The exposed mucous membrane of the ectopic bladder is a distinct danger, and many examples of the development of epithelioma have been recorded. Quite apart from this risk it is offensive to the eye, may give rise to an unpleasant discharge, and is liable to mild injury and excoriation. In either sex some sort of plastic repair of the affected area is desirable.

With the lesser anomalies the question of marriage is often raised, and even in complete ectopia patients of either sex have sought the consolation of matrimony. The female with a normal partner may prove fruitful, and there is no reason why such marriages should not be happy. There appears to be no special risk in pregnancy, and, since the pubes is constantly separated, labour is often easy (Case 2). In the male sexual gratification is said to occur, but neither of my married male patients has as yet become a father. Now that the transplantation is less likely to be attended by sequelae, I welcome the opportunity of carrying out more careful and complete restoration of the genitalia.

Separation of the Pubic Bones.—In the case of complete ectopia the pubic symphysis is separated to the extent of from four to six inches, but the bones are connected by a very strong ligament. It is often assumed that such a degree of separation will result in marked disability, but though the thighs are more or less widely separated and the patient walks with a characteristic gait, they are usually quite strong and able to carry out ordinary activities without impediment.

Other Pre-operative Problems that may Arise.—Sometimes there is weakness of the anus with incontinence, and on occasions prolapse. If this is associated with some degree of spina bifida and perhaps weakness of the lower limbs no improvement can be expected, and transplantation into the usual site is contraindicated. Confronted with these circumstances Hey Groves made the transplantation into the caecum, and combined this with a left inguinal colotomy. As a result not too frequent pultaceous stools could be easily controlled by a colotomy belt, and for some years the patient was able to lead a sheltered but useful life.

Contraindications to Transplantation.—Marked pyelitis and pyonephrosis are usually regarded as contraindications to transplantation. It is always worth while establishing external loin drainage by nephrostomy and, if sufficient improvement follows, to proceed to transplantation while the drainage is still operating.

The Widening Scope for Transplantation

For many cases of *malignant disease of the bladder* total cystectomy holds out the best prospect of long palliation or even cure. In this operation it is necessary to divert the urine, and by far the best plan is to carry the ureters into the bowel. The technique is the same as that used in other cases. When the transplantation is a proved success—and this is usually assured in three or four weeks—the removal of the bladder may be carried out.

In some cases of *malignant disease of the cervix* extension to the adjoining bladder renders treatment both by radium and by hysterectomy impracticable. In such cases total hysterectomy, together with simultaneous removal of the bladder, holds out some prospect, and in the absence of glandular involvement or distant dissemination should be practised. The transplantation of the ureters should be a first stage, and the next part of the operation should not be undertaken until the patient has become stabilized under the new physiological conditions. An interval of 6 to 8 weeks will probably suffice, but there should be no unwarranted haste.

For some years now the operation has been used for certain intractable cases of *vesico-vaginal fistula.* In such cases transplantation should not be combined with a last desperate attempt at local repair, but should be a deliberate intervention only to be carried out after proper preparation. In the *systolic bladder,* which is sometimes a problem after the successful removal of a tuberculous kidney, diversion of the ureter into the bowel may bring great relief.

Transplantation has also been used in certain cases of severe *injury to the urethra* usually associated with fractured pelvis. Though this indication is among the rarest, it should be kept in mind.

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OCULAR MANIFESTATIONS OF NEUROSES COMMONLY FOUND AMONG SOLDIERS

BY

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Fear and environmental stress are very prevalent in wartime and often give rise to chronic anxiety. Many soldiers react to such a chronic anxiety by developing a neurosis, of which there are two main varieties—hysteria and the chronic anxiety state. Whether one or the other will develop depends on the individual personality type.

The hysteric has an essentially childish personality with an undeveloped or perhaps only unsustained sense of social responsibility. He reacts to the anxiety by dissociation, which may affect nerve, muscle, bone, joint, an entire limb, memory, the conscious state, etc. He is very open to suggestion, and the type of somatic localization may be suggested by his observation of the infirmities of others or his memory of past disabilities within himself. In this way undue prominence is given to a condition already present, or else one is created entirely *ab initio.* The somatic incapacity is such as to still the anxiety or the conflict that may have arisen between it and duty. The more successfully this is done the happier is the patient, who may indeed wear a fixed look of quiet satisfaction throughout the day.

The patient who develops a chronic anxiety state is usually a more mature personality with some awareness of his obligation to society. His reaction to the anxiety provoked by fear or environmental stress is different from that of the hysteric. The early somatic upset appears to take place in the endocrinal and autonomic systems, leading to disturbances of the vasomotor, respiratory, sudomotor, or gastro-intestinal system. In this way are produced palpitations, vascular throbbing, headache, syncope, flushes, paraesthesia, breathlessness, sighing, undue sweatings, vomiting, diarrhoea, and dry mouth. The somatic incapacity is frequently not sufficient to assuage the anxiety of the patient, who may present a worried, unconfident attitude to the outside world.

As a result of hysteria and chronic anxiety state, various conditions arise in and around the eye. Indeed, it may be said without exaggeration that half of the soldiers presenting themselves at the out-patients' room of the eye department of this hospital in the Middle East have complaints which may fairly be described as functional. The most frequent, and those that will be dealt with in this report, are defective day vision, defective night vision, asthenopia, diplopia, headaches, photophobia, spots before eyes, and epiphora. All of these symptoms are found in organic conditions. Investigations into each of them should therefore take three main directions: (1) exclusion of organic disease, or, if present, an assessment of its role in the production of the symptoms (organ–symptom parallelism); (2) a detailed investigation into the nature of the symptoms; (3) some investigation into the patient's personality (while in difficult cases this is the sphere of the whole-time psychiatrist, the ophthalmologist should be capable of the simpler approaches). As investigation No. 3 applies to all the symptoms similarly, a brief generalization will be made now of the main points of inquiry.

Inquiry should be made into the presence of any worries, dislikes, or fears, and the degree of duty sense as evidenced by his former reactions to life. Search should be made for anything in the personal or family experiences of the patient, or in his general environment, that might have suggested the symptom to him. This may be a weakness of one eye which the patient had many years ago, or a history of blindness in his family, or the defective night vision of which his friend in the unit has complained. The relation of the symptom to change of environment should be noted, especially when a new climate provides factors, such as heat and glare, which can be blamed for it. It is noticeable how often among the troops in the Middle East a visual complaint began on the voyage out between Freetown and Capetown. It is as if there were an incubation period for the symptom.

The reaction of the patient during the examination should be carefully noted. Is he "too accepting" of the symptom, or is he disgruntled or even aggressive? Are his responses variable, and is he open to suggestion? Is there hesitancy of speech, or is there a stutter? Note if his attention wanders during the course of the examination.

After such inquiry a general idea of the personality pattern of the patient should be known.

Defective Day Vision

Defective vision is a common functional symptom. It may vary from complete blindness of one or both eyes to a lowering of visual acuity to the neighbourhood of 6/24 or 6/36.

It should not be difficult to diagnose the presence of organic disease or disability. In disseminated sclerosis, however, this may not be very easy. The main difficulty is to be able to state that a given organic condition is sufficient to account for the degree of the symptom. Only experience can tell the ophthalmologist how much visual defect can be expected from an organic condition—in other words, whether or not an "organ–symptom parallelism" is present in any particular patient. This difficulty is encountered particularly in fairly high astigmatism. It is often not possible to state definitely that a patient whose 3 dioptres astigmatism has been corrected with a lens should see more than the admitted 6/24. If the condition is bilateral the question of amblyopia does not arise in such cases.

A detailed investigation into the nature of the symptom should now be made. Most symptoms can be analysed and the component parts found to have a certain parallelism with each other. With vision, investigation into this "symptom parallelism" can be carried out in different ways.

The two main methods used in this department are tests of visual fields and the plotting of vision correlation curves. The visual field tests are well known, and are dependent on the fact that the fields for white targets of different sizes have a certain relation to each other and to fields for targets of different colours. In functional conditions the normal relation is upset. For example, the field for a 5-mm. white target may be larger than that for a 10-mm. target in certain meridians. A correlation curve depends on the simple fact that the number of lines read on a Snellen chart varies fairly directly with the distance of the patient from the chart. The acuity is taken at six to eight different distances from the chart, starting at the furthest one. It is important to vary the order in which the acuity at different distances is taken. A graph is then made, using the distances from chart as abscissae and the Snellen lines read as ordinates. In normal cases the resulting graph is almost a straight line. Fig. 1 is an example of such.

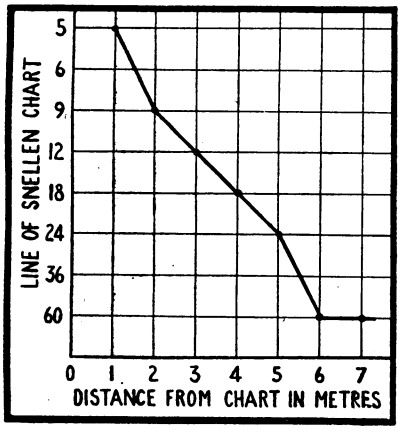

FIG. 1.—Correlation visual curve of a case of refraction error. (Note that the line is almost straight except at the end.)

In functional visual defect the graph is not straight. Fig. 2 shows graphs taken from a soldier with hysterical amblyopia of both eyes.

Important points to elucidate in the psychiatric approaches to such cases are the presence in the patient's history of any eye condition that may have made him "vision-subconscious" and his suggestibility to further acuity of vision during the test. Pentothal sodium is an excellent diagnostic adjunct in cases in which the amblyopia is complete in one or both eyes.

It is the experience in this department that hysterical defects cannot with certainty be differentiated from simulation or malingering by physical tests only. In these tests it is not possible to exclude with confidence the effect of suggestion. The ultimate differential diagnosis between hysteria and simulation or malingering must be based on the psychiatric assessment.

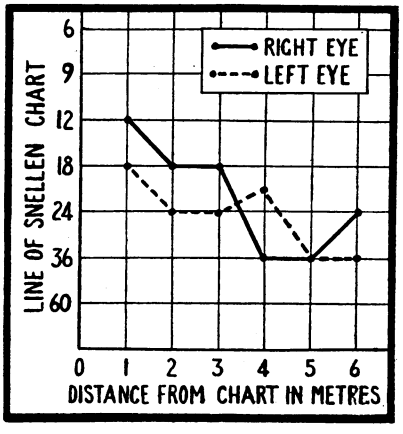

FIG. 2.—Correlation visual curves of a case of hysterical amblyopia of both eyes. (Note variation in direction of curves.)

Treatment of Defective Day Vision

As most of these cases are hysterical the treatment is difficult. The visual defect may be removed by suggestion with or without the use of narco-analysis, but the underlying personality defect persists and may show itself later as a relapse of the visual defect or as a somatic disturbance elsewhere. Patients who have had complete blindness in one or both eyes before treatment are unlikely, in our experience, to become fit to return to a forward area. They may, however, carry out useful duties at the base for a long time. Indeed, a relapse may never occur if the precipitating factor of the emotional disturbance has been removed. Patients who have a partial loss of vision —to, say, 6/24—do not seem to do well, and often require to be invalided. It is important to have the help of a trained psychiatrist in the diagnosis, and especially in the disposal of cases of severe hysteria. In the exigencies of war, however, it is rarely possible for him to effect the profound personality change necessary for the permanent removal of the underlying cause of the patient's symptoms.

Defective Night Vision

Defective vision in the dark is a common complaint among troops. Most of these patients state that in the dark it was necessary for them to take a companion's arm. This is a convenient mode of assessing the symptom, as it supplies a certain relative quality to the patient's complaint. Many state that they had bumped into objects in the dark or fallen into slit-trenches. Of this it must be said at once that there are few people who have not had similar experiences since the institution of the black-out.

Defective night vision may be a symptom of organic disease. It may be found in moderate as well as high degrees of myopia, in choroiditis, retinitis pigmentosa, vitamin A deficiency, and toxaemia. Every patient complaining of this symptom should be examined for these conditions. During the past six months three cases of retinitis pigmentosa were seen in this hospital. It must be borne in mind that defective night vision may precede the appearance of the pigment in the retina. During the past year we have seen only one case in which food deficiency was a possible cause. There was one case of alcoholism, and it is suggested that inquiries into this condition should be made in every instance.

Measurements of vision in the dark are made on a dark adaptometer. For this purpose Koch's modification of the Hecht apparatus is used. With it a sufficiently accurate measurement of the minimum light and form senses can be obtained. The light minimum can be measured from 2 to 6 micro-millilamberts (log units—μml.). The minimum form sense is measured by the amount of light necessary to determine the

letter "E" 10 mm. in size and placed 380 mm. from the eyes. As the "E" can be revolved a check on the patient's accuracy can be made. The minimum light sense is usually examined after 3 and after 30 minutes' dark adaptation. The minimum form sense is examined after 30 minutes' dark adaptation. The following are normal figures on this instrument:

Minimum light sense: 5.2 μml. after 3 minutes
3 μml. after 30 minutes
Minimum form sense: "E" recognized by 30% with 4.2–5.5 μml.

In pathological conditions there is usually a fairly parallel diminution in minimum light and form senses. In functional conditions there may be a gross disturbance in this "symptom parallelism." For example, in repeated cases of neurosis with complaints of defective night vision the minimum light sense after 30 minutes' dark adaptation was in the proximity of 3 μml., yet the "E" was not perceived at this point even with 6 μml. This lack of "symptom parallelism" is similar to that already described above, and in some cases may be of help in the diagnosis of functional night-vision defect. It should be noted that in apparently normal subjects not complaining of defective night vision it is not unusual to find a poor minimum form sense in tests with the dark adaptometer. Another helpful example of symptom inconsistency is that the figures obtained for the light and form senses may vary from day to day. This, in our experience, does not occur in any organic eye condition.

Men complaining of defective night vision and not showing any physical defect should be examined by a psychiatrist. Particular investigation should be made into the reaction to dark during childhood and the incidence of defective night vision in the soldier's unit and among his friends. In connexion with the suggestibility of the patient, the use of the phrase "night blindness" on any document to which the soldier has access should be strictly avoided. It is a fluent phrase easy to remember and quickly passed from mouth to ear.

Treatment of Defective Night Vision

Cases of functional defect of night vision are rarely amenable to direct psychiatric treatment, although they may be somewhat helped by rest and change of environment. Disposal should not be based on one investigation of the dark adaptation alone. It should be repeated several days later. If the minimum form and light senses are both within normal the patient should be reassured and returned to his unit in his original category. If the symptoms are severe and are supported by findings with the dark adaptometer he should be examined by a psychiatrist, and the ultimate disposal will depend on the psychiatric findings. In this connexion it is recommended that all those in one area complaining of defective night vision should be seen by one ophthalmologist, who is then in a position to detect a tendency towards "infectious spread" in any unit. Everybody has some difficulty in moving about in the dark, and the requirements of the Service or a danger of the complaint spreading may easily modify the suggested disposal to a more stringent one.

Diplopia

Diplopia is a common functional symptom. It may vary from a momentary slight separation into two images to a constant and well-defined double vision. To investigate the possibility of organic origin the usual tests for muscle paresis, muscle spasm, convergence weakness, concomitant squint, and muscle imbalance should be carried out. Most of the functional diplopia in the Army is found in the following types of cases.

(*a*) There may be a concomitant squint which has been present since childhood without giving rise to diplopia until recently. In civilian life it is very uncommon to find diplopia in an adult with concomitant squint. Yet such cases due to emotional stress are seen in this department almost every week. In these an organic condition is present, but the symptom-effect is not parallel with it. It is an interesting fact that suppression of one image that took place at, say, the age of 5 years and has persisted since should after two decades be functionally removed.

(*b*) There may have been a muscle imbalance which has persisted for years without causing diplopia. During these years the duction power has sufficed to overcome the tendency to squint. Under conditions of emotional strain this duction power may break down, when a small-degree horizontal or vertical squint with diplopia results.

(*c*) The functional disturbance may produce a spastic squint, which is usually convergent. Three such cases seen in this hospital during the past year were due to spasm of the internal rectus muscle. Ocular movements in these cases were good, if inclined to be jerky. The diplopia was found only in the central part of the field, both images coming together as the object was moved to the right or the left.

(*d*) The functional disturbance may produce a partial or complete loss of convergence. The diplopia is most marked at near vision. Some cases of partial loss of convergence are associated with exophthalmos, as will be mentioned later.

Treatment of Diplopia

Spastic squint and convergence loss may be cured by psychiatric measures alone. The results may be immediate and very striking. In these conditions there has presumably been no pre-existing organic disability.

Treatment of hysterical diplopia associated with concomitant squint or muscle imbalance that has become a squint is very difficult. I have not seen a case which has been cured by psychiatric measures alone. With these cases it is best to use both the psychiatric and the physical approaches. As the first measure the patient should be given some insight into his condition by the psychiatrist. Stress is laid on this being done before prisms or operation are tried. There are two reasons for this order in the treatment. In the first place, it prepares the patient to accept the later optical or surgical help. The operation cannot be guaranteed to have the necessary precision, and the patient should know beforehand that he must contribute to the cure. In the second place, the patient's confidence in his physicians is maintained. If he is sent to a psychiatrist after incomplete cure of his diplopia by surgical measures he is inclined to think that he is being passed to another doctor in view of the surgical failure; or, in his own words, that he is "being messed about."

Should psychiatric, surgical, and prismatic treatment fail, the patient should be made uniocular by placing a frosted glass before one eye. He should then be categorized "B1 (Base only)." Even then he may have the last word by developing photophobia in the used eye.

Asthenopia

Ocular fatigue is fairly commonly functional in origin. In many cases there is a small refraction error, which, however, under other circumstances might not have been expected to cause any symptoms. Whether or not glasses should be prescribed for any individual case depends on the experience of the ophthalmologist. It is felt that there is over-prescribing. Yet a fair balance is difficult in the midst of a large out-patient day, and the patient is often given the benefit of the doubt.

Phorias and convergence insufficiency should be examined for in these borderline cases. It should be remembered that a certain degree of exophoria at near vision is normal. It can be invoked to explain asthenopia only if the positive duction power is not sufficient to control the degree of exophoria. If the muscle balance and the duction powers are within normal, and if after the use of suitable lenses the patient continues to complain of fatigue and strain, the case in the great majority of instances can be considered to be functional.

In considering asthenopia mention should be made of the poor lighting conditions found in many Army offices. These should be inspected periodically by the D.A.D.H. in conjunction with the ophthalmologist of the area.

Headache; Photophobia; Muscae Volitantes; Epiphora

These form a well-defined group of symptoms, all or some of which are often found in the same patient. In the production of some of these symptoms there is probably a disturbance of autonomic control. Unlike the functional diplopia and defective day or night vision which have been referred to as hysterias, this group of symptoms, together with asthenopia, may be more properly defined as the chronic anxiety state with ocular manifestations.

The headache is usually retro-ocular or bitemporal. It is often felt on the side where one eye has had some chronic defect, such as amblyopia. Practically any adjective may be used by the patient to describe the pain. It may or may not be associated with the use of the eye. It is often evoked by

exercise or excitement. The pain never wakens the patient during the night, although he may waken in the morning with it. This symptom, like all those mentioned in this report, is frequently associated with a change of environment. In many respects the photophobia runs parallel with the headache. It, too, may be unilateral, and be felt on the side on which, as the patient is aware, there is ocular inferiority. Dark glasses are often worn on days not much, if any, brighter than can be experienced on summer days in Britain. Their use appears to have a symbolic significance to the patient. As stated, muscae volitantes and epiphora are often associated with photophobia and headache. Like them, they are very variable in their incidence: days may pass without the patient experiencing them.

Before making the diagnosis of chronic anxiety state with ocular manifestations it is, of course, important to exclude organic disease. The media of the eyes, fundi, and tear ducts should be investigated.

It is interesting to note in connexion with the disturbance of autonomic control which is suspected to be the basis of this group of symptoms, that a number of cases presenting the syndrome of headache, epiphora, and photophobia later develop exophthalmos with a well-marked von Graefe sign. In them there is not necessarily thyroid enlargement or increase in pulse rate. As mentioned above, such cases may have a partial loss of convergence, with diplopia.

Treatment of Chronic Anxiety State with Ocular Manifestations

The treatment of chronic anxiety state with ocular manifestations is more satisfactory than that of ocular hysteria, and in many cases can be satisfactorily carried out by the ophthalmologist. The qualities required are patience, kindliness, and directness. It is easy to advocate these qualities, though difficult to show them in the rush of the clinic. Nevertheless no good treatment of the chronic anxiety state can be carried out without them. There must be patience to listen to the man's story, to watch his mind during the examination, to evoke his past life and environment, and to interrogate his emotions so that the hidden anxiety state may be exposed. This must not be done in a gruff manner, otherwise the patient becomes defensive and more tongue-tied than ever. There must be directness to impress him that no disease of the eyes is present and to indicate the manner in which the symptoms arose. There are few patients who do not intelligently and emotionally respond to this treatment.

Summary and Conclusions

In this report mention has been made of (*a*) the two chief psychical conditions—hysteria and chronic anxiety state—which cause a variety of ocular symptoms; and (*b*) the differentiation of these functional symptoms from those produced by organic disease.

For clarity the psychosomatic processes have been described as well-defined entities. These processes are personality reactions, and although the individual may show a tendency to react in a certain way, personality is too complex for the reaction to be simple and uniform. In practice many a case does not fit into a clear-cut pattern. An obvious hysteric may develop symptoms described above as chronic anxiety state with ocular manifestations, while a case with hysterical symptoms in the eyes may have a well-developed chronic anxiety state. Moreover, the difficulty is not only as between one functional condition and another. Both an organic and a functional condition may be present in the same patient. Their relative significance in the production of the symptoms is of therapeutic importance. Only a very careful physical examination together with some considerations along the lines indicated above, and the experience of the examiner, can help disentangle the threads.

It may be of some help to think of organic and functional disturbances coexisting in one of three different ways: (1) The association in one patient may be fortuitous. (2) A functional disturbance may be superimposed upon an organic one, modifying or aggravating the symptoms. (3) The psychic disturbance leading to upset of ocular function may appear to be an integral part of the organic process. This is noticed in disseminated sclerosis. It is not unusual in this disease for the "functional" symptom to be the predominant one and to be present for a long period before the "organic" symptoms arise.

I would like to express my thanks to Brigadier C. W. Graham, Consultant Ophthalmologist, Brigadier G. W. B. James, Consultant Psychiatrist, M.E., Major J M. M. Jacobs, and the staff of No. 2 Psychiatric Centre for their generous guidance and help. Many of the cases were diagnosed and treated in No. 2 Psychiatric Centre.

HUMAN FIBRIN AS A DRESSING FOR BURNS*

BY

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The copious and continued oozing of fluid from a superficial burn is a curious contrast to the behaviour of an abrasion, which soon becomes covered by a scab of dried and clotted exudate. It is clear that the normal mechanism of haemostasis is unable to control the exudation of plasma from the capillaries at the surface of a burnt area. It is a temptation to think that the delay in healing of such burns as compared with abrasions of equal magnitude may be the result of this continued oozing, since in the haemorrhagic states even minute wounds may refuse to heal for weeks unless leakage of blood is stopped by suitable treatment. It is certain that in severe cases the loss of fluid from the burnt area may be so great as seriously to aggravate haemoconcentration, and a practical method of controlling this loss would be of clinical importance.

Attempts were made, therefore, to control this exudation by means that are usually successful in controlling the exudation of blood in the haemorrhagic states. To begin with, various coagulants, such as Russell viper venom and thrombin, were applied to the surface of burns, but any hastening of coagulation that was produced appeared ineffective.

It was observed that blisters forming soon after a burn usually contained masses of loose trabeculated fibrin that had no controlling effect on the exudation of fluid. The "blister fluid" that was drawn off and examined contained a further small amount of fibrinogen and often underwent secondary clotting in the test-tube, suggesting that the clotting mechanism was not seriously deranged. Unfortunately it was not possible to make quantitative estimations of fibrinogen and prothrombin on the exudate before it had partially clotted. Experiments with blister fluid showed that it differed little from the patient's serum. Titration of the immediate antithrombin, the progressive antithrombin, and fibrinolysin gave results essentially the same as those obtained with the blood serum. From these observations it appeared that the continued exudation of fluid might be the result not of defective coagulation but of a capillary defect, so that the local condition might be analogous to the continued bleeding in the purpuras, in which coagulation is normal. No effect would therefore be expected from the mere addition of coagulants to the issuing fluid: as in the purpuras, the flow must be stopped by mechanical means.

It was therefore decided to attempt to seal the burnt surface with some relatively impervious dressing. Human fibrin was chosen as the physiological ideal, and it was hoped that its presence might reproduce the conditions in traumatic wounds and encourage healing. After unsuccessful attempts to produce a sufficiently tough and adherent membrane by covering the burn with concentrated fibrinogen solution, or dried fibrinogen subsequently clotted by a spray of thrombin, it was decided to preform the fibrin membranes and apply them when required.

Preparation of the Fibrin Membrane

The technique that finally evolved was as follows: Human plasma was allowed to clot in flat shallow dishes. The ordinary photographer's earthenware developing-dish about 12 in. by 10 in. was found satisfactory. Before adding the plasma the dish was levelled with a spirit level in order to ensure even thickness of the membrane. About 450 c.cm. of plasma was used for each membrane, and this was mixed with 100 c.cm. of 1.18% $CaCl_2$ and 0.5 c.cm. of 1 in 100,000 Russell viper venom, in a large measuring cylinder. The mixture was rapidly poured into the dish and any large bubbles burst with a hot wire. Firm coagulation usually took place in from a half to one minute. The clotted plasma was allowed to stand for 30 minutes and was then covered with about 500 c.cm. of tap-water. By gently rocking the dish the clot was detached from the sides so that it floated freely in the water. It was

* A report to the Burns Subcommittee of the M.R.C. War Wounds Committee.