OPTICS AND REFRACTION

ABSTRACTS

I.—OPTICS AND REFRACTION


In 1924 Fincham published (Trans. Optic. Soc., Vol. XXVI, No. 5, 1924-5, extracted in the Brit. Jl. of Ophth., Vol. IX p. 524, 1925), a paper on the changes in the form of the crystalline lens in accommodation, and drew attention to the varying thickness of the capsule of the lens and its probable action in producing the well-known "lenticonus," discovered by Tscherning, which occurs at the anterior surface of the lens during accommodation. Here it was suggested that thicker and stronger parts of the capsule will resist distension and so cause the surface to be flattened, whereas bulging will take place where the capsule is thinner; consequently, during accommodation the tension upon the surface is relaxed and the capsule becomes distended by the pressure of the lens substance, the distension being most marked where the capsule is weakest.

The author now returns to the subject and, in an able and interesting paper, continues the discussion.

Method of Investigation.—Nearly all the observations were carried out on the lenses of animals, and so it was not possible to correlate the form of the lens during accommodation in life with the curves of the surfaces of the lens when removed from the eye. The aim was to record the characteristic contour of the surface of the lens when held by its normal suspensions and also when allowed to assume its free shape.

The method of making these records was to photograph the image of a target as reflected in the surface. The target was of peculiar design so that its image produced by a convex spherical surface was square. The target was fixed at a constant distance from the surface examined and the camera directed directly downwards.

The following observations were made:

1. The cornea and iris were removed, the eye supported in a cup-shaped vessel and the lens bathed in normal saline solution. The image of the target in the anterior surface of the lens was photographed after excess of saline solution had been removed.
2. Similar photographs were taken after the following dissections:—
   (a) The posterior half of the eye was removed and the cut surface of the vitreous supported by a flat surface.
   (b) The zonule and vitreous connexions of the lens were severed and the lens left lying on the vitreous.
   (c) The lens was removed and placed in a little cup of plasticine approximately the same curvature as the posterior surface of the lens.

The eyes examined were from the pig, sheep, reindeer, rabbit, monkey (four species), baboon (two species) and one human eye from a patient of seventy years.

The Form of the Lens when removed from its Suspensions.—It is assumed that the influence of the capsule upon the form of the lens will be greatest when it is unflattened by the tension of the zonule; and according to the hypothesis of Helmholtz in a state of maximum accommodation.

It was found that, in animals lower than the primates, the anterior surface of the lens was approximately spherical, whilst in baboons and monkeys it had the characteristic conoidal form of the accommodated human lens. The image from the lens of a human subject aged 70 years showed marked barrel distortion, indicating that the surface was more steeply curved in the peripheral zones. This lens was quite rigid, and the radius of curvature of the central part of the anterior surface 9.4mm., quite a normal value, in the unaccommodated eye. This also proves that the reduction in amplitude of accommodation is due to sclerosis of the lens.

The Effect of Alteration of Tension upon the Lens.—In the lower animals the images were very similar before and after the lens had been freed from its connexions with the suspensory ligament. In the baboons and monkeys, on the other hand, there was a remarkable difference in the two conditions. The anterior surface of the lens was noticeably flatter when held in suspension; when released not only did the lens increase in curvature in its centre, but the conoidal form of the surface became more marked.

It is noted that no actual proof exists that the freed lens is in the state of maximum accommodation, although this has been assumed.

The Thickness of the Lens Capsule.—In the lower mammalia the capsule was approximately uniform in thickness over the anterior surface, and in each case was quite thick at its centre. The lens capsule of monkeys showed the same general type of variation in thickness as is found in the human capsule.
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The Effect of Removing the Capsule.—In order to test the effect of the capsule upon the form of the lens photographs in profile were taken with and without the capsule. The lens was removed from the capsule intact (as proved by subsequent sections of the capsule). The soft lens was immersed in castor oil so as to prevent distortion. In all cases the soft lens removed from the capsule became flattened, and it was also noted that the lens substance could be easily distorted by pressure with a hard object and always returned to the same form.

Conclusions

1. The lens surface increases in curvature, and assumes the accommodated form, when released from its suspensions.

2. The conoidal form of lens surface is found only in those cases where the anterior capsule has a relatively thin central area surrounded by a zone of greater thickness.

3. The primate lens loses its characteristic accommodated form when the capsule is removed.

4. The amplitude of accommodation is small in those animals which have an anterior capsule of uniform thickness.

The Value of the Conoidal Surface in Accommodation.—A few observations have been made to show that the pole of the lens moves forward 0.25mm. to 0.50mm. during accommodation, whereas the equatorial diameter is only reduced by 0.50mm. and the peripheral parts of the surface remain stationary. For an accommodation of 8D. the radius of the curvature of the central part of the anterior surface of the lens changed from 12mm. to 5.5mm. If the whole surface of the lens were affected in this way it would need a much greater reduction in the equatorial diameter of the lens. It is thus seen how advantageous is the conoidal deformity produced by accommodation.

The Capsular Theory of the Mechanism of Accommodation.—The change which the form of the lens undergoes when the capsule is removed appears to indicate that the effect of the capsule is to compress the lens substance around the equator and in the zones of greatest thickness. Such a compression would cause the central bulging of the anterior surface which is typical of the accommodated lens.

The lens removed from its capsule appears to be in the unaccommodated state. May we not infer that when an eye is not accommodated the compressing force of the capsule is neutralized or held off by the traction of the zonule? The process of accommodation would then consist of the contraction of the ciliary muscle releasing the tension from the zonule, which in its turn releases the capsule.
and allows it to mould the lens into the accommodated form. This power will necessarily decrease as the lens grows harder and more resistant in later life.

According to the Helmholtz hypothesis the accommodated condition of the lens is the natural form of the lens, and the lens remains in its unaccommodated form by the constant traction of the suspensory ligament, yet we know that the lens grows harder in later life and should therefore produce myopia by being fixed in the accommodated condition, which is not the case. Apart from this it has seemed unnatural that the lens in the unaccommodated condition should not be in a state of rest.

Fincham suggests that the lens substance (which is less readily distorted in later life), is in its natural form when unaccommodated and that the process of accommodation consists of the contraction of the ciliary muscle releasing the tension of the zonule which in its turn releases the capsule and allows it to mould the lens into its accommodated form.

All credit is due to Fincham for showing us that the peculiar conoidal form assumed by the lenses of primates during accommodation, is wholly explained by a relaxation of the zonular fibres owing to the special thinning of the central part of the capsule that is found in them. The relaxed primate lens loses its characteristic form when the capsule is removed.

Unfortunately Fincham has been unable to obtain any young human eyes. If any reader could send an uninjured young eye in normal saline to E. F. Fincham, Northampton Polytechnic Institute, London, in order to complete his work, I am sure he will be most grateful.

I have abstracted this paper at some length not only because of the ingenuity of the investigation, but because this paper (together with that published in 1925) seems to me to place the Helmholtz hypothesis beyond doubt.

**Charles Goulden.**


(2) **Essed and Soewerno** have performed a series of experiments on apes which tend to confirm, in the authors’ opinion, Levinsohn’s theory of the aetiology of myopia. It will be remembered that in this writer’s opinion one of the most important factors in the aetiology of myopia is the action of gravity upon the globe of the eye. The authors took six apes and placed them in boxes, so that their heads hung down from a hole in the side, with an arrangement by which they were prevented from looking up.
They were confined there for periods of several months. Two showed little or no change, one after six months and the other after two months confinement. In the others the original hypermetropia turned into a myopia, the myopic change being from 1 to 1.5D. Controls showed negative results.

W. S. Duke-Elder.

(3) Frenkel, Henri (Toulouse).—Unilateral myopia. (La Myopie monolatérale.) Arch. d'Ophthal., April, 1928.

(3) Frenkel is of opinion that unilateral myopia is more common than is generally known; he refers to the not infrequent discovery of it in applicants for pension or compensation who have been quite unaware of the difference between the two eyes until they come up for examination. His paper is largely statistical, with tabular arrangement of figures obtained from hospital and other clinical sources. In the tables he shows the numbers of cases of symmetrical myopia, of myopia with unilateral predominance, and of purely unilateral myopia. The relative numbers in the two sexes and at ages from 5 to 70 years are also given. Unilateral myopia appears to be more frequent in females than in males and on the right than on the left side.

In reference to the question of heredity the author states that while it is easy to show that myopia is hereditary it is difficult to prove inheritance in the unilateral myopia: he gives notes of a few illustrative cases.

In his concluding remarks Frenkel discusses the question of correction of refractive errors, in high degrees of anisometropia; he notes that, if correction is begun at an early age the subjects of unilateral myopia show a remarkable tolerance of correcting lenses differing by as much as 4 to 6 dioptries.

A bibliography containing 19 references is appended.

J. B. Lawford.


(4) In an investigation into the physical type of 188 myopes, Incze found that 72 per cent. (136 cases) were of the asthenic type. He considers this no coincidence, but regards myopia as an expression of generalised weakness of connective tissue throughout the body—holding this view in spite of the fact that in earlier investigation as to the refractive condition of asthenic people, he found that myopia was present in only 13 per cent. of asthenics. As supporting the view of a constitutional basis of myopia, the

Birnbaum has written a long reasoned article, which would lose much of its force in an abstract. The term "school myopia" he interprets as "myopia acquired at school, as a consequence of school work." In his opinion the widespread belief in school myopia has no reliable foundation and he attacks it vigorously. His facts, statistics and deductions are well arranged and form interesting reading. His personal view is that "the evolution of myopia and of refraction of the eye generally should be considered as ontogenetic; an evolution determined in the embryological stage, as is true of the form and colour of the moustache which, also developing long after birth, is yet determined in the germ cell"

J. B. Lawford.


Lancaster's article concerns a case of cyclophoria in a well-to-do professional man aged 47 years, who was unable to read for more than 10 minutes at a time, although he wore an adequate correction for his error of refraction. Tests with a Maddox rod, vertical in front of one eye and horizontal in front of the other, showed about 20° of positive cyclophoria. This apparently did not trouble him in distant vision, but made reading intolerable. The patient would not consent to read with one eye covered, so he was referred to Professor Ames, who devised an exceedingly ingenious apparatus which gave him relief. It is based on the following observation:—

"Hold a hand-mirror vertically before you, but at an angle of about 45° with the line of vision and a few inches from the eye . . . then vertical or horizontal lines on the wall behind you will appear vertical or horizontal in the mirror. Now tilt the mirror so that it is no longer vertical, the image is moved up or down and the vertical or horizontal lines are tilted. By interposing a second mirror parallel with and facing the first, it is possible to make the eye see the image of objects in front of it instead of behind it and, by putting in a prism, to correct the upward or downward displace-
ment produced by the tilting of the mirror. One more correction has still to be made if the apparatus is to be used for reading, because the image as seen by the eye using the mirrors is noticeably smaller than that seen by the other eye, owing to the longer path of the rays. This is overcome by interposing two lenses whose effect, figuratively speaking, is to carry the nodal point of the eye forward. The whole apparatus is easily accommodated in one side of a spectacle frame, and screws are provided so that the required degree of torsion in the image may be maintained. The patient for whom the instrument was made obtained complete relief from the first day, and has now been using it for over a year with the greatest satisfaction.

F. A. WILLIAMSON-NOBLE.


(7) Velonoskiascopy is a subjective test based on the following observation. If an ametropic eye views a vertical white line against a black background, the line appears blurred. If a vertical thread be now held in front of the eye, a central black interval will appear in the image, the width of the interval varying with the amount of ametropia. In cases of astigmatism, a cross with the lines set at the principal axes of the astigmatism may be employed instead of a single line, and cross wires may be held in front of the eye, the wires being parallel with the arms of the cross. Black intervals are now seen in both arms of the cross, and if astigmatism be present, one black interval will be wider than the other. The astigmatism may then be estimated by the strength of cylinder required to make the two black intervals of equal width. In cases where the position of the cross wires and the cross does not correspond with the axes of the astigmatism, the black interval appears to cut obliquely across the white line instead of bisecting it. In practice a wall chart consisting of a circular disc of red cardboard 49cm. in diameter is employed; it bears a cross consisting of two strips of white paper 4mm. wide and 38.5cm. long. On the other side is a series of radiating white lines, placed at 30° intervals and used to determine the axes of the astigmatism. When this has been found, the chart is reversed and hung in the appropriate position. In the trial frame there is placed a black disc, with a central hole 6mm. in diameter, occupied by two cross wires 0.5 or 1.0mm wide, the lines of wires being made to coincide with the arms of the cross and to intersect at the centre of the pupil. Morsman advises the performance of a preliminary retinoscopy to give an idea of the amount of error. This is then overcorrected with spheres so that the patient is made 1 or 1.5D. myopic in the major meridian, and
he is told what to look for. Minus cylinders are now introduced with their axes along the line of the broader interval until equality is reached. The fogging sphere is then reduced, note being made whether the dark areas remain equal in size all the time. The test calls for the exercise of considerable powers of observation on the part of the patient, and this, of course, is its chief drawback.

F. A. Williamson-Noble.

II.—GENERAL MEDICINE


(1) Meisirow's case was that of a woman, 3 months pregnant, who had lost 20 lbs. in two months, and was complaining of backache, headache and dimness of vision which began at the second month of her pregnancy. The ocular findings were: R.E. disc blurred, vessels narrow, fresh exudate 2 mm. wide at the macula, involving retina and choroid. L.E. thin haze in lower part of cornea, disc blurred, fundus otherwise normal. Two days later the central exudate had increased in size, and about the sixth day pigment was developed in the papillo-macular bundle, i.e., between the disc and macula. The eye condition became worse in spite of eliminative treatment during the next fortnight, so the uterus was emptied. Progress of the disease was arrested and vision gradually improved from perception of light to 4/10 in each eye. Four months later, an irregular white area was found about 2/3 D.D. just below the macula with some pigment at its upper border—remnants of the ribbon-like pigmenitary change which had developed in the papillo-macular bundle. It is notable that there was no sign of renal involvement in this case. The author concludes his article by quoting Zentmayer's rule: "If retinitis develops before the sixth month, pregnancy should be terminated. If at the eighth month, carry to full term. Between the sixth and eighth month be guided by the visual disturbance. If vision is poor, terminate pregnancy."

F. A. Williamson-Noble.

(2) Hebert, Dr. (St. Quentin).—Two cases of neuro-retinitis in the course of pregnancy. (Deux cas de neurorétinite au cours de la grossesse). La Clin. Ophtal., February, 1928.

(2) It is difficult to know how to describe the two cases related by Hebert. Both were cases of distinct neuro-retinitis, both
occurred in the course of pregnancy, both had arterial hypertension, both showed only traces of albumen in the urine, both were such as to lead to induction of labour. Yet the one presented retinal haemorrhages, while the other did not. The case with no retinal haemorrhages proved to be a typical case of retinitis of pregnancy and recovered; the other had a syphilitic basis and, after a partial recovery following delivery, died totally blind a year later. The author draws no decisive conclusions and admits that the cases do not help us much to understand a condition "of which the precise aetiology still escapes us."

Ernest Thomson.


(3) Krauss and Spikes' case is of interest, particularly in showing that a stye may not always be what it seems. The patient, a piercer of yarns, had noticed a small swelling on the right upper lid for two days. It increased enormously, in spite of treatment, and the side of the face became swollen. A deep incision made in the upper lid produced only a blood-stained discharge and cultures were negative. The swelling became hard and brawny, and the edges of the wound somewhat necrotic.

Cultures now showed a few cocci. The condition rapidly became worse, Cheyne-Stokes respiration developed, the neck became rigid, and the hands and fingers athetoid. The cerebro-spinal fluid was found to contain cocci and anthrax bacilli. Pulmonary oedema then developed rapidly and the patient died within thirty-six hours of admission to hospital. Post-mortem there was found a suppurative meningitis due to anthrax with extensive oedema and haemorrhage in all the deeper structures. A feature of the case was marked absence of pain, in spite of the swelling and inflammatory changes.

F. A. Williamson-Noble.


(4) Constans' paper opens with a short review of the literature on pemphigus, in which it is pointed out that prior to Cooper's description of the disease in 1858, ocular pemphigus was unknown as an entity. The cause is unknown and the fluid in the blebs has been found to be sterile. Four types of pemphigus are described:

(1) Acute, which is often fatal, runs a rapid course and is associated with severe general symptoms; (2) Chronic, in which there may be successive crops of blebs; (3) Vegetant, in which the bullae
become converted into excoriations in which vegetations grow; (4) Foliate, which is gradually progressive and almost always fatal, the lesion affecting the skin and mucous membranes, and healing slowly. In ocular pemphigus, the symptoms comprise xerosis, the formation of blebs, associated usually with itching and burning of the eyes. The condition is usually bilateral and, in a late stage, marked shrinkage of the conjunctiva occurs with dryness of the cornea and loss of vision. The treatment is merely symptomatic and comprises the use of a bland lotion and oil.

Three cases are described:—The first occurred in a married woman, aged 53 years, who noticed itching of the eyes followed by swelling, of the lids and severe chills in July, 1925. The temperature rose to 104° F. and there were general manifestations of pemphigus. The skin exfoliated from the lids and a greyish exudate formed over the palpebral conjunctiva. The general condition improved, but the cornea became involved in the middle of August and showed sloughing of the superficial layers which went on to perforation and formation of hypopyon ulcers. In October the conjunctiva was still injected, the right cornea was hazy and showed facets, while the left was nearly normal, except for a central nebula from the old ulcer. In November, the conjunctiva was found to be replaced by milky-white new connective tissue, and there were numerous adhesions between the globe and lid. In the second case there was general pemphigus with swelling of the lids, but no corneal involvement or conjunctival adhesions. The third case was one of primary pemphigus of the eye. The palpebral conjunctiva of both upper lids showed irregular scars with red areas of denuded epithelium and there were adhesions. The corneae were clear. Nine months later there was scarring and vascularization of the left cornea, and seven months later still, small “mutton fat” deposits were found in the substantia propria.

F. A. WILLIAMSON-NOBLE.


(5) The case described by Stein was that of a boy, aged 15 years, who had chronic otitis media in the left ear. An acute exacerbation developed in which a paralysis of the sixth nerve became evident on the opposite side. The post-mortem examination showed that he had a thrombo-phlebitis of the cerebral sinuses.
which started in the left sigmoid sinus, and travelled up to the left cavernous sinus, through the circular sinus, to the right cavernous sinus. From there it travelled to the orbital veins and produced an orbital cellulitis on the right side, while, on the left side, the thrombosis was limited to the cavernous sinus and caused no apparent symptoms.

Stein takes the opportunity of reviewing the ocular complications, which were met with in 850 cases, of suppurative otitis media. Of these 795 had no cerebral complications, while 55 had.

Otitis media without cerebral complications—795 cases.

Nil in eyes—724 cases (91.1 per cent.)
Hyperaemia of disc—bilateral 31 cases (4.1 per cent.)
  homolateral 25 cases (3.0 per cent.)
  contralateral 2 cases (0.2 per cent.)
Optic neuritis—bilateral 7 cases (0.9 per cent.)
  homolateral 6 cases (0.7 per cent.)

Otitis media with cerebral complications—55 cases.

Nil in eyes—36 cases (65 per cent.)
Hyperaemia of disc—bilateral 8 cases (14.5 per cent.)
  homolateral 7 cases (12.5 per cent.)
Optic neuritis—bilateral 4 cases (8 per cent.)

W. S. Duke-Elder.


(6) In this useful article for general practitioners by Maitland Ramsay a few points may be picked out which the ophthalmic surgeon sometimes forgets.

Persistent autotoxaemia is always accompanied by a state of increased blood-pressure. Hyperpiesis therefore must be regarded as a symptom rather than as a disease. Hyperpiesis always is followed sooner or later by sclerosis of the walls of the arteries. Marcus Gunn has pointed out that old age does not of itself cause arteriosclerosis, but that it is always secondary to some cause capable of inducing and maintaining high blood-pressure. Sclerosis of an arteriole causes starvation of the capillaries which it feeds, and in consequence the retina suffers from want of nutrition. In these circumstances the walls of the capillaries soon become damaged, and much of the subsequent trouble can be traced to this cause. In the case of the retina, impaired nutrition
causes defective vision, which is indicated in the first instance by disturbance of the light sense, accompanied by disordered perception of colour. Capillary diapedesis, haemorrhage and oedema are the first milestones on the road ending in destruction of tissue. In the retina the whole pathological process culminates in atrophy of the optic nerve.

Although the occurrence of intraocular haemorrhage makes little difference to the prognosis with regard to life, yet it greatly increases the danger to sight. Obviously the amount of damage depends upon the size and the site of the haemorrhage. Small scattered flame-like extravasations in the nerve-fibre layer of the retina are, as a rule, never alarming, and unless they are very numerous the patient may be unaware of their existence until they are revealed by ophthalmoscopic examination. They usually become absorbed, but unless the underlying toxaemia can be eliminated or controlled, they are almost certain to recur, consequently crops of haemorrhages in different stages of absorption are frequently seen in the fundus over a period of months or years. On the other hand, when instead of being striate or flame-shaped the blood clots are more or less circular in outline and situated deeply in the retina or in the macula, the regular mosaic of rods and cones will be damaged and sight seriously and permanently impaired. Retinal haemorrhages are largely of the nature of capillary leakages and therefore differ from cerebral haemorrhages, which occur when an arteriole with walls weakened by arteriosclerotic changes bursts.

Mott has pointed out that advanced arteriosclerosis with normal blood-pressure may exist in the retina as it does in the brain. In such circumstances the independence of the capillaries must never be overlooked, because although systolic blood-pressure may be below normal, capillary pressure may be much above normal. When structural changes predominate in the retinal vessels and there is deficient capillary circulation, caution must be observed lest strenuous attempts to lower a high arterial pressure impair still further the already inadequate capillary circulation. A sudden fall in blood-pressure is likely to precipitate the occurrence of retinal haemorrhage, which in these circumstances is frequently the precursor of a general breakdown in health.

A. F. MacCallan.


(7) In two columns of the Lancet MacGillivray ably summarises the various causes which have been put forward to
explain this mysterious disease, and relates a tragic case of his own. The patient was a man aged 28 years, first seen on May 20, 1924. Up to the previous day he had had perfect eyesight. Quite suddenly a dense cloud came over the left eye. The vitreous was found to be filled with blood obscuring any view of the fundus. The vision was only P.L., that of the right eye being 6/6. The patient was not a bleeder and knew of none such in his family. His own doctor reported nothing in the general condition to account for the haemorrhage. Potassium iodide was given and under this the haemorrhage began to clear up, only to recur as badly as ever seven weeks after the first attack. Once again nothing was found in the general condition, but the blood coagulation time was found to be slightly lowered. Calcium lactate was substituted for the iodide. Six months later, there having been no further intraocular bleeding but several slight attacks of epistaxis having occurred, a clear view of the fundus was obtained. The V.A. was 6/60. "A narrow sickle-shaped band of white fibrous tissue was seen arising from and obscuring the optic disc. This fibrous band extended towards the macular region and projected some distance into the vitreous. The macula itself was not involved, the band curving below it to end in a fine point some two discs' breadth beyond. Several newly-formed blood-vessels were to be seen curling irregularly over the white mass and projecting into the vitreous." The author explains the formation of fibrous tissue as coming from the mesoblastic tissue of the blood-vessels, such fibrous tissue formation occurring in Eales's disease though not, as a rule, in vitreous haemorrhages of other types. By cicatrical contraction the bands may drag upon the retina, with the result that the retina becomes detached. This is what occurred in the author's case. Relapses occurred, and by December, 1925, a large blood-stained detachment of the retina could be made out. The patient was not seen again until February 8, 1928, when similar conditions, though not detachment, were found in the right eye, these apparently dating from an attack of sudden blindness a month previously.

The author makes the interesting statement that in May, 1926, the patient was admitted to hospital under W. E. Foggie for special investigation as to the nervous system. The following is a transcription of the note:—"He was found to have retention of touch in the right arm, the right side of the trunk, and the right leg, but analgesia and thermo-anaesthesia over the same area. There was some stiffness and weakness of the left leg. With the knowledge of recurrent intraocular haemorrhages in the left eye the condition was diagnosed as a haemorrhage into the spinal cord in the lower cervical region—a haematomyelia, with probably some pressure on the pyramidal tracts of the left side. The Wassermann reac-
tion was negative. The electrical reactions of the limbs were normal. The other systems were normal. Blood pressure 140/105. Blood coagulation time: 75 seconds—i.e., lower than normal. The patient was very nervous and his general outlook gloomy." The author, naturally, gives a grave prognosis for, although actual detachment has not yet occurred in the right eye, this is likely to occur as in the left eye. Finally, it should be mentioned that at one period in the case injections of haemoplakin were tried but these failed to control the intraocular haemorrhagic relapses.

ERNEST THOMSON.


(8) Clegg gives an interesting sketch of the relation of ophthalmology with general medicine. He mentions that interesting fundus condition, lipaemia retinalis, which occurs in young subjects and in which death almost invariably soon occurs. Foster Moore (Trans. Ophthal. Soc. U.K., Vol. XL) recalls two cases from the literature on the subject in which recovery occurred and the fundi became normal in appearance. In a case under the care of Dr. Arnold Stott at Westminster Hospital which showed the typical appearances of lipaemia retinalis, complete return to a normal fundus condition occurred under dietetic and insulin treatment, and the young man is carrying on a normal life five months after he came under observation.

A. F. MacCALLAN.


(9) Stenhouse-Stewart records in this note a case of amaurotic family idiocy which proved on investigation to represent the second generation of the classical R—family recorded by Kingdon of Nottingham. He states that his object in recording this case is twofold. First, the appearance of the disease in the second generation, and, if it should occur elsewhere in the family, the importance of determining if the heredity is solely through the female side. Secondly, what advice should be given to the remaining members of the family with regard to future children.

We reprint his genealogical table and references.

E. E. H.
GENERAL MEDICINE


Eight miscarried or died, not apparently due to A.F.I.

June, 1885 | April, 1886 | Oct, 1900 | Apr, 14, 1892 | May 6, 1893 | Nov, 1894 | Nov, 1895 | Sept, 1897 | Feb, 1900 | ? Aug, 1904 | Aug, 1907
---|---|---|---|---|---|---|---|---|---|---

1921 | 1921 | April, 1921 | Mar., 1926 | Expected April, 1929

* Other members of this family have no abnormal history so far as is known.
§ Transactions of the Royal Medical and Chirurgical Society of London, LXXX, 87.
© Ibid, Addendum.

(10) This paper is a record of Worms's and Sourdille's study of three varieties of microbic intestinal disorder in the course of which ocular lesions are not infrequently present. An epidemic of bacillary dysentery afforded them unusual opportunities.

The causal relation of various forms of enteritis to ocular lesions has been so extensively studied since Trousseau's paper appeared in 1894, that there is little noteworthy in the present communication, apart from some interesting clinical records. In the bacillus coli group ocular complications are limited almost entirely to the tissues of the uveal tract and to the external tunics of the eyeball. In dysentery two forms of ocular lesions have been observed; sclerocconjunctivitis and plastic iritis. Clinical notes of 12 cases under the writers' observation are given. Much less is known of the toxic effects of the enterococcus, and the references by Worms and Sourdille are taken from the work of Heitz-Boyer, who reported acute conjunctivitis (bilateral) in the late stage of enteritis, the enterococcus being identified in the faeces and urine.

J. B. Lawford.

III.—RETINA


(1) The localisation of glycogen in the retina has been the subject of much diversity of opinion among writers, and the early researches of Schmitz-Moormann himself also showed very great variation in the situations where it was found, to such an extent that he concludes that this variability in its distribution can only be due to a post-mortem deposit of the glycogen and to faulty fixation.

By adopting a fresh method of fixation for frog's eyes he found that the glycogen was confined to the myoid, the contractile inner
segment of the cone; and, to a small extent, the adjoining cone stalk (saphenstiel). With this carbohydrate reserve and its power of contraction the myoid possesses characters similar to those of muscle fibre. The presence of this glycogen-reserve makes it extremely probable that the change from chemical to kinetic energy on contraction of the myoid takes place in the myoid itself. The resulting chemical products of metabolism are to be regarded as the expression of this change of energy on the contraction of the myoid. The products that stimulate the retina on the action of light, so far as the cones are concerned, are furnished by the myoid itself.

He thus thinks it possible to bring the two opposing theories for the contraction of the cones, the chemical and actinic, into substantial agreement.

As regards the extension and contraction of the rods and the old question of their active or passive movement Schmitz-Moormann shows that they are entirely devoid of glycogen, and therefore have no contractile part similar to the myoid of the cones. Hence he concludes that their movement is essentially passive.

Thos. Snowball.


(2) An interesting case of a girl, aged 19 years, who, several days after a fall, lost the sight of the right eye. In falling, she had received a blow on the left parietal region, resulting in a cut which, however, did not require to be stitched. There was no concussion and the patient was able to go on with her work for several days, though she felt heavy-headed and tired in the eyes. There was some pain on movement of the eyes which gradually increased. It was only on the 8th day that the sight of the right eye became badly affected and the headache became intense, but it was not till the 17th day that she came under observation. When first seen, right vision was reduced to finger counting at 40 cm. The visual field was reduced to 20° and there was paresis of the right internal rectus and right superior oblique. The disc showed definite papilloedema with haemorrhages (measurements not given). The left eye was normal and vision full. While under observation she developed a typical macular fan. The most interesting point, however, about the case was that she also developed on the nasal side of the disc an area of choroido-retinitis. Vision ultimately returned to full normal, but the visual field showed a large scotoma in the temporal area corresponding to the patch of choroido-
retinitis. X-rays revealed a small contrecoup fracture of the base involving the sphenoid.

The interesting features of the case are (1) the comparatively late development of papilloedema and visual loss in a case of traumatic haemorrhage into the nerve sheath, and (2) the development of a choroido-retinitis juxta-papillaris in association with a papilloedema.

Leslie Paton.

(3) Beach, Sylvester Judd (Portland, Maine).—Treatment of obstruction of the central retinal artery. Amer. Jl. of Opthal., May, 1927.

(3) Beach is inclined to regard this lesion as due to "endarteritis obliterans, often more or less complicated by spasm or thrombosis" rather than to embolism. He gives details of a case seen by him in 1916, which occurred in a woman aged 52 years. There was sudden and complete loss of vision in the left eye, followed half an hour later by marked recovery in the upper field though the fixation area was still obscure. Ophthalmoscopically there was complete stasis in the superior retinal vessels; there was no evidence of spasm and no cherry red spot at the macula. Forcible intermittent pressure with a circular motion was performed for some minutes with a resulting increase in the area of field. The operator endeavoured to make the release of each push very sudden so as to give a forcible recoil. One hour after the attack the patient could see objects in all directions, though hazily, and eventually she regained 6/5 vision and a field nearly full except for a little contraction on the temporal side. Physical examination was negative and in particular there was no evidence of valvular disease. Beach has collected from the literature a series of 32 cases of recovery after obstruction of the central artery. Of these, 15 recoveries followed massage, 7 operation (iridectomy or paracentesis, sclerotomy), 2 the use of drugs (amyl nitrate and potassium iodide), 3 were spontaneous, and the remainder were treated by a combination of methods. The evidence from these cases shows that iridectomy or paracentesis is well worth while doing if massage is a failure, and von Pflugk had one remarkable case in which he obtained almost complete recovery after repeating his paracentesis for nearly three weeks (number of operations not stated). The inference is, that in these cases the nutrition of the retina is maintained by seepage of blood past the block in the vessel and that no case should be given up until treatment has been persevered in for a very considerable period.

F. A. Williamson-Noble.

Villard and Dejean describe clinical and histological findings in the case of a woman aged 71 years, who lost the vision of the right eye by thrombosis of the central artery of the retina and not by embolism. The presence of evidence of endocarditis favoured a diagnosis of embolism, but on the other hand the history was suggestive of thrombosis. The loss of vision was preceded by brief attacks of obscuration which increased in frequency and in severity until finally the eye became totally blind. At the time of examination of the patient there was vision = 1/50, optic disc very pale, retinal arteries very narrow, no macular oedema and no foveal red spot. Two months later acute glaucoma supervened with complete loss of vision in the affected eye. Enucleation was performed. Histological examination of serial sections showed a large organised mass in the central artery. The mass was closely adherent along a thinned roughened area of arterial wall where the endothelium was missing and the elastic tissue interrupted. The histological evidence was therefore incontrovertible, that thrombosis had occurred gradually, starting along a longitudinally placed area of ulceration of the intima.

Humphrey Neame.

Barkan, Dr. Hans (San Francisco).—Air embolism of the retinal vessels. Arch. f. Ophth., July, 1928.

Before describing his own case Barkan reviews the literature of the subject and quotes a most interesting account by Beecher of ophthalmological observations made in a monkey which had air injected into its carotid artery. Almost immediately after injection, silvery bubbles and air columns were observed to shoot along the retinal arteries which in one or two seconds became completely filled with air. At the same time the papilla became pale and very soon after the entire fundus was seen to be traversed by innumerable very fine glittering lines which represented the capillary network of the retina. Barkan’s own experiments were made with rabbits in which air was injected into the right ventricle. The immediate effect was to produce clonic convulsions and the appearance of bright silvery rod-like particles shooting along the retinal vessels, to be followed by “an almost volcanic eruption of air” which within a few seconds delineated the entire arterial tree as a brilliantly shining object. Numerous emboli were also seen in the choroidal vessels which became almost entirely white. The article concludes with an account of air embolism in a man following an operation on the lung. The fundus was not examined till some
months afterwards when it was found to be normal, though there was a scotoma in each field of vision due probably to partial destruction of the cells in the calcarine cortex.

F. A. WILLIAMSON-NOBLE.


(6) It has been established that recurrent haemorrhages into the vitreous and retina, seen in adolescents, are almost exclusively due to a tuberculous periphlebitis in the retina. Suganuma shows that clinical, pathological and experimental investigations go to prove that this periphlebitis is in general a primary affection in the eye. His findings disprove the view, held by some writers, that this condition arises secondarily from a tuberculous lesion in the anterior portion of the globe by way of the lymph stream, but he admits that this may be a possible mode of origin in exceptional cases. The tubercle bacilli, according to the author, are carried to the eye by the circulation from tuberculous foci in other parts of the body, and in all probability pass into the perivascular lymph space from the post-capillary portion of the blood vessels, when they settle down in the most favourable sites, and form specific nodules round the vein.

THOS. SNOWBALL.

BOOK NOTICES


This, the fifth French edition of May’s Handbook, corresponds to the latest, i.e., the twelfth, American edition, of 1927. In view of the numerous manuals and treatises on ophthalmology by French writers, the call for a fifth edition of this book is indicative of its wide acceptance by French students and others. This is no doubt partly due to the author’s successful effort to combine brevity and clarity in his writing.

In arrangement this book does not differ noticeably from most small handbooks. It is essentially practical and little space is given to discussion of theories or knotty questions. Moreover, only a very