

## OPHTHALMOLOGY

THE organisation of an army ophthalmic service belongs to the administrative section of a medical history, but the various advances made may be referred to here, as they were due to clinical experience under military conditions. An ophthalmic surgeon was attached to each Australian general hospital, but the bulk of the work, especially the estimation of refractions, demonstrated the necessity for establishing ophthalmic departments.

When the 2/1st A.G.H. was established in Palestine with the 16th Brigade, the work developed along the lines of a civilian hospital. Equipment for making spectacles in a workshop within the hospital was needed, and in January 1942 Major C. Morlet was empowered to purchase in Cairo this equipment, which later became standard. Three such workshops were working and almost completely equipped when the A.I.F. returned to Australia, and others were likewise established in Australia. The amount of refractive work done was astonishing. At the 2/1st A.G.H., in seven months in 1940, 791 men had their eyes tested for refractive error and 489 needed glasses, and at the end of a year, 1,140 pairs of glasses had been ordered. During the siege of Tobruk Major Morlet recorded that of 300 prescriptions sent to Egypt, only 67 pairs of glasses were returned. Since the only contact with the outside world was by destroyer, which ran the gauntlet of an air attack, it is remarkable that any were received at all.

The existing facilities in Palestine for obtaining spectacles in quantity were poor; frames were unsatisfactory and allowed rotation of cylinders, even when of an army pattern. Later a standard army spectacles frame (Australian pattern A.P. 43) was adopted. Some curious minor difficulties occurred with frames. Metal frames treated with nickel occasionally caused dermatitis, and some non-metallic frames were dissolved by mosquito repellent.

At the beginning of the war the visual standards for recruits of the A.I.F. were those laid down in 1938. These conformed to the old classification of class I and class II recruits, the former fit for active service with field formations. Later, modifications were made when the classifications of physical fitness were altered. Details of the earlier visual standards and their modifications may be found in Volume II. The final standard adopted in 1945, was designed to cover all requirements and not be too complicated for general application. This was as follows:

- Class A1 (a) Unaided vision 6/18 with each eye or 6/12 with one eye and 6/36 with the other.
- (b) If wearing glasses vision 6/9 each eye provided that unaided vision is 6/24 with one eye and 6/60 with the other, or 6/12 with one eye if the other is less than 6/60.

- Class A2 Unaided vision 6/24 one eye, 6/60 in the other, with 6/12 in one eye if the other is less than 6/60 or sightless. The vision of one eye must be correctable to 6/9 by glasses.
- Class B2 Unaided vision less than A2, provided that glasses improve one eye to 6/12 or each eye to 6/18.

In the early days of recruiting some of the eye examinations were not satisfactory, owing to lack of staff and facilities. Several men with an artificial eye actually succeeded in passing a hurried examination. Later, eye tests were usually made by one medical officer only, who supervised the whole examination personally, and the services of a consultant were readily obtainable. In 1945, all recruits were examined by an ophthalmologist before enlistment and where the vision was lower than 6/12 the condition causing the defect was entered on AAF D1. No recruit with a progressive lesion was accepted for service. A note was made in the soldier's record of service book if he was sightless in one eye, and if the vision was below A1 standard, the record service book read "vision unfit for M.T. driving".

Learners in ophthalmology who were specially interested in this work were approved in the latter stages of the war. They were attached to a civilian eye hospital for six months, and to a base military hospital for a further six months, and were then posted to an army general hospital. An adviser in ophthalmology was appointed, and later a consultant attached to the general headquarters in Melbourne, who directed the work of this branch of the medical services.

Another important advance in the ophthalmological branch of the medical services was the creation of an establishment for commissioned officer optometrists. At the outbreak of war most of them served in fighting formations as privates. Some served in hospitals with the rank of sergeant, and assisted the ophthalmologist and in refractions and other routine work. In 1942, with the setting up of optical workshops in general hospitals, a lieutenant optometrist became an integral part of this organisation, with specialised duties.

#### AFFECTIONS OF VISION

Standards were the subject of a good deal of argument during the war, particularly when military conditions were changing. Difficulty was occasionally found in placing individuals accurately. At the end of the war when nutritional amblyopia was commonly seen among prisoners of war, it was evident that the presence of scotomata could handicap a man functionally, even in an emmetropic eye, more than a considerable refractive error. This subject is dealt with below.

With regard to refractive errors, care was taken not to prescribe spectacles for minor aberrations. A technical instruction directed the attention of medical officers to the great shortage of optical material and pointed out that spectacles were to be prescribed only for the efficient performance of duty or for relief of symptoms due to refractive error. Men of the 1939-1945 war appeared to be more "eye conscious" than those of

1914-1918, and their zeal in having small errors investigated took up much of the ophthalmologist's time. The number of presbyopics was also considerable. In the brilliant light of Palestine it was found that eye discomfort and headache were often associated with a refractive error, whose correction relieved the symptoms without the aid of tinted glasses. In 1941 a conference of ophthalmologists was held in the Middle East and among the subjects that of calls of war on eyesight was discussed. High-grade vision was needed in mechanised warfare; clear sight in the right eye was often essential; good binocular vision was desirable too. In this climate eye strain became more significant, but sun glasses were not generally recommended. Eye strain was sometimes found to be due to other causes. For instance, a large number of girls in the A.W.A.S. experienced strain while working in parachute refolding platoons, and an unusual proportion reported for eye testing. Good lighting was essential for this work, and constant work with coloured fabrics accentuated symptoms associated with minor errors of refraction.

Special problems arose with the use of anti-gas respirators. A special frame, mark III, with flat wings was used for correcting the sight of men who could not see without help. The presbyopic were handicapped also. Major Bruce Hamilton described a simple "clip-in" device which was a modification of Kinmont's appliance. By placing the corrective lenses at the inner side of each eye piece and providing a means of adjustment for the pupillary centre, the device was made effective. Fortunately, these problems did not need practical solution on the field.

Ocular muscle balance was not found so important in the army as in the air force, but in the later years of the war when the full use of all available manpower was so essential, asthenopia became more significant. Bruce Hamilton tested the ocular muscle balance of 3,285 men and found 599 (18.2 per cent) showed some degree of imbalance. Most of the equipment used was home-made. He submitted 125 patients to orthoptic treatment, using whole day sessions, and obtained successful results in 79 per cent of these. One half of the convergent insufficiencies seen had a psychological basis. No regular equipment for orthoptic training was available in the army, but in some of the capital cities in Australia treatment was available through the cooperation of the R.A.A.F. at their orthoptic clinics.

Night vision was of military importance also, and is dealt with more in detail in the histories of the R.A.N. and the R.A.A.F. medical services. In the Royal Australian Navy, Dr James Flynn described a simple adaptometer constructed by ships' staffs by which the outline of a movable silhouette was observed in different degrees of illumination, produced through 16 different-sized apertures. In the army no standard test for dark adaptation was adopted, but medical units requiring an apparatus usually constructed one themselves. Bishop Harman's disc spotting test was generally employed. Towards the end of the war the night vision training and testing unit of the Royal Canadian Army Medical Corps

was obtained by Colonel J. H. Anderson, A.D.G.M.S., London and sent to Australia.

During the siege of Tobruk a number of men complained of night blindness, but the history was not accepted at face value, as the trying conditions there led to some exaggeration of symptoms on the part of those carrying out unpopular duties. There was no reason to suspect any vitamin A deficiency at the time, as the diet appeared to supply enough. The contrast between the glare by day and the blackout by night certainly imposed a strain, accentuated by any refractive error in men driving motor transport vehicles. No fundal changes were found in these men's eyes.

In Australia, later, tests of night vision were carried out at an army field vehicle school, and some observations were carried out before and after the giving of vitamin A in capsules.

In general the commonest cause of a complaint of defective vision at night was psychological, and for that reason it was wise not to draw attention to the subject.

#### INFECTIONS OF THE EYES

In the Middle East there were some analogies between infections of the skin and those of the eye, as the factors of environmental trauma, due to diet and dust, and bacterial contamination, were to some extent common. Conjunctivitis was sometimes apparently due to non-specific bacterial causes, at least specific organisms were not always isolated. It was not infrequent in men in the desert, owing largely to exposure to sun, wind and dust. Blepharitis was common and was often related to scurf in the scalp. No gonococcal ophthalmia was seen and no trachoma in Australian soldiers. Some of the affections of the lids were troublesome; a mixture of styes and an ulcerative type of blepharitis caused much thickening of the lids and resolution was slow. The infrequency of conjunctival infections in Tobruk in 1941 was remarkable, in view of the prevalence of septic sores on the skin, the dust, the swarms of flies and the shortage of water. Subacute relapsing forms occurred, resembling the Morax-Axenfeld type. Sulphonamide drugs were occasionally helpful. Experiences in the Middle East and in the Pacific Islands showed how important was corneal ulceration. It was doubtful if it was wise to send any man to the tropics who had previously had ulceration of the cornea. At least it was unwise to grade him in class A.

In New Guinea and similar humid climates, much of the palpebral and conjunctival trouble was due to sweat, dirt and dandruff; some was, in the opinion of Major K. B. Armstrong, associated with allergy. The most serious type of conjunctivitis was that due to the haemolytic *Staphylococcus aureus*, coagulase positive. When penicillin was available this was found to be effective, though the risk of contamination of diluted penicillin drops by the *pyocyaneus* organism was found to be real enough to warrant a special instruction describing the necessary precautions. Corneal ulceration was common with infections of this kind and tended to relapse.

In Thailand and Burma outbreaks of corneal ulceration were seen in various areas. At Thanbyuzayat and Tamarkan fulminating ulcers occurred, developing so rapidly that in 48 hours a mild conjunctivitis became a violent chemosis, with pouring discharge and widespread ulceration of the cornea, which sometimes showed bulging. Fortunately the necessary drugs for treatment were to hand on this occasion and with assiduous attention the results were good, though opacities cleared slowly and sometimes persisted.

#### KERATITIS

Various types of keratitis were seen in the Middle East. Major J. Bruce Hamilton concluded that about two-thirds of these were of the type presumably due to the virus of *herpes simplex*. A previous survey in Tasmania had convinced him of the connection with *herpes*, and of the existence of a number of corneal lesions in addition to superficial punctate keratitis. In the Middle East the same characters were observed; the appearance of the infection after pyrexia due to infection or non-specific protein injection, the tendency to relapse, the absence of conjunctival and uveal reaction, and the varied types of corneal lesion. Superficial punctate keratitis, marginal keratitis and dendritic ulcers were common. During the year ending September 1943 Major John Pockley saw 78 cases, all unilateral and of rather unusual kind. Conjunctival changes preceded the corneal signs, and the predisposing factors were thought to be malaria (in less than half the cases), typhus and malnutrition. The only form of treatment of sure value was daily application of 2 per cent silver nitrate. Results were usually good, but in some of the established infections corneal opacities remained. In New Guinea, Major W. J. L. Duncan found that among the troops infected with malaria there was an increased incidence of keratitis associated with *herpes simplex*.

#### TRACHOMA

No trachoma was seen in Australian soldiers, except a few who had previously suffered from the disease, but during the latter part of the war an ophthalmic survey of Australian natives was carried out west of Alice Springs. This was done by Chaplain Frank Flynn, who was also an ophthalmologist and acted there in a consultant capacity. As might be expected, the main disease encountered was trachoma; 448 aborigines were examined and only 51 were free of the disease. In older people the cornea became opaque, 7 per cent of the natives examined were blind in one or both eyes; scarring of the lids also caused deformities. Younger people up to 35 years of age showed varying degrees of activity of the trachoma, but at this stage there was no corneal infection. Under local conditions where efficient treatment was often lacking, corneal ulceration occurred and these frequently perforated, causing loss of vision; prevention was of course a matter of cleanliness and training. No simple efficient method of treatment was practicable as local applications, such as copper sulphate, could not be used long enough to do good. Sulphanilamide gave very

encouraging results. Penicillin was useful for corneal ulcers, and secondary infection, but had no effect on the original condition. The close contact of the natives, the continual presence of flies, dust, dryness of the air and glare were pre-disposing conditions.

It is of interest that trachoma among white Australians has declined steadily in the last generation. Even its frequency in Egypt did not cause a hazard to our troops.

#### EPIDEMIC KERATO-CONJUNCTIVITIS

Reports of a severe type of virus infection of the eyes from the United States of America and elsewhere caused a special instruction to be issued on the subject. Whether similar and earlier outbreaks were due to the same cause or not, was not of great importance, but in 1942 the highly contagious nature of this epidemic disease warranted special care in the services. The features included an incubation period of three days, malaise and fever, enlargement of the pre-auricular gland, acute purulent conjunctivitis of both eyes, with oedema of the lids, and almost invariable development of corneal infiltrates after 6 to 10 days. The corneal opacities were discrete plaques under the epithelium interfering with vision; they resisted all treatment and persisted for weeks or months. The measures advised were isolation and notification, bland irrigation of the conjunctival sac, and analgesic instillation when sensitivity to light was troublesome.

Major J. Hercus described an outbreak of 56 cases among Australian troops in North Queensland. Late in the summer of 1944-1945, an epidemic occurred, fortunately mild by comparison with those recorded elsewhere. Troops of the divisions were affected, the number in the area being from 50,000 to 70,000. Many of these men had malaria but there was no apparent connection. A mucopurulent conjunctival discharge appeared, with thickening and tenderness of the lids, and occasionally ulceration. There was no fever. The pre-auricular glands were swollen in half the patients. Vision was partly lost, and photophobia was common. Treatment with silver nitrate gave good results as a rule, though the deeper lesions took a month to resolve. Cultures revealed no bacteria, nor could a virus be grown. Mononuclear cells were found in the conjunctival exudate, but no inclusion bodies. No epidemiological data of importance could be discovered.

#### OCULAR COMPLICATIONS OF OTHER DISEASES

Relapsing fever occasionally caused iridocyclitis, so too did bacillary dysentery of the Shiga type, but this complication was extremely rare. In the latter, this rarity was possibly due to the early introduction and adequate use of sulphaguanidine.

Arsenical treatment in relapsing fever did not seem to improve the eyes, but complete recovery took place eventually. Conjunctivitis was an occasional event during the course of dysentery.

Malaria caused few ocular complications. Conjunctivitis was occasionally seen, and dendritic ulcers, as mentioned above; such relation was

probably non-specific. Sometimes in severe malaria hyperaemia of the optic disc was seen, and more rarely tiny retinal haemorrhages. Considering the pathology of malignant malaria, this is not difficult to explain.

Scrub typhus was productive of rare, but more serious eye complications. Thromboses in the central retinal vessels were seen in 7 out of 600 patients with scrub typhus; these varied from blocking of a small branch to complete bilateral thrombosis of the retinal arteries in one instance. Conjunctivitis was also seen, sometimes with subconjunctival haemorrhages, and during convalescence paralysis of accommodation was not uncommon, persisting sometimes for months.

#### INJURIES OF THE EYE

##### 1. *Environmental Trauma*

Dust acted as an irritant, but there were possibly other factors related to the size and physical nature of dust particles and the presence of infection. In the desert the dust was comparatively harmless; in more settled areas possibly this was not so. In view of the frequency and intensity of ocular infections in Palestine and Egypt, it is perhaps remarkable that more infections of soldiers did not occur.

Heat and light certainly played a part in producing conjunctivitis. The chronic infection of the lids often seen in the Middle East was probably due to non-infective factors.

Glare introduced a rather different problem. In Palestine Armstrong and others found that eye discomfort and headache were frequently associated with a refractive error whose correction relieved the symptoms without the aid of tinted glasses. In October 1940 the question was raised of the effect of glare on troops; at that time the reply was that antiglare glasses would be impossible for fighting troops. This proved to be only a partial answer, for, though it was on the whole better for the men to become accustomed to glare, a great deal was asked of their powers of adaptation from blinding sunlight by day to blackout by night. It was pointed out that dark glasses can do psychic harm and reduce powers of adaptation. Yet some men felt keenly the strain of glare on the desert; drivers of motor transport and anti-aircraft gunners for instance were in need of relief. Considerable help was given by the Australian Red Cross Society in providing goggles for drivers, and numbers of men bought Crookes or polaroid or other tinted lenses. Though there are men who exaggerate the effects of glare there are circumstances in which some protection is desirable. In lookouts in the navy and aircrews in the air force, special problems arose which will be dealt with in those histories.

In 1941-1942 in Syria, men at the ski school at the Cedars not infrequently had conjunctivitis, a well-known result of undue exposure to short wave radiations; photophobia from intense reflected light, under such conditions, was sometimes severe. The sclera was very congested, particularly where it was not covered by the lids. Blepharospasm sometimes was troublesome. Major J. M. Dwyer pointed out the similarity of these symp-

toms to those observed in motor transport drivers travelling over the 620 mile road from Alice Springs to Larrimah. In 1943, no less than 1,250 men were needed for this work, and a problem was created when many of them complained of eye strain. Dwyer noticed that less trouble was encountered after rain, and attributed this to the presence of cloud. Symptoms appeared after a latent period of a number of hours, with intense photophobia and congestion of the sclerae. Superficial punctate corneal lesions occasionally appeared. The road was bituminous, and there was no more dust than in many other places. Excessive drying was a possible factor in producing conjunctival hyperaemia. Chaplain Flynn produced evidence of a connection between this condition and the evaporation rate in different seasons, and pointed out the influence of certain individual differences in eye structure and function, such as the width of the palpebral fissure, the prominence of the globe, the frequency of blinking and the rate of tear formation. The eyeshields of respirators were helpful in preventing drying, but not all motor drivers were tolerant of them. Dwyer found that a green strip painted at the top of the windshield gave satisfactory relief, and this was adopted as a standard measure. It is interesting to contrast this with the complaints of glare by numbers of patients engaged in general duties, reporting at the 107th A.G.H. at Berrimah, near Darwin, at the end of 1945. Practically all of them had no defect of vision, but they complained also of general fatigue. No treatment was found necessary other than reassurance that they would lose their symptoms when they went south; there was no doubt a considerable psychological factor present.

*Pterygium.*—During the first summer experienced by troops in Palestine, numbers of men reported complaining of *pterygium*. A striking feature was the abundance of the growth on the conjunctiva, and its activity, which was greater than that seen in Australia. During 8 or 9 months some of these increased considerably in extent and bulk. Operation was followed by a definite reaction, and even simple marsupialisation produced local irritation for some time. It was found better to defer operation till the cooler months. In fact, the suggestion was made by an ophthalmic surgeon that if a *pterygium* of size warranting operation was present in a recruit, operation should be performed in Australia. The exciting causes in the environment were probably a combination of heat, glare, dust and drying effects. After the forces left the Middle East, *pterygium* receded in importance.

## 2. Photoretinitis

This potentially serious thermal lesion of the retina, due to infra-red rays, was of particular importance in anti-aircraft personnel. It is of interest to all Services, and effective preventive measures are not difficult. A description of the clinical and experimental work done on this subject will be found in the medical history of the Royal Australian Navy. One important feature may be mentioned here which was emphasised in these observations, that protection afforded by cutting down the visible radiations reaching the eye may give an illusory degree of protection. In civil life even recurrent warnings do not prevent people from exposing their



eyes to the hazard during eclipses of the sun. Three men were seen in Changi on Singapore Island in 1944 by Major R. Graeme Orr suffering from eclipse blindness.

### *3. Damage due to Toxic Gases*

Special instructions were issued to all Services concerning anti-gas measures, and first aid procedures should contamination occur. The treatment for mustard gas and similar irritant gases included methods advised for the eyes. Irrigation was not advised except in the earliest stages if droplet contamination had occurred a few minutes previously. Full pupillary dilatation was advised. Fortunately these instructions were never required in practice.

### *4. Eye Wounds*

In some features the eye injuries seen in the Middle East differed from civilian injuries. Sometimes patients with eye injuries did not arrive at a general hospital before a week or more had elapsed. In one hospital 55 soldiers were seen with a perforating injury of one or both eyes. Of these 33 came from Tobruk, where the conditions were of particular interest owing to uncertainties and difficulties of transfer of wounded men to base areas. Non-penetrating wounds were common there and were associated with the embedding of a lot of dirt. Major Morlet, the ophthalmologist with the 2/4th A.G.H., had always to consider what time would elapse before the man would again be in the hands of a surgeon. In Tobruk one eye had to be removed in 18 instances, and in one, both eyes. In the base areas a number of injuries were due to accidents, some of military type, others not. Foreign bodies in eyes raised problems. Many of them could not be dealt with by a giant magnet because they consisted of non-magnetic alloys. Others were not radio-opaque, being tiny particles of stone or sand, and multiple foreign bodies were common. Fortunately, sympathetic ophthalmia was not seen. A giant magnet was considered an important part of a hospital's equipment despite its limited sphere of usefulness, as some eyes could undoubtedly be saved by its use. A modern and practical giant magnet was specially designed in Australia, and manufactured in Melbourne. During the latter part of the war a magnet was available at strategic points in Australia and New Guinea. Sweet's localisers were also available at ten general hospitals and at base hospitals in most capital cities. Special instructions were issued dealing with the care of eye sockets after excision whether due to wounds or other reasons. The important points were the appropriate dealing with infection, provision of a temporary prosthesis, and, where retentive appliances or repair of a socket were also necessary, sending the patient to a plastic surgical unit.

Artificial eyes were made in the field by dental units, acrylic resin being used, and high degrees of excellence in fit and cosmetic effect were attained. Where this could not be done temporary prostheses were made of vulcanite in a dental laboratory.

The final technical instruction (No. 130) on ophthalmology issued in 1945, summed up the surgical practice of the eyes in army hospitals. *Pterygium* was operated on only when advanced. Operations for strabismus were not undertaken except for reasons considered specially cogent by the surgeon. During the war cataracts had to be considered, as some matured. If the soldier was incapable of resuming his re-enlistment occupation, or of following some other occupation, or of undergoing special training for a skilled calling, operation for the senile type of cataract was performed, but only in base hospitals. Glaucoma was also treated surgically in base hospitals or in the field, if acute in type. Retinal detachment usually required treatment in a base area. Some instances of this condition were reported by Major C. Colvin. Diathermy of the sclera over the affected points with aspiration of sub-retinal fluid below was used with satisfactory results. Corneal transplantation was carried out in one instance, by Peter B. English and J. McBride White, on a Sepik River native warrant officer, in 1945. This man had serious corneal scarring following accidental burning by a phosphorus bomb, and after transplantation of the cornea from the eye of a fatally injured soldier, sufficient vision was restored to enable the man to make his own way about.

#### BLINDNESS

Loss of vision in one eye or loss of one eye at first did not specifically exclude service with the A.I.F. A soldier who lost the sight of one eye through battle casualty or accident was classified C2 or D in the Middle East, but if he had 6/6 vision in his remaining eye and wished to remain with the force, a note was made on the board papers by the medical board. Later the definite ruling was that loss of sight in one eye would preclude a man from oversea service.

In November 1943 organisation began to collect information about service members in military hospitals who were thought likely to lose their sight, so that early training and re-education could be begun. By February 1944 a War Blinded Welfare Committee had been formed, with the object of correcting errors of environment and mental state in affected men and to give them an interest in re-education as soon as possible. The psychological aspects of loss of vision have been clearly recognised for a long time, and the excellent examples of training in special institutions have had a most inspiring result during the last generation. The early "flattening" of emotional reactions are often illusory and may be followed by depressive states or conditions of great tension. Writers like Harrowes have estimated the proportion of war-blinded men who have developed a characteristic tense depressive state at rather more than one-third. Restabilisation can usually be attained, however, and emotional balance is achieved. The psychological reactions of men who have lost one eye often need consideration also. These changes may be out of proportion to

the seriousness of the loss, and need careful handling lest a resistant attitude develop.

During 1939 to 1945, 2,423 men were discharged from the Australian Military Forces by reason of diseases of the eyes, and during 1946-1947 another 122. Of these, the total numbers discharged for loss of, or blindness in, one or both eyes, was as follows—

Loss of vision in one eye - 203

Loss of vision in both eyes - 16

It was of importance to define blindness for the purposes of restoring men to occupation, and on the 11th February 1946, a conference was held of representatives of the army, the Repatriation Commission and Associations and Institutions for the Blind. For the purposes of rehabilitation the definition of blindness was agreed to be inability to fill an occupation requiring sight. It was recognised that men who could move about freely with good peripheral vision would be seriously handicapped by loss of central vision. It was agreed also that it would be to the soldier's financial benefit to come under the care of the Repatriation Department soon, and the timing of his discharge therefore needed consideration. Arrangements were made for training centres to be established in several states. Special problems arose with men suffering from nutritional amblyopia, whose final medical boarding would be better deferred till their condition was approaching stabilisation. Further aspects of the training and care of men with varying degrees of loss of vision are outside the scope of this narrative. The importance of the problem is, however, great; early in 1946 an estimate was made that some 600 soldiers would come within the official definition of blindness (which as pointed out above, does not mean total loss of sight), and that at least one-quarter of them would need special training.

#### AMBLYOPIA

Impairment of vision from non-traumatic causes would not have been of serious magnitude as a war disability had it not been for the occurrence of large numbers of cases of amblyopia due to malnutrition. The types seen in civilian practice occurred, but were not significant. Quinine amblyopia was of negligible importance. Rare instances of transient affection of vision following high dosage of quinine were encountered, but the careful control of this drug and its administration prevented trouble.

For over a generation the occurrence of nutritional amblyopia has been known and the literature contains numbers of references. It is of interest that Sir James Barrett pointed out during the 1914-1918 war that visual disturbances occurred in Turkish prisoners of war, which were ascribed by him to pellagra. Most of these described a so-called retrobulbar neuritis followed in some instances by partial and largely selective optic atrophy. The majority, but not all, were observed in native races in the tropics. Nevertheless, the menace of this aspect of malnutrition was only clearly realised when prisoners of war subjected to poor dietary standards were released with severely damaged sight. The question of cause was reopened

and vigorously discussed. The possibility of a toxic cause was debated, but it seems likely that it is purely a result of deficiency, which may not be alone due to the lack of riboflavin, and whose mechanism may be due to toxic symptoms arising from withdrawal of substances necessary for specific cell metabolism.

Unfortunately there were ample opportunities of studying this nutritional amblyopia among the prisoners of the Japanese in South-East Asia. The results of these studies will be found more fully treated in the section on malnutrition.

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