A PRELIMINARY NOTE ON THE NATURE AND TREATMENT OF CONCUSSION.

BY

T. E. HARWOOD, B.A. OXON., M.B., CH.B. EDIN.,
RESIDENT OPHTHALMIC OFFICER, THE KING GEORGE HOSPITAL, S.E.

IN the treatment of neurasthenic conditions arising in the course of the war one point would appear to have attracted but little attention. Almost every patient will be found to have more or less difficulty with reading. This is usually taken for granted and passed over as a mere incident. In reality it gives a clue to the most efficient treatment of such cases, from whatever cause arising.

The living body may be compared to an electrical system, which may break down owing to faults either in the circuit or in the battery. An organic nervous lesion may be compared to a break in the circuit, a functional nervous condition to a lowered efficiency of the battery, affecting the whole circuit, but usually showing its effects more markedly in some parts than in others.

The patient who has had a head injury involving the loss of brain substance usually shows signs and symptoms that are recognized as those of an organic lesion, but he also shows signs and symptoms which cannot be directly associated with the definite organic lesion and are the result of the shock to the nervous system as a whole; a functional condition is superimposed upon the organic. A destructive lesion of the left lingual gyrus, for instance, does account for blindness of a quadrant of both fields of vision; it does not account *per se* for giddiness, nausea, tremors, palpitation, dyspepsia, functional paralysis, neuralgia, and joint pains lasting, perhaps, for months. In cases of concussion without injury the same group of functional conditions occurs, and such cases differ from the neurasthenias of everyday life only in severity and apparent suddenness of onset, the cause being the same in every case—namely, a lowered efficiency of the battery.

Neurasthenia, in the widest possible sense of the term, corresponding to a lowered efficiency of the battery, is a general condition affecting every function, organ, and tissue of the body, though its effects are usually more marked upon some one function or organ or tissue than upon the rest, so that different names or labels become attached to different forms of the same underlying condition. The ciliary muscle is affected equally with the rest of the body, with the result that the smallest errors of refraction frequently become almost insuperable difficulties. Asthenopia following head injury or concussion is rarely due to any definite injury of the eye or its nerve supply, but simply to an inability of the ciliary muscle to make the smallest effort. Even a 0.25 cylinder may in these conditions alter the visual acuity from less than $\frac{1}{6}$ to $\frac{1}{12}$; and in most cases the visual acuity can readily be shown to depend simply upon the refractive error. The patient who has had a sudden paresis of an external ocular muscle may have diplopia, headache, giddiness, nausea, and vomiting; the physician is satisfied as to his diagnosis because it stares him in the face. Paresis of the ciliary muscle does not, but its results are frequently the same, with the added possibility that the conjunction of these symptoms with a hypermetropic disc may suggest an intracranial tumour.

If neurasthenia corresponds to a lowered efficiency of the battery it is obvious that there are two lines of treatment—the one to increase the efficiency of the battery, say by suggestion; the other to give the battery less to do, say by putting the patient to bed. A patient suffering from head injury or shell shock is usually put to bed and rested in every possible way; almost the only organs of his body upon which any constant voluntary effort falls are his eyes. At first the mere stimulus of light may be intolerable to him, and he lies with his eyes shut as far as possible; later he may be comfortable except when he changes his position. His next step is probably an attempt to read, and the difficulties of near vision are added to those of distant vision; when he gets up more frequent changes of position cause a recrudescence of his giddiness, headache, and nausea. In fact, throughout his convalescence his chief energies are, consciously or unconsciously, being spent upon his eyes, because without the use of his eyes he can do little or nothing, and

during all his waking moments a large proportion of his diminished available energy is being spent upon them, the result being that the rest of his body is starved. Various functional effects follow, and the patient falls a ready victim to organisms normal to the body and their toxins. But by correcting the refractive error the work which the eyes have to do can be reduced to a minimum and a much smaller strain put upon the battery. It cannot be too strongly insisted upon that refractive errors are almost universal, and only require care and patience to find. The effect of accurately correcting them in acute cases is dramatic, and if patients with head injury or concussion are not rapidly improving, their refraction should be estimated under atropine (unless it is contra-indicated) while they are still in bed, and accurate glasses supplied as soon as possible. If a stock of circular cylinders with frames to fit them is kept this can be done immediately; spheres may be fastened in front of cylinders with thin strips of strapping. The glasses should be stopped as soon as possible for distant vision, but continued much longer for near work.

It is absurd to ascribe neurasthenic conditions to errors of refraction, but refractive errors are basic factors, and their accurate correction breaks a vicious circle. The facts are hard to explain except on the hypothesis that there are two centres of energy, each supplying all the structures of one half of the body. Unilateral symptoms—for example, functional hemiplegia, hemianaesthesia, hemianosmia and hemiageusia, unilateral nerve-deafness, headache and head noises, the more exaggerated knee jerk, the more functionally limited visual field, unilateral or the worse tremors, convulsions and acroparaesthesiae will, with very few exceptions, be found to be on the side of the eye with the more work to do; usually on the side of the eye with the greater of two different errors or with the more abnormal of two approximately equal errors.

The earlier the refraction is corrected the easier it is to do, the more likely the correction is to be effectual, and the more willing the patient is to wear the glasses. The nature of the error does not matter in the least—everything depends on the accuracy of the correction. The object to be aimed at it is to leave a minimum, and as far as possible equal, amount of error for each eye to correct. An over-correction does no good and may do a great deal of harm. If the astigmatism is not fully corrected the probable result will be the conversion of, say, a compound hypermetropic astigmatism into an artificial compound myopic or mixed astigmatism. It is useless to attempt this kind of work without an unlimited supply of patience. Atropine is almost essential, and no fixed standard, such as $\frac{1}{2}$, should be accepted. Most patients can be made to read $\frac{1}{2}$ and many $\frac{1}{4}$ under atropine. It is absurd to say that a patient will read $\frac{1}{2}$ when he comes out of atropine; very likely he will, but at the expense of his nervous system. With simple astigmatism the results are almost certain; mixed or compound cases are much more difficult. Whether the patient is complaining of his eyes or not makes no difference. Giddiness is far more diagnostic of ciliary paresis than is headache. It is no great compliment to Weir Mitchell to adopt his system of rest cure, which, with suggestion, is the usual line of treatment in these cases, and to ignore his pioneer work on the paramount importance of eyestrain.

My work is on the lines of that of Dr. George M. Gould of Philadelphia; but I have formed my conclusions entirely on my own results, and I only read his *Biographic Clinics* a few weeks ago.

A CONFERENCE on sanitary administration under war conditions will be held in London by the Royal Sanitary Institute on June 8th and 9th. The subjects selected for discussion in the mornings are the maintenance of the standard of municipal sanitation and the Mental Deficiency Act. Visits will be paid to certain public works in the afternoons.

A SOCIETY for the scientific study of infancy from the biological, psychological, and clinical points of view has recently been established at Naples on the initiative of Professor Cacace, founder of the Istituto Nipioigienico, which comprises departments of medical consultations for infants, *gouttes de lait*, crèches, maternity wards, provident funds for mothers, instruction in motherhood and puericulture, and laboratories for the examination of milk, and the biological and hygienic study of sucklings.