We hope that Mr. Ridley's scholarly article will be read by all ophthalmic surgeons; Middlemore himself was keenly interested in the history of medicine, and it is a subject that none of us can afford to overlook.

ABSTRACTS

I.—PERIMETRY AND VISUAL FIELDS

Hill, Emory.—Cases of bitemporal contraction of the visual fields. *Amer. Jl. of Ophthal.*, Vol. VI, No. 4, April, 1923.

The author contributes a paper based on forty cases seen in the past three years, which presented fields indicating pressure on the chiasma. He discusses the cases under the following headings: Hypopituitarism; recurrent convulsions with hypopituitarism; pituitary headache; pituitary disturbances in relation to infections; hyperpituitarism; cerebral syphilis; hydrocephalus, and tumours. Under pituitary headache, he points out that such cases are for the most part hypopituitarism, with headache as the most conspicuous symptom: the headache is deep seated in the temporal regions. His cases of hypopituitarism, twenty-seven in number, gave a history of headache in seventeen; nine of these confessed to bitemporal pains, and of the nine, six had epileptiform attacks and in three of these six the attacks were associated with severe bitemporal pains. Such cases have slight bitemporal contraction of the fields, with the characteristic upper temporal slants. Three illustrative cases of pituitary headache are described.

In his conclusions, the author dwells on the value of perimetry in the early diagnosis of slighter disorders situated in the region of the chiasma, and on the secondary effects caused by hydrocephalus. Large test objects are useless to bring out the finer changes in the fields; the use of very small white or coloured test objects is urged; these often reveal tendencies towards bitemporal hemianopia. Enlargements of the blind spots, relative scotomata in the upper temporal quadrants and blurred temporal peripheries in which a large white disc is not recognised as white, but merely as a moving object have been specially frequent in his series of cases and these deserve special mention as precursors of temporal hemianopia.

R. R. J.
II.—WOUNDS AND INJURIES


(1) Brunetière and Amalric record a case which must be rare. A soldier was struck on the left eye and eyelid by a piece of a gun-tube. The piece of metal was removed at a general hospital by a careful surgeon who was particular to cause as little further traumatism as possible. It is not stated from where exactly the foreign body was removed. At any rate there was very free haemorrhage and both lids were much ecchymosed. The piece of metal was 1.5 cm. long and weighed approximately 2 grammes. Very fortunately it was decided to leave the question of enucleation of the eye to the specialist.

When seen at the special hospital it was found that there was arterial haemorrhage which did not yield to pressure or to hot irrigations with alcoholized water. Nevertheless there was some vision. The tension seemed to be diminished but was difficult to estimate owing to the condition of the lids.

Under chloroform the scleral wound was found to be about 10 mm. in length, sharp and clean, and extending from near the limbus nasally in a horizontal direction, towards the caruncle. There was no escape of vitreous and the authors concluded that the deeper membranes were not involved in the lesion. Blood was escaping freely from the wound. The bulbar conjunctiva having been excised on each side two very fine silk sutures were passed through the superficial layers of the sclera. Haemorrhage ceased at once, a compress was applied and the patient put to bed. The bleeding returned very soon, less abundantly, however, and at the end of an hour again ceased. The question of enucleation was then finally put aside. The subsequent history was uneventful. Some days (exact number impossible to determine from the context) after operation the deep sutures were removed, and the conjunctiva, having been freshened, was sutured over the wound. Vision improved to 1/3 before the patient was evacuated. The fundus could be seen but not very distinctly owing to some vitreous opacity. Nothing to suggest retinal detachment. A month or two later reports indicated that the tension was normal, the vision 4/10, no choroidal or retinal lesion visible, though there were still a few flakes in the vitreous. The authors conclude that the very abundant haemorrhage came from the long posterior ciliary arteries, which
had been cut clean by the sharp clean fragment. The case is undoubtedly a fortunate one, doubly so in that primary enucleation was not practised, and in that it was throughout skilfully treated.

**Ernest Thomson.**


(2) In an earlier communication* Terrien and Cousin published some figures illustrative of the gravity of wounds of the eyeball. Of 561 soldiers admitted to hospital for wounds of the eyeball from all varieties of missiles, shell fragments, bullets, grenades, etc., they found that in 60 per cent. almost complete loss of vision resulted, and in 40 per cent. a visual acuity of no more than 1/10 was retained. de Laperonne‡ in a paper on the same subject has drawn attention to the frequency and gravity of small wounds of the eye received in war. Since these notes were published, trench warfare, without lessening the frequency of ocular lesions had led to a greater proportion of wounds by grenade splinters. The authors have tabulated the cases of wounds of the eye from this cause, seen at the IX Ophthalmic Centre, during a period of 18 months.

Of 452 wounds by splinters, 116 were caused by exploding grenades, and 326 by shells. The splinters from the latter are generally small. Of the 116 cases of grenade wounds, the results as to vision were:

- Complete loss of vision ... ... ... 70
- Vision reduced to perception of light ... 33
- " better than 1/10 ... ... 13

These figures, especially when compared with those given at the beginning of this article indicate the seriousness of wounds of this kind, leading to loss of useful sight in as many as 89 per cent. of the cases.

The penetrating particles are generally so minute that they are not discoverable by radiography, and are often very difficult to find in an eye which has been excised.

**J. B. Lawford.**


(3) **Posey** relates two cases of eye injury from lightning. In the first one the lens was observed from the very beginning (by

another practitioner) gradually to become opaque, the opacification first appearing as a faint scratch on the posterior capsule. Four months later a needling was performed by Posey, but the result is not known at the time of writing. In the second case (also seen in the first instance by another practitioner) there was smarting and burning of the eyes, lacrimation, blepharospasm, injection of conjunctiva, contraction of pupils, while vision was reduced to hand movements at a few inches. At this date ophthalmoscopic examination was very difficult, but so far as could be seen the media were clear and optic discs normal. Cerebration was impaired and there were choreiform movements of left arm and hand. When seen by Posey a few days later the choreiform movements had ceased and cerebration had cleared. The right visual acuity was merely light perception and the left, hand movements. The blepharospasm having yielded and the pupils being dilated by the use of atropin it was found that there was a diffuse haze of both retinæ with oedema. There were no haemorrhages or extravasations and the lenses were clear. Strychnine, which had already formed part of the treatment, was continued. Vision progressively improved till, after a little more than a month from the injury, it was normal and the field unrestricted. Posey next considers the literature, which is scanty, and finds that the majority of reporters cite some disturbance to the lens, and this varying from localized opacities to fully developed cataracts. There have been various theories to account for the lens affection, for example, direct physico-chemical action upon the lens substance (Leber); rupture of the capsule (Yvert); direct burn of the lens (Knies); and the theory of Hess. Hess considers that the opacities of the lens and atrophy of the optic nerves are produced, not like the external injuries by the action of heat, but by the power possessed by the electric discharge to kill living cells even without the development of heat: the lens epithelium is killed. Posey points out that owing to the possibility of fundus damage the prognosis as to the results of operation for lightning stroke cataracts must be very guarded. Needling appears to be the operation of choice, and nothing should be done until every trace of ciliary irritation has subsided.

Ernest Thomson.

(4) Beauvieux (Bordeaux).—Bilateral traumatic rupture of the Sclera. (Rupture traumatique bilatérale de la Sclérotique.)

(4) Ruptures of the sclera resulting from non-penetrating wounds in battle have been quite exceptional. Beauvieux has seen only the case now reported. Lagrange draws special attention to their rarity.
Beauvieux's patient was one of thirty men in a dug-out, about 500-metres behind the front line. A 105-shell penetrated the roof of the shelter and burst about 2 metres from him, to his right and a little behind. The man, who was seated at the time, fell over on his left side, felt as if violently slapped on the face, and became blind immediately. The right eye showed a long crescentic subconjunctival rupture of the sclera in the ciliary zone above and to the nasal side of the cornea; this eye had no perception of light. The left eye was similarly but more extensively ruptured, two-thirds of the circumference being involved in two nearly continuous lacerations. This eye retained perception of light. The author is of opinion that the bilateral ruptures in his case are best explained as a result of air-concussion due to an enormous and sudden alteration in atmospheric pressure caused by the explosion of a projectile of large calibre at a short distance, and in a limited space.

J. B. Lawford.


(5) Bramley-Moore considers that minor injuries to the eyelids from broken spectacles are fairly common, and that injuries to the eye itself are more common than a perusal of the literature would suggest. In the last eleven years in Montreal he has had eight cases of injury to the eye from broken spectacles, and in one case the eye had to be removed. In two cases prolapsed iris had to be excised, in three cases the injury was not dangerous. In five of the cases, defective vision was present. One was in a child with strabismus. One case had high myopia. One case had an amblyopic eye and the good eye was injured, losing the lens. Four of the cases were wearing spectacles and four eyeglasses. The author states that eyeglasses are much more easily dislodged than spectacles and narrates an accident that happened to himself when he was struck by a baseball on its first bounce which came with great velocity, striking the outer edge of his eyeglasses and the outer edge of the upper orbital ridge. The glasses were torn off and thrown some feet, but were not broken and his eye was undamaged. In a second accident while smashing wood on a camping trip, a piece flew up and struck the outer edge of his spectacles a severe blow. The side struck broke off at the nose-piece and disappeared in fragments, while the remainder of the spectacles kept in position and his eye was undamaged. Eyeglasses are probably safer than spectacles, but are rarely suitable for children. In the case of adults working as machinists glasses are a great protection and for those working on emery wheels they are indispensable; in Canada, it is against the law to work on an emery wheel without a pair of
protective goggles. It is a great pity that some law of this sort is not put in operation in this country. The author makes no mention of the advantage of lenses ground in triplex glass.

R. R. J.

III.—MISCELLANEOUS


(1) This is a long paper with a full bibliography; it is founded on a case in France in 1917 which was under the care of the author. A sergeant was crushed beneath an overturned motor truck and suffered a violent compression injury of the lower part of the chest and of the abdomen. On admission to the Base Hospital he was conscious and answered questions intelligently. The face was markedly oedematous and of a deep violet colour; this discoloration extended up to the line of the hair, involved the ears and neck and extended over the upper part of the thorax, where, however, it was less marked. Upon this violet background were many petechial haemorrhages. The eyes were closed and could not be opened voluntarily, due to oedema of the lids. On separating the lids a complete bilateral subconjunctival ecchymosis was seen. The lips were swollen and blue-black, the mucosa of the tongue and mouth and the external auditory meatus showed the same discoloration.

There was no serious thoracic injury present, but the pubis was fractured and the bladder was distended with blood. The rent in the wall of the bladder was sewn up and the wound of operation in the anterior wall of the viscus was closed without drainage, extravasical tamponade was used to control the bleeding, and the fractured pelvis was firmly strapped. Recovery was uneventful, but when the oedema of the lids had cleared up the man found that he could not see. The ophthalmoscope showed a bilateral retinal oedema and massive haemorrhages scattered over each disc and macular region. The patient eventually became quite blind, the fundus showing optic atrophy with attenuation of the vessels. More than two years later the man called on Heuer in Baltimore; he had been trained at a school for the blind and had become a skilful masseur.

Heuer reviews the literature of this subject touching on the general side of it, but going into detail with regard to the ocular manifestations and visual disturbances.
This injury is always due to a severe compression of the thorax or abdomen or both together; the name is derived from the characteristic discoloration of the face and neck; at first sight this appears uniform but close inspection shows that the blue-black background is studded with small petechial haemorrhages. The livid tint fades away over the upper part of the abdomen and is strikingly absent at points of pressure, such as where the collar band or hat brim has been situated. The colour fades away usually in a couple of weeks and does not behave like an ordinary bruise. Subconjunctival ecchymosis has been noticed in nearly every case, these show the usual chromatic changes as they clear up. Bodily injuries are usually severe and may be of any nature from fracture of the bones to rupture of the lung or of an abdominal organ, and injuries to the cord or peripheral nerves.

Many of the reported cases having terminated fatally, examination of sections of the skin has been occasionally undertaken, and, as a general rule, the sections have not shown any marked extravasation of blood into the dermis, and the idea is favoured that the livid colour is due not to extravasation of blood but to venous stasis with paralysis of the vessel walls. Some experimental work has been done by Vogt and Perthes on rabbits and this is referred to in the article. As regards treatment, venesection is indicated, and as regards mortality, of the 127 cases included by the author in his paper, 27 died almost at once from the severity of the injury; of the 100 cases which survived the initial injury, 92 recovered and 8 died.

With regard to the ocular complications, it has been frequently noted that retinal haemorrhages are rare. In this series, subjective visual disturbances were found in 16 cases in all; three other cases complained of failing vision at a later date; these 19 cases are briefly abstracted. In 53 of the cases in this report no mention is made of any visual failure, in 21 cases it is definitely stated that there were no visual disturbances. In six cases the loss of vision was immediate but the return was very rapid; in eight cases impairment of vision in one or both eyes was immediate, and in all but one permanent. In three cases there was no immediate loss, but subsequent impairment resulted. As far as the records go impairment or loss of vision has in the majority of cases been associated with retinal haemorrhage; five cases show that exceptions to this rule occur. Orbital haemorrhage accounts for the conjunctival ecchymosis which is practically always present and for any exophthalmos which may be present. Ocular palsies have been noted in some of the patients. Ophthalmoscopic examination was made in 44 of the 127 cases; in 11 of the 44, retinal haemorrhages were found, and in another case in which the retinas were examined post-mortem, haemorrhages were present; oedema was found in
6 cases. Perimetric examinations were made in only 7 cases, in two a central scotoma was present and in four cases there was contraction of the field. Seven cases of the series suffered from permanent impairment or complete loss of vision which has most often been due to a progressive optic atrophy; in some cases it is postulated that there have been degenerative changes in the retina, the result of vascular stasis with oedema. A footnote records that, since writing his paper, the author has met with the report of another case, which occurred in a deep sea diver; no notes of any ocular disturbance are, however, recorded with regard to this last case.

The bibliography runs to 68 items. It has only been possible to give the barest outline of this subject in our abstract, those who wish for further details should consult the original article; they will be amply repaid for any trouble that they may be put to in so doing.

R.R.J.


(2) Ladd-Franklin's paper urges the more universal recognition and teaching that there are four colours in the spectrum, red, yellow, green and blue, and proceeds briefly to review the theories on colour vision.

The author regrets that even yet the public have not freed themselves from Newton's conception of seven colours, his reasoning, in her opinion, being aesthetic. To quote from the paper: "the spectrum is counted in wave lengths about an octave long: in the music octave we recognize seven notes, so why not assign seven tones also to the colour octave?"

Helmholtz established three primary colours, but his theory in the author's view is pre-psychological and pre-evolutionary, while Hering's theory, though recognizing four distinct colour sensations, is pre-evolutionary.

A quotation from Troland's "Enigma of Colour Vision" on these two conceptions is given: "The Young-Helmholtz theory is preferred by physicists because it lays emphasis primarily upon the stimuli to vision, while the Hering theory receives more attention at the hands of the psychologists because its fundamental conceptions are derived from introspective analysis."

The evolutionary idea is then discussed, and can be briefly stated as "the development of a greater and greater specificity to the electro-magnetic vibrations of the visible spectrum." The evolutionary steps may be thus enumerated: (1) Achromatic vision, that is, a white sense only found in lower animals—complete
colour-blind individuals—peripheral retinal vision. (2) Dichromatic vision, perception of yellow and blue found in bees (v. Frisch) for example—partial colour-blindness—mid-peripheral retinal vision. (3) Tetrachromatic vision, an added perception of red and green.

The author, while admitting yellow, the controversial fourth colour, to be a secondary product, is convinced that it and white, also a secondary product, are "perfectly good unitary sensations."

E. Maxwell.

(3) Weekers, L. (Liège).—Light-Sense, Form-Sense and Colour-Sense. (Vision de la Lumière, des Formes et des Couleurs.) Arch. d'Ophthal., August, 1921.

(3) Is the anatomical basis of these subdivisions of the sense of sight identical? This question arises in every clinical observation of their dissociation.

Weekers publishes details of a case in which there was complete abolition of vision for form and colours in both eyes, contrasting strikingly with the retention of perception and projection of light. His patient was a healthy man, aged 37, severely injured in a mine accident. He was unconscious for about an hour. When he recovered his senses, his vision was unaffected. Sight began to fail about one month later; it deteriorated gradually until, after an interval of six months and rather suddenly, he became blind.

When he came under Weekers' observation, he could not perceive objects or the movements of any object, with either eye; but his perception and projection of light were prompt and accurate in all parts of the field of each eye. He responded to this test whether carried out by an ophthalmoscope mirror, electric lamp, a candle or match. The pupils were unequal; both were irresponsive to light and to accommodation. There was convergent strabismus of 20°, and the ocular movements were limited in all directions. The optic papillae were pearly white and presented the appearances of simple atrophy.

Syphilis and other constitutional diseases were excluded by rigorous investigation. Radiographic examination revealed a notable opacity at the base of the skull, in the median line, involving the sella turcica, the body of the sphenoid and the adjoining portion of the temporal bone. These findings and the onset of visual failure some time after the accident render it most probable that there had been a fracture of the cranial base, followed by a descending atrophy of the optic nerves induced by pressure on the tracts or the chiasma.

Following the notes of his case, the author discusses the various hypotheses which have been advanced to explain the dissociation referred to, but at too great length for reproduction here. He adheres to the view that the dissociation bears a definite relation to
the severity of the lesion in the optic radiations or the cortical centres. If the destruction of the nervous elements is incomplete they may retain some part of their functions in slight degree, or a partial restoration of function may ensue. In favour of this suggestion is the fact that the order in which the visual functions disappear is constant; first the chromatic sense, then the sense of form, and lastly perception of light.

J. B. LAWFORD.


(4) McCallie, here states that noting variations in the results obtained when using Snellen letters, and the illiterate "E" tests, he made a careful investigation into the visual acuity of 470 pupils of a grammar school in New Jersey.

He used the letters and the "E" of a size constructed to be seen at 16 feet by the normal eye, and all the tests were carried out under similar conditions. The results with Snellen letters showed 18.6 per cent normal vision, 15.5 per cent. above normal, 65.8 per cent. subnormal: with the "E" 3.9 per cent. normal, 82.2 per cent. above normal, 8.1 per cent. subnormal. He also found that 13.75 feet was the average distance at which 688 eyes saw the 16 foot letters, and 23.2 feet the 16 foot "E". He attributes these discrepancies to the fact that with the "E" the observers, having only to determine in which direction the opening lies, discern it too readily, as it is the brightest side of the figure. Searching for a substitute for the "E" he made use of the accepted fact that the normal eye can just discern an object subtending one minute angle, the vertex of the angle being at the nodal point.

This allows an object just visible to the normal eye at 20 feet, a diameter of 0.0698 of an inch.

His substitute for the "E" consists of a set of cards (illustrations shown in the paper), containing figures of children and animals holding rings, in the centre of one of which in each card, is a dot 0.0698 of an inch in diameter. The ring and dot in the case of small children can be spoken of as rattle and balls.

By two hundred children who saw 20 feet Snellen letters at an average of 22.20 feet, this dot was visible at an average of 20.90 feet. In addition to this strong suggestion of greater accuracy in determining visual acuity on the part of the dot tests, the author considers that it tends to eliminate guess-work. A familiarity with the general form of the letters may enable the observer, without seeing all the component parts, to name a letter correctly: in the case of the dot, judgment is solely passed upon whether there is, or is not, a retinal sensation produced by it.

E. MAXWELL.

(5) **Jess** gives notes of a patient who was injured by a grenade explosion four years before any serious trouble made its appearance in the eye. At that time a spark from burning wood flew into the eye and caused a slight burn of the lower lid which rapidly healed but was followed by inflammation of the eyeball and defective vision. When seen by Jess the eye was suffering from severe irido-cyclitis. He was unable to find any scar in the cornea but found in the centre of the lens immediately beneath the lens capsule a typical greenish fire opal (*Sonnenblume*) opacity about 3 mm. in diameter with numerous rays extending to the periphery. The central part of the lens was clear but beneath the posterior capsule there was a greyish-white opacity which glittered a golden red with the slit-lamp. With the aid of the corneal microscope numerous similar opacities were to be seen in the vitreous. Vision was reduced to 4/50.

Radiography revealed a foreign body situated down and out in the ciliary region. As the sideroscope and the magnet had no influence on it, and as the eye got steadily worse, enucleation was performed. The foreign body was found to be copper. There was no injury to the lens and the foreign body must have entered through the sclera and remained embedded in the ciliary body.

The copper deposit in the lens reacted with ferrocyanide of potash and acetic acid, and lay in the space beneath the lens capsule. (Coloured plates illustrate the histological appearance.) The glistening cataract appearance (*Scheinkatarakel*), seen by focal but not by transmitted illumination, was due to the deposit that lay between the epithelium and capsule. This deposit was in the centre about 5μ thick but only about 2μ at the sides.

The point of interest is how the copper reached its position. The deposit was richest in that part of the lens that corresponded with the pupillary opening and was in contact with the aqueous.

Jess considers that the copper salts were dissolved in the aqueous and diffused through the epithelium, but were held up by the capsule and so spread laterally under the epithelium. He considers that the copper salt formed in the eye was in all probability a basic carbonate. He was, however, unable to reproduce the typical copper cataract experimentally in rabbits' eyes, although he made numerous experiments with different copper preparations.

Jess concludes his paper by pointing out that the deposit of copper in such cases throws some light on the normal diffusion
CURRENTS OF THE LENS. A bibliography and two coloured plates accompany the paper.

E.E.H.

(6) Aubineau and Opin.—Glioma of the retina resembling iridocyclitis. Early involvement of the ciliary body and iris. Buphthalmos. (Gliome rétinien à forme iridocyclitique avec envahissement précoce du corps ciliaire et de l'iris et buphthalmie.) Arch. d'Ophtal., April, 1922.

The authors publish clinical and histological notes of a case, one of a comparatively small group, in which the clinical appearances are so atypical that an error in diagnosis may and occasionally does occur and in some cases is determined only after removal of the eyeball. In this instance the clinical signs which at first misled the observers were briefly as follows:—the globe was of normal size and tension, but tender to touch; there was marked conjunctival and pericorneal injection; the cornea was quite clear and through it were visible masses of yellow and red material, thought to be composed of pus and blood, which filled the anterior chamber. The condition was thought to be either tuberculosis or metastatic iridocyclitis.

Four months later the eyeball had become buphthalmic, the anterior segment having become much enlarged; the anterior chamber was still filled by yellowish red material with a semi-liquid appearance. The eye was then excised and histological examination showed the existence of a typically gliomatous growth which had invaded the iris and ciliary body so that these structures were scarcely recognisable. The child died two months later with meningeal symptoms.

Aubineau and Opin have searched the literature and have found a small number of similar cases and append a list of references.

J. B. Lawford.


Kiep has used butyn in 2 per cent. solution in some fifty cases, including seven of trephining, four of iridectomy, one of cataract, and one of application of the cautery for corneal ulcer, and of thirty-six (by infiltration-anaesthésia) of trichiasis and of van Millingen's operation. He was completely satisfied with the results. Butyn should not be used with chlorides, such as adrenalin chloride, but this difficulty may be got over by combining it with epinephrin. All traces of alkali must be absent from instruments, bottles, etc., since alkali causes immediate precipitation of butyn.

S.S.