/18 or less². A survey of British recruits in 1946/1947 gave a figure of 8.8 per cent. of the recruit intake as having vision of 6/18 or less in one eye³. Recently when recruits for the line of communication troops were examined, out of some eight thousand men some fifteen per cent. were found to need glasses. These would be men of slightly lower physical capacity than the fighting troops in a division. Under the Pulheems system of classification, wherein ophthalmic lesions give alteration of the P. rating (Physique), some 5 per cent. of these men were below P.2 (the normal). 298 men were placed in the P.3 rating, which is the "strabismus" rating.

Summary

(1) The figures for ophthalmic injury and disease quoted in the Statistical Report on the Health of the Army, 1943-45, agree in the main with the expectations of military ophthalmologists.

(2) The ophthalmic morbidity amongst the soldier population at home and abroad will not markedly alter in future wars, and it is to be hoped that statistics of this nature will not have been forgotten by the time of the next conflict.

REFERENCES

1. A Statistical Report on the Health of the Army, 1943-45, W.O., No. 5414 published by H.M. Stationery Office, 1948.
 2. THEODORE, JOHNSON, MILLS and BONSER (1944).—*Arch. Ophthalm.*, 31, 399.
 3. DANSEY-BROWNING, G. C. (1947).—*Brit. Jl. Ophthalm.*, 31, 513.
-