Given a type of high legibility, and paper of a suitable kind, the quality of the printing has a marked influence on the effect of the printed pages and on the readability. Uneven and bad inking induces eye-strain. The printability of the paper and the care exercised by the printer have a marked effect on the clarity of illustrations.¹⁰

These brief notes on paper refer to letterpress printing and the subject requires study in different ways when the lithographic offset and photogravure processes are used.

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OPHTHALMIC TREATMENT IN THE FIELD, 1943*

BY

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"The CYCLOPS, a people of Sicily" *The Odyssey*

THE object of this article is to make a report on the present medical state of the ophthalmic battle-casualties from the Sicily and early Italian campaigns. My reason is the remark heard a long time ago of a cynic who left the operating theatre muttering "Very neat, but I would like to see that eye in two years time!"

The mobile ophthalmic unit

The conditions under which the unit worked were scarcely orthodox. Let me attempt to set the scene for you!

Take a case of instruments, a packful of test-types, loupes, the ophthalmoscope, and grab the first hospital-ship available. Your last-minute choice of essentials are flung at your orderly, together with the spare pair of shorts and shirt that will constitute all your "others" for the next three months.

Berth in Syracuse harbour for a hair-raising spell between a

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sunken hospital-ship and a burning oil-barge. Then disembark and hitch-hike to the medical area. This is of course in the local lunatic asylum; all the inmates are still *in situ*! Next morning you find that you are next to the famous quarries; where the Athenian shades in that earlier Belsen must often have shuddered at your school-boy translations.

Anyhow once more you are at the evacuation bottle-neck; to work and travel forward with the field surgical units. Soon the

SKETCH MAP

Legend

..... The travels of the Ophthalmic Unit during the four months under review.

facio-maxillary and neuro-surgical units will catch up and the "Trinity" of the old desert days is reconstituted.

Everywhere there are the elements of comic opera.

Leaning over the Municipio balcony at Lentini, you are greeted by loud "Vivas" from the town band dressed as Italian admirals. Forthwith they burst into spirited versions of the complete and unabridged anthems of all the United Nations both great and small. Oh! the sheer joy and relief when you lower your arm from that salute!

Gradually you acquire more equipment and drugs; operate and treat the cases from the malarial plain before Catania. As you move forward under the shadow of Aetna, streaming its plume of vapour across a turquoise sky, you wonder why the compo-box only yields sardines and plum-pudding as staple diet.

The Italian prisoners-of-war turn your grindstone to the strains of "O Sole Mio," whilst with the other hand they give graphic indication of Mussolini's ultimate fate. Amongst this babel the two of you sit shanking the uncut lens-blocks with wire-cutters. The high-spot of the day when you create the lorgnettes for the V.I. person!

Then the engineering college at Giarre, when the town current comes on. You hitch the lathe-belts to the grindstone and your optician gets showered with glass.

The centre of Messina where the R.A.F. had reproduced that earlier earthquake; the grapes the size of ping-pong balls and that fantastic ferry over into Europe. You sit on the canvas canopy of a lorry in the landing-craft, while your "slave-labour" flings the gear about to shouts of "Bellissima Napoli."

The long dusty ride up the coast of Calabria in the wake of the VIII Army, as it races to the help of Salerno. "The Road to Rome"—that Desert Divisional Axis of Wavell's day—seems at long last to be nearing its goal. In Sapri you dive off a DUKW to wash off the dust and come up among the jelly-fish!

A slight pause and the Army is switched again and you zig-zag across the "ankle" of Italy to finish up in a school-room at Barletta as the Termoli casualties pour in. A hectic four months you'll agree.

Classification of wounds

The following terminology has been adopted for the purposes of this report: "Penetrating" when a wound has opened into the interior of the globe. "Perforating" when there was a through and through wound of the globe. This is in contradistinction to the "double perforating," "perforating," etc., of Würdemann. The wounds have been arranged under the headings of the missiles, etc., that caused them (Table 1).

TABLE I

INJURY	NATURE OF MISSILE								Totals
	Shell	Mortar	Landmine	Booby-trap (Accident)	Bullet	Hand-Grenade	Bomb	Air-Cannon	
Intra Ocular F.B.	2	2	2	2	2			1	11
Corneal Wd. ...	—	—	1	1	—			—	2
Limbal Wd. ...	4	3	—	—	2	2		—	11
Scleral Wd. ...	—	—	—	—	—	—		—	—
Perf. Orbital F.B.	1	—	—	—	1	—		—	1
Corneal Wd. ...	—	1	—	—	—	—		—	2
Scleral Wd. ...	3	2	—	—	—	1		—	6
Non-Penetrating Orbital F.B.	—	—	—	—	—	—		—	—
Corneal, Scleral, Conjunctival F.B.'s	7	4	10	1	—	—	2	1	25
Occipital F.B.'s	1	—	—	—	—	—	—	—	1
Disorganised Globe	7	7	2	3	2	1	—	—	22
Injury Lids and Adnexa	2	1	—	—	1	—	3	1	8
Traum. Keratitis	2	2	—	—	—	—	—	—	4
C. Abrasion, Hyphaema	6	1	1	—	—	1	—	—	9
Lens Injury	1	—	—	—	—	—	1	—	1
Vitreous Haem.	5	3	—	1	—	—	—	—	10
Detachment Retina	1	—	—	—	—	—	—	—	1
Comotio Retinae Traumatic Mydriasis.	—	—	—	—	—	—	—	—	—
Optic Atrophy ...	2	1	—	—	—	—	—	—	3
Ocular Muscle Palsy	1	—	—	—	—	—	—	—	1
Rupture Choroid	—	1	—	—	—	—	—	—	1
Cornea.	—	2	2	1	—	—	—	—	5
" Limbus	—	3	3	1	—	2	—	—	10
" Sclera	2	2	2	1	—	—	1	—	8
Functional Amblyopia	2	2	1	—	—	—	—	—	5
Totals	51	37	24	11	8	7	7	3	148

The lesion reported was the most grave noted at the preliminary examination in the field unit, and the further complications are indicated in the notes below.

Wounds in general

As in the Libyan campaigns the shell-wound was found to be most common. The next commonest was the mortar wound. However the mortar was replaced in the later Italian campaign by the land-mine, which, in Libya, had been second commonest. This was bound to happen when the Army ran up against long prepared defences. Proportionately the bullet and the land-mine were the most destructive to the eye.

The number of men wounded was small—being 129 with 148 eyes involved. Including the men who died from other wounds, a total of 39 eyes were lost. Of those lost, some 22 were noted at first examination as hopelessly disorganised. Three of the cases have finished up under the care of St. Dunstan's.

The ophthalmic casualties once more would appear to have been about $2\frac{1}{2}$ per cent. of the total. This corresponds to the figures for the Russian casualties in the last war. From British experience it would seem that the American estimate of 12 per cent. (17 per cent. if gas be used) for the Pacific is rather high.

The figures for the 1914-1918 war gave 6 per cent. only of the ophthalmic injuries as due to indirect violence. Cases of this nature in the Libyan campaigns were roughly 50 per cent.; while in this series some 62 showed wounds of this nature, *i.e.*, 43 per cent.

It will be noted that in the analysis of the cases only "non-magnetic" fragments have been reported. Unfortunately the descriptions received of cases were not sufficiently full enough and by no means all F.Bs. removed from or with globes were tested against the giant-magnet. From my own impressions and previous experience I feel that the usual proportion for German missiles was that 30 per cent. were magnetic.

Again with the cruder Japanese missile the magnetic I.O.F.B. may well be more common. Loewenstein's statement that in civilian practice the I.O.F.B. is 90 per cent. magnetic and in military practice about 90 per cent. non-magnetic is thought to be too sweeping.

Analysis of cases

1. INTRA-OCULAR FOREIGN BODIES (24).

(a) *Corneal wound of entry* (11).—Eight of these had uveal prolapse, necessitating abscission of the prolapsed matter, complete conjunctival hood, purse-string suture, and instillation of either sulphacetamide or penicillin.

Two cases showed an early panophthalmitis at first examination, and though one thousand units of penicillin were instilled into the anterior chambers, both the eyes were lost. Recent work would show that this dosage was inadequate.

Two fragments were subsequently reported as magnetic-negative, and one of these eyes later flared up and was lost.

Two cases had had their prolapses cut off by a "general" surgeon whilst doing his routine toilet of other wounds, but unfortunately were not given a conjunctival hood. Abscission of the now recurrent prolapses, hood, etc., enabled one of the two eyes to be saved. Of two globes subsequently enucleated, one was removed five months later but no reason was obtainable from the records.

The final report received on three other cases was "quiet eye"; "healed but weak wound" and "F.B. in the lens, eye quiet."

(b) *Limbal wound of entry* (2).—Both of these cases required the routine abscission, hood, etc.

One report was "magnet-negative foreign body—eye quiet," whilst the other whose anterior chamber was full of lens-matter has been untraced.

(c) *Scleral wound of entry* (11).—Seven of these wounds were of temporal entry. It is thought that these would *all* have been "preventable" by the wearing of a "coal-scuttle" type of helmet. There was only one wound of inferior entry.

Three of the wounds were self-sealed, being caused by minute fragments. Eight of the wounds necessitated the insertion of scleral sutures, and then the abscission of the prolapsed vitreous. The wound was further reinforced by drawing over the conjunctiva as a hood.

Very large fragments were lying half in and half out of two of the globes. They had to be "eased-out" between the tightening sutures. One of these eyes was removed soon after arrival at the base-hospital. The other was retained for two months before being enucleated for "recurrent hyphaema." One of these two F.Bs. was magnet-negative. Two fragments lodged in the lens and one large one directly behind it. Though all three eyes have been retained the men's present M.O.'s report that the eyes are for all practical purposes blind.

Two other of the I.O.F.Bs. were reported as magnet-negative. One very small I.O.F.B. gave a resultant vision of 6/6 and the others were "6/24," "cataract" and "quiet eye."

2. PERFORATING ORBITAL FOREIGN BODIES. (3).

In one case the exit wound involved the macular area, and the final vision was "counts fingers at 3 feet." In another the lens was driven backwards and the eye was lost; the third man died of his other wounds.

3. NON-PENETRATING ORBITAL FOREIGN BODIES (6).

Two eyes which were markedly proptosed at first examination, gave final vision of "6/9 with pigment rings on the lens."

One fragment lodging in the roof of the orbit, with 6/18 vision and a hyphaema at first examination gave final vision of 6/6. Another penetrating through the upper lid gave only a small hyphaema and no final defect.

One incipient orbital cellulitis recovered quickly on oral sulphonamide therapy. One patient died of wounds when a fragment penetrated through the vertex, orbital roof and lodged in the orbital fat without touching the globe.

4. CORNEAL (ETC.) FOREIGN BODIES.

These small metallic fragments were left to extrude themselves after the application of sulphonamide ointment or penicillin and sulphanilamide powder. This treatment would appear to give excellent visual end-results. A similar routine was applied to all wounds that did not require immediate operation in the field unit.

5. FRAGMENT IN THE OCCIPUT.

The F.B. lodged in the dura, just over the posterior pole of the left occipital lobe, whilst bone fragments were depressed over the pole of the right lobe. On examination just prior to operation by Major L. S. Rogers, there was apparently a complete amaurosis. There was no sparing of the maculae and no pupillary response to light. Removal of the F.B. and elevation of the bone resulted in the pupils reacting to light soon after the patient came out of the anaesthetic. Confrontation showed that within 48 hours the sole residual effect was a small peripheral scotoma in the inferior-temporal field of the left eye. He was reported as discharged to duty in December, 1943, with "normal vision."

6. DISORGANISED GLOBES (22).

Associated with the majority of these were grave maxillo-facial wounds; six required repeated plastic procedures afterwards. Compound fracture of the superior maxillae was present in three of the cases; of the zygoma in two cases. One case had sustained total destruction of the bridge of the nose and another a fracture of the temporal bone. In one wound the missile passed through both temporal regions and though a pneumococcal meningitis developed the patient survived. One fragment passed directly backwards into the bulb and the patient died after 72 hours hyperpyrexia.

An early report on associated lid wounds received was that penicillin had made them "remarkably clean."

With one case the frontal lobes of the brain had prolapsed

through the wound of the eyebrow and in another they were found to be lying in the orbit when the time came to remove the remains of the eye.

7. TRAUMATIC KERATITIS.

Three of the cases slowly resolved to give a final vision of 6/6, whilst another of these gave only 6/18. In more recent fighting I understand another effect of indirect violence is to give a transient myopia of relatively high value (-9.D.) (Stallard).

8. LENS INJURY.

The case recorded was one of pure concussion effect giving a posterior cortical cataract and an iridodialysis.

9. VITREOUS HAEMORRHAGES (10).

Grave damage to the sentient portions of the globe was often veiled by these haemorrhages. Thus in three cases which appeared to have a vision of 6/24 with the haemorrhage, later there was demonstrated the presence of choroidal tears. Luckily two of the tears were peripheral giving a central vision of 6/6, but the third involved the macular area.

Stones had been blown by the force of explosions into the conjunctival fornices, in three cases, but the vitreous haemorrhages were small and quickly resolved. Although the force that carried a fragment into the frontal sinus through the trochlear fossa, gave a vitreous haemorrhage, yet the final vision was 6/6.

10. DETACHMENT OF RETINA (1).

This eye sustained a temporal scleral injury. Vision at first examination was 6/18 and the X-ray was negative for I.O.F.B. This was operated upon at 15.S. Gen. Hospital in Egypt. The man is now serving in Canada with 6/6 vision and "peripheral retinopathy."

11. LID WOUNDS (8).

As might be expected three of these were associated with destruction of the lacrymal apparatus and had peripheral concussion changes of the retina.

12. "RUPTURES OF" (19).

(a) Corneal ruptures (5). All these had a poor prognosis; two requiring enucleation at the base hospital in spite of attempted repair in the field unit.

The final reports on two cases with prolapse of the lens which underwent "abscission" was "quiet."

On examination of the last case a maggot crawled slowly out of the anterior chamber through the corneal wound! The eye is

still "in" but St. Dunstan's report "Total leucoma and disorganisation of the globe."

(b) Limbal ruptures (8). When first examined one of these showed an early panophthalmitis. Another with "F.B. in the posterior sclera" and lens prolapse was enucleated three months later as a painful eye.

Two cases are reported as "quiet": the first with no anterior chamber and the second with a traumatic cataract noted when first seen.

One case with anterior synechia, after iridotomy has 6/6 vision, and another report was "leucoma, localised cataract and iridodialysis."

(c) Scleral ruptures (8). Six of these had temporal wounds—again "preventable" by a "coal-scuttle" helmet.

Seven required the insertion of scleral sutures, and abscission of prolapsed vitreous. Of these three eyes were lost and one man died of other wounds.

The final state of the others was "white eye, quiet" (this eye required four sutures), "P.L.(2)" and "No P.L."

13. RESULTS OF TREATMENTS.

The best results would seem to have been achieved in the use of penicillin and sulphonamides locally—combined with oral administration of sulphanilamide. Thus in the "abscission": after the prolapse was removed, 500 units of penicillin in sulphanilamide powder were instilled before the purse-string suture closed the conjunctival hood. Then 2½ per cent. albucid or 5 per cent. sulphanilamide ointment was inserted between the lids. The eye was finally covered by a dressing of sulpha-vaseline tulle-gras before the pad and bandage were applied.

Conclusions

(1) A man who sustains a major wound of the eye is rarely fit enough for front-line duty again; although the numbers of eyes saved by prompt treatment and early operations are a considerable advance on the last war. In this the findings of the Sicilian fighting parallel those of the Libyan campaigns.

(2) A policy of minimal interference during evacuation and the use of penicillin and the sulphonamides locally has considerably cut down the amount of "hospital infection."

(3) The need for a "coal-scuttle" type of steel helmet it is felt cannot be too strongly emphasised.

Summary

1. An analysis has been made of the 129 ophthalmic casualties treated in a Mobile Ophthalmic Unit in Sicily and Southern Italy campaigns.

2. The types of wounds encountered and their treatment in the field have been outlined.

3. The results of such treatment and the final visual capabilities of the eyes treated, some two years later have been indicated.

My apologies are due to the many service departments, English, Canadian and American, that I have "badgered" for case records during the past six months.

My thanks are especially due to Sgt. F. Hales and Pte. R. Merrett, R.A.M.C., without whose drive and above all cheerfulness we might never have done the job, even with the help of our innumerable "tonios."

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CAVERNOUS HAEMANGIOMA OF THE ORBIT SUCCESSFULLY REMOVED BY SHUGRUE'S OPERATION*

BY

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THE removal of a retrobulbar intra-orbital tumour is a rare event, which is worthy of record in view of the dangers of injury to the delicate intra-orbital structures. In the recorded cases of successful removal of intra-orbital cavernous haemangiomas, the tumour has been well encapsulated, a factor greatly facilitating the operative procedure. It is also remarkable that there have been no supplying blood vessels of sufficient size to cause appreciable haemorrhage after the enucleation of the tumour.

A retrobulbar intra-orbital tumour could only be exposed through one of the bony walls of the orbit, and although every route has been exploited, the two most commonly used routes are through the roof of the orbit or through its outer wall. The approach through the roof of the orbit is necessarily an intra-cranial approach, and although the dura mater could be reflected off the bone if there were no intra-cranial extension, it is generally agreed that this route should be reserved for cases in which there

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