malpraxis to slit the canaliculus or to pass a probe. So we excised the sac, an operation which was often extremely satisfactory not only as regards the removal of a septic focus but also in that lacrymation afterwards was not so troublesome as might be expected. But still we—speaking purely in an impersonal sense—we were not satisfied so went a step further and developed various operative procedures to obtain free drainage into the nose. What is the result? At a recent meeting of the Section of Ophthalmology of the Royal Society of Medicine a paper was read by a well-known ophthalmic surgeon on methods of operating in cases of suppurative dacryocystitis. These methods involved the making of an opening through the sac into the middle meatus of the nose. To judge from the report of the proceedings in our contemporary the Lancet (June 27, 1925) the proposals were received with what one might almost call a chorus of disapproval.

In order to avoid personalities for the present, we may put it that the voices in the chorus expressed the following opinions: That epiphora must still exist after the operation; that there was danger of a fistula from the nose to the face after the operation; that after West's operation the opening tended to close up and the patient was no better than before; that there was liability to general infection of the ethmoid cells. Have we, as usual, gone too far and must we retrace our steps? The answer is difficult.

ABSTRACTS

I.—ACCOMMODATION


(1) The original object of the investigation, so Fincham tells us, was to determine the form of the lens in various states of accommodation. It was hoped that from measurements of a number of eyes a set of curves could be plotted which would show the thickness of the lens and the radii of its surfaces for every state of accommodation in the average eye.

A number of preliminary measurements were made upon the radius of the anterior surface of the lens in different eyes, but it was found that this value varied over a wide range for the same condition of accommodation. Two cases were found, both males of the same age and having an equal error of refraction; the
Accommodation

Anterior surfaces of the lenses in the two cases were of nearly equal radius when at rest, but behaved quite differently during accommodation. The examination of these two cases forms the basis of the paper.

Measurement of the Radius of Curvature of the Anterior Surface of the Crystalline Lens.

(a) Observation of the surface and its alteration during accommodation.—The author observed that the convex form of the anterior surface of the lens can readily be seen when illuminated by the slit-lamp. Further, by observing the lens obliquely with the microscope while the beam of the slit-lamp was directed along the optic axis of the eye, its anterior surface could distinctly be seen to increase in curvature when the subject made a large effort of accommodation.

No direct measurements could be made owing to the oblique direction of observation through the peripheral part of the cornea. Apparently this is the first time that this observation has been made.

(b) Nature of the Images reflected from the Anterior Surface of the lens.—Fincham found that the distinctness of images formed on the anterior surface of the lens varied a great deal in different subjects, but he found one in whom the images from both the anterior and posterior surfaces of the lens were so distinct that he was actually able to photograph them.

The illumination in this case was obtained by reflecting on the eye the light of a naked arc by means of concave mirrors, giving the effect of three sources of illumination. In order to secure the pupil large enough to exhibit all the images, a shutter was placed in front of the arc lamp, and was released simultaneously with the shutter of the camera. As the length of the exposure was only 1/5th second, it was completed before the light had caused the pupil to contract.

The photograph of the accommodated condition was made whilst the subject was viewing a near object placed upon the original line of sight, so that the direction of the eye was the same in both cases. An ingenious arrangement whereby this was brought about will be explained a little later.

(c) Measurement of the Radius.—For this a simplified form of Tscherning's ophthalmomaphakometer was used, details of which need not be mentioned.

The radius of curvature of the cornea was measured with the Javal ophthalmometer.

The two cases selected for study were of the same age, 19 years. The error of refraction was equal in each case, 1 dioptre manifest...
hypermetropia, and both were free from astigmatism. There was, however, a difference in the amplitude of accommodation. In the case H, both uniocular and binocular amplitudes were 11 dioptres, while in case M, the uniocular amplitude was 11.5 dioptres and the binocular 13.5 dioptres.

Fixation was secured by directing the subject to look steadily at the centre of a cross scratched in fine lines upon the back of a small mirror. This was placed at the correct distance from the eye for the particular test and was adjusted so that it reflected to the subject's eye light from a window which was behind his head.

The small mirror with the cross scratched upon the back was used as the fixation object throughout. When it was desired to observe the changes in the lens in the act of accommodation, the mirror was directed so that the image of a distant lamp behind the subject's head was seen by him in the mirror, in line with the centre of the cross. The eye which was not under observation was covered, and the subject was able to accommodate either for the distant lamp or for the surface of the mirror without moving the axis of the eye.

The curves obtained by plotting the measured radii of curvature against the amount of accommodation exercised, showed a considerable difference in the two cases. Beyond about 4 dioptres the case H altered the curvature of the anterior surface of the lens much less than the case M, for an equal amount of accommodation.
THE DEPTH OF THE ANTERIOR CHAMBER.

In the study of accommodation, changes in the position of the anterior lens surface relatively to the cornea are of interest, from two points of view. In the first place a change in the position of this surface will modify the dioptric power of the eye, quite apart from alterations in its curvature, and so must be considered as one of the possible factors in the production of accommodation. Secondly, in considering the problem of the mechanism by which these changes in the lens are produced, the more nearly we can determine the movement of each part of the surface, the more exactly shall we be able to estimate the disposition of the forces which are responsible for the change.

Fincham has made his measurements by means of a combined corneal microscope and slit-lamp of special design, a description of which will be found in this journal (February, 1925). He points out quite properly that the reflected images produced by the surfaces of the lens have rather lost their interest since the introduction of the slit-lamp as we are now able to examine the surfaces themselves.

Direct readings by this method naturally only gave the apparent depth of the anterior chamber, consequently calculations were necessary to find the real depth of the anterior chamber.

He was able to prove the forward movement of the anterior surface of the lens as was originally stated by Helmholtz.

THE FORM OF THE ANTERIOR SURFACE OF THE LENS.

For the purpose of observing the phenomena of the alteration in curvature of the anterior surface of the lenses in the eyes of the two cases (H and M), the pupils were dilated with homatropin and cocain, and the observations were made before any considerable paralysis of the accommodation had become manifest. The illumination was supplied by focussing upon the eye the images of a "Pointolite" lamp produced by five small concave mirrors, which were mounted upon a metal arc held vertically before the eye.

In the case H, when the accommodation was relaxed, the row of images from the anterior surface of the lens formed a straight line close to the edge of the pupil. When the eye accommodated 6D, the row became smaller, but remained straight. It appeared from this observation that in this particular eye the anterior surface of the lens approached closely to the spherical form when at rest, and was not greatly distorted under the influence of accommodation.

The eye of the case M showed a remarkable difference in this respect. While the subject was viewing a distant object the line
of images assumed a marked curve, and when he accommodated 6D. without altering the direction of the visual axis the three central images fell upon a straight line, showing that the portion of the surface producing them was approximately spherical, whereas the images at the two extremes showed a remarkable splaying, characteristic of a reflection from a conical surface.

From these observations it appeared that the anterior surface of the lens in this eye (Case M) in the unaccommodated state varied from the spherical form by a flattening, commencing probably beyond about 2 mm. from the axis. When this eye accommodated, the lens surface took on the form of a shallow cone having its apex rounded into a spherical curve extending over an area about 3 mm. in diameter. Normally only this spherical portion was exposed by the pupil.

**The Peripheral Depth of the Anterior Chamber.**

These observations necessitated the determination of the form of the corneal surface through which the observations were made. For this purpose the method suggested by Dr. Drysdale for measuring the radius of curvature of small surfaces was employed.

The peripheral depth of the anterior chamber was then measured with corneal microscope and slit-lamp at a point 1.5 mm. from the limbus. To secure that the light was incident normally to the corneal surface, the instrument was adjusted so that the beam of light reflected back from the cornea fell upon the centre of the projecting lens of the illuminating tube. The microscope was placed close to the illuminating tube so that observation and illumination were made through, as nearly as possible, the same part of the cornea.

**Increase of Thickness of the Lens in Accommodation.**

In measuring the apparent thickness of the lens in the two cases (H and M) by means of slit-lamp and microscope, it was necessary to consider the cornea and the anterior lens surface as one lens system through which the observations were made. The change in depth of the anterior chamber and the radius of the anterior surface of the lens were taken into account in order to ascertain the power of the combined system in the accommodated state.

In Case H the increase in thickness was 0.58 mm. in passing from 1 to 9D. of accommodation; and in Case M, for the same amounts of accommodation, the figure was 0.38 mm.

**Movement of Posterior Pole of Lens.**

An increase in accommodation of 8D. was accompanied by a backward movement of the posterior pole of the lens of 0.24 mm. in Case H, and of 0.09 mm. in Case M.
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THE RADIUS OF CURVATURE OF THE POSTERIOR SURFACE 
OF THE LENS.

An increase in accommodation of 8D. produced a change in 
radius of 0.13 mm. in Case H, and of 0.87 mm. in Case M.

From these results it is seen that, although the posterior surface alters very slightly, its behaviour is similar to that of the anterior surface; that is to say, that in the two cases the surfaces which altered most in radius during accommodation suffered the least movement of their apices. Case H shows the greater movement of both front and back surfaces, whereas, in Case M, the surfaces show the greatest increase in curvature.

CHANGE IN THE EQUATORIAL DIAMETER OF THE LENS.

No conclusive evidence was forthcoming from the examination of a case in which the periphery of the lens was visible along 4 mm. of its extent through an operative coloboma.

FIG. 2.

A diagrammatic representation of a section of an average lens capsule in which the relative thickness of the capsule is magnified 100 times.

THE LENS CAPSULE.

Fincham draws attention to the well-known elasticity of the lens capsule, quoting some of Bowman’s observations.

He then draws attention to an observation by Bowman, but less well known, that the thickness of the capsule is not uniform. A table is copied from Salzmann’s “Anatomy and Histology of the Human Eyeball,” showing the variations in thickness of the capsule, and the appended diagram shows forcibly how very considerable these variations are.

The capsule of the anterior surface has its maximum thickness in a zone 3 mm. from the pole, whereas the capsule of the posterior surface, which is extremely thin over the greater part, reaches its maximum near to the equator of the lens.

Fincham has designed and made a working model of the lens capsule in rubber with thicknesses varying, as they do in the
actual lens capsule. This india-rubber model was suspended by means of thin tapes which were attached to the periphery of both surfaces in such a way that tension could be applied equally and in an approximately tangential direction to the surfaces. Under the influence of tension, both surfaces were nearly spherical, the thinner posterior surface having the greater curvature when the tension was relaxed. The thicker surface assumed a hyperbolic form which was similar to the accommodated condition of the anterior surface of the human lens. The centre of the surface became more steeply curved, while the periphery was flattened. The thinner surface remained practically unchanged in curvature, although the relaxation of tension was equal for both surfaces.

CONCLUSIONS.

In the consideration of the theory of the mechanism of accommodation we must accept the experimental evidence of the increase of the central thickness and decrease of the equatorial diameter of the lens (Grossman). These facts appear to indicate the general truth of the theory of Helmholtz.

Tscherning based his chief objection upon the fact that the surface of the accommodated lens is distorted from the spherical form, a change which is not explained by a simple relaxation of the tension. From a consideration of Cases H and M, it is seen that not only is this change in the figure different in different eyes, but also that the increase in central thickness of the lens is not proportional to the increase in the curvature of its surfaces. In these particular cases it was found that, for an equal increase in accommodation, the surface which suffered the greatest change in curvature showed the least movement of its apex. It was this surface also which showed the greatest variation from the spherical curve in both the relaxed and accommodated conditions. If, then, we are to accept the Helmholtz theory, some factor must be found which will explain the change in the figure of the anterior surface and will also permit the existence of the differences of behaviour in different eyes.

Fincham suggests that this factor is to be found in the combination of the elastic nature and varying thickness of the lens capsule. If parts of the capsule are weaker, they will be distended more readily by the pressure within, and will consequently cause the surface to be more steeply curved in these parts. Thicker and stronger parts of the capsule will resist the distension and so cause the surface to be flattened. He suggests that the resultant lenticonus may be accounted for in the same way as keratoconus, which is caused by a weakening of the centre of the cornea.
Now tension on the capsule will cause it to flatten the surface of the lens. Owing to the extreme thinness of the posterior capsule it will tend to stretch in that part rather than compress the lens substance. This point is borne out by the experimental model already mentioned. Thus it appears that the posterior lens capsule is distended to its utmost when the accommodation is relaxed and consequently does not increase much in curvature when the tension of the zonule is relaxed in accommodation. The advance of the apex is produced by the general swelling of the lens.

If the anterior capsule does not vary much in thickness, tension upon it will cause the anterior surface of the lens to be approximately spherical. This was seen in Case H. If, however, the central part of the anterior capsule be thin, the resultant surface will show a greater curvature in the centre than at the periphery; it will be hyperbolic in curve. This was seen in Case M.

The result of relaxation of tension by an act of accommodation is that the capsule becomes distended by the pressure of lens substance and the distension will be greatest where the capsule is weakest.

We have abstracted this paper at such length because it seems to us to be one of great importance, and one, the argument of which cannot be stated without following the author through his various steps. It seems to us that he has brought forward still more evidence in favour of the Helmholtz explanation of the act of accommodation and has taken away the necessity of any further hypothesis to explain the hyperbolic curve which caused Tscherning to formulate a new hypothesis. The experiments of Hess on the movements of the lens during accommodation and eserin miosis showed quite conclusively that the zonule was relaxed during accommodation, and although this relaxation did not explain the hyperbolic form the lens assumed during accommodation, the variations in thickness of the lens capsule emphasized by Fincham have supplied the clue to this extremely puzzling phenomenon.

The author is to be congratulated upon a very valuable and beautiful piece of investigation.

Charles Goulden.
II.—ANATOMY AND PHYSIOLOGY


Haden’s paper is based on the histological investigation of eyes obtained from nine different foetuses varying from the ages of two and a half to nine months of intra-uterine life. The optic nerve and region of the lamina cribrosa were stained to differentiate between glial and fibrous connective tissue. At the outset, Haden notes a statement in a recent text-book of embryology to the effect that the formation of the lamina cribrosa is due to the nerve fibres growing through the preformed mesodermal layers of the choroid and sclera. His investigations go to prove the falsity of the statement and his findings are as follow: The primary framework of the optic nerve is ectodermal, being composed of glial cells and thin processes. The latter form an arrangement similar to a bundle of tubes within which lie the fibres of the optic nerve. Prior to the middle of the third month, there is no mesoderm within the optic nerve other than that incarcerated with the hyaloid artery. After this date fine endothelial capillaries grow inwards from the anlage of the pial sheath, accompanied by fibroblasts, and follow the direction of the glial partitions. These fibroblasts proliferate, and by the end of the seventh month nearly all the septa between the funiculi of the nerve are composed of fibrous tissue.

The processes of glial cells in the distal end of the nerve are coarser and are not invaded by fibrous tissue until a much later period. Where fibrous tissue does ultimately appear, it is a direct ingrowth of the scleral fibres and occupies only the posterior layers of the lamina, the anterior portion remaining glial throughout life. The paper is illustrated with twelve coloured drawings of microscopic slides.

F. A. WILLIAMSON-NOBLE.

(2) Beauvieux and Ristitch.—The central vessels of the optic nerve. An anatomical study. (Les Vaisseaux centraux du Nerf optique. Étude anatomique.) From the Ophthalmic Clinic of the Faculty of Bordeaux. *Arch. d'Ophthal.*, June, 1924.

Beauvieux and Ristitch conducted an elaborate investigation into the arterial and venous circulation of the optic nerve by means of coloured injections. Their findings are described in detail in this paper, and illustrated by six excellent micro-photo-
ANATOMY AND PHYSIOLOGY

graphs. The paper is interesting but too long to abstract satisfactorily. The following are the writers' conclusions:

"(1) The central artery of the retina is a terminal blood-vessel, in the sense that cerebral arteries are terminal. This is not surprising, since the retina is a cerebral extension and the optic nerve a commissure between the retina and the brain. The central artery is completely independent of neighbouring arterial areas, in the retrobulbar part of the nerve, which it supplies and especially at the level of the scleral ring, the cribriform lamina and the papilla. We know that in the retina each branch preserves its individuality.

"It follows, that it is impossible to explain the re-establishment of blood current which sometimes occurs in cases of arterial embolism or thrombosis by the development of a collateral circulation by way of anastomosing arterioles of the circle of Zinn. This conception has been supported by Sichel, Wecker, Nuel, Knapp, Nettleship, Dufour and Gonin. Although Leber described anastomoses at the level of the cribriform lamina he thought that these communications were too imperfect to allow the central artery to be considered anything but a terminal artery. We are more emphatic, for in no one of our experiments has there been any evidence of such anastomoses. It is, therefore, necessary to imagine that the blood supply flows along some pre-existing channel when the central artery has become blocked. This pre-formed channel can only be present in exceptional instances, as in a case reported by Gonin.

"(2) The cribriform lamina is dependent on the circle of Zinn and the short posterior ciliary arteries for its arterial supply. This statement merits attention. In a future article we shall show that this blood supply offers an explanation of the genesis of Schnabel's lacunae in glaucoma.

"(3) The central retinal vein has communication with the venous plexuses of the choroid and sclera, at the level of the scleral canal, similar to the communications which exist between neighbouring venous areas in the cerebrum. The venous anastomoses are specially demonstrable at the level of the lamina cribrosa, but their calibre is small except in one or two venules. Are they sufficient to take a share in the retinal venous blood flow in the presence of active or passive congestion at the posterior pole of the eye?

"In seeking a reply to this question we have examined numerous specimens of optic neuritis or blood stasis of diverse origin, but have never found pathological dilatation of these secondary channels; nor have we in any case found oedema or congestion of the choroid around the papilla, suggestive of abnormal circulatory conditions in the posterior part of the uveal tract. Conversely, in
studying sections of various types of choroid inflammation we have not noted papillary hyperaemia, which Vennemann states is inevitably induced by way of these venous anastomoses.

"We are of opinion, nevertheless, although it is not possible to adduce proof, that their existence may be valuable in the event of an obstruction to the blood current in the central vein. Thrombosis of the central vein is not rare and a noticeable and not infrequent sequence is secondary glaucoma. To what is the hypertension to be ascribed? Is it possible that these anastomosing venules, divert the retinal blood current towards the choroid or scleral plexus and in this way allow the ocular blood pressure to regain its equilibrium? Or, on the other hand, does hypertonus develop if the canals are quite incapable of performing their physiological task? If it is really so the exact site of the obstructing clot is of paramount importance. The venous anastomoses cannot exert their function unless the obstruction is situated behind the lamina cribrosa, i.e., in the trunk of the optic nerve." Further observations are necessary to confirm or contradict this hypothesis.

J. B. Lawford.

(3) Ferree, Prof. C. E. and Rand, Gertrude (Bryn Mawr College). Effect of brightness of pre-exposure and surrounding field on breadth and shape of the colour fields for stimuli of different sizes. *Amer. Jl. of Ophthal.*, November, 1924.

(3) Ferree and Rand have published many papers on the subject of colour fields, the present paper being one of the series. When a small coloured stimulus, surrounded by a field, for example, of black or white, is viewed, a sensation is given which consists of the colour mixed with black or white, due to a contrast sensation induced by the surrounding field. In consequence, there is (a) a quantitative inhibition of chromatic excitation. In the central retina, with good illumination, white surroundings inhibit the colour most and black least. There is also (b) a qualitative inhibition which varies with the state of adaptation and the part of the retina stimulated. For example, in the light-adapted eye, yellow mixed with black becomes greenish and blue mixed with white or light grey becomes a reddish blue. In peripheral vision, the changes are greater in amount, and not always in the same direction. With regard to pre-exposure, if this differs in brightness from the colour to be used, it gives an after image which mixes with the colour, reducing its saturation and altering its tone. If the pre-exposure is brighter, the effect is to add black to the colours, if darker, to add white. It was found that the eye was rendered most sensitive if the pre-exposure was grey of the same brightness as the colour. It has to be borne in mind that the after
TUMOURS

image reaction of the peripheral retina is extremely quick, and that there is no latent period. Numerous fields were taken with test objects of various sizes, the surrounding fields being black, white or grey of the same brightness as the colour used. The largest fields were obtained when the pre-exposure and surrounding field were grey. This applied to all the colours except blue, in which the small 0.17 degree stimulus was used, when black gave a better result. The reason given for this is that the blue was a close match for the grey.

F. A. WILLIAMSON-NOBLE

III.—TUMOURS


(1) Barnert, before describing his case gives a useful summary of the literature, culled from some hundred and fifty references. With regard to incidence the average age is 18 years. The disease is essentially fatal, the average duration being three to four months. Onset is usually marked by the occurrence of exophthalmos, which rapidly increases and is accompanied by loss of visual acuity. New tumours form in the skull bones and leukaemia develops. There are purpuric rashes and a rapidly progressive secondary anaemia. Tumours may be found in the skin, bones or any of the viscera. The blood picture is that of an acute myeloblastic leukaemia with rapid diminution of the platelets and haemoglobin. There is a close resemblance between myeloblasts and lymphocytes so that the condition may be mistaken for lymphatic leukaemia. Chloroma is essentially a malignant disease of the bone marrow, the type cell being the myeloblast. The tumours extend through the cortex of the bone and spread over the periostenum. The cells are not only carried rapidly to other parts of the body but actually undergo metastasis in the blood stream itself. The light olive-green colour of chloroma is not necessarily present in all the tumours. Its exact composition is not yet known, but it is due to the presence of myelocytes. The colour fades after a few minutes exposure to light but can be restored by hydrogen peroxide or ammonia.

Interesting points in the case reported are: The onset with exophthalmos was noted the day after the patient had been hit in the face by another child. An X-ray photograph taken at one period showed a fracture of the orbit, so that the condition was taken at first for haematoma. At the first exploratory operation only
fibrinuous material was found in the portion removed for examination. The blood picture was that of an acute myeloblastic leukaemia, the polymorphs being reduced to 30 per cent., the lymphocytes not affected, and the myeloblasts and myelocytes being increased up to 25 per cent. X-ray treatment had little effect, and the child died one month after admission to hospital at the age of 2½ years. A chloroma was present in the left orbit, the side first affected, and no fracture was found in the bone. The lungs, suprarenals and kidneys showed some greenish discoloration, bone marrow from the femur was chocolate coloured and semi-solid. No definite tumours were found in the skull bones but there were some greenish areas involving the dura and lining periosteum.

F. A. WILLIAMSON-NOBLE.


(2) Cange and Argaud describe a case of bilocular dermoid cyst in a man of 45 years of age. A tumour had been first noticed at the age of fifteen in the most anterior part of the left temporal fossa near the end of the eyebrow. Three months before the patient came under the care of the authors the tumour had grown rapidly and marked exophthalmos had also developed (a photograph illustrates the appearance). With the exception of a slight contraction of the visual field there were no objective symptoms and the vision of the eye was normal. During the operation for the removal of the cyst, which necessitated a fairly considerable bony resection, a communication was found at the point of junction of the frontal, malar, and great wing of the sphenoid leading to a second cyst in the back of the orbit. Both were successfully removed with an excellent cosmetic result and the recovery of the slight loss of the field of vision. Microscopical examination confirmed the diagnosis of a dermoid cyst. The paper concludes with a discussion of the embryological origin of such cysts.

E.E.H.

(3) Weekers, L. (Liège).—Primary melano-sarcoma of the ciliary body. (Mélanosarcome primitif du corps ciliaire.) Arch. d'Ophthal., October, 1924.

(3) Weekers publishes a description of two examples of this somewhat rare form of malignant tumour of the eye, with illustrations of microscopic sections of the tumours. They are good specimens of two types of sarcoma arising in the ciliary body.
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Case 1.—In a man, aged 65 years; here the tumour developed in the anterior part of the ciliary body and the root of the iris, and invaded the anterior chamber. Pigmentation, especially in the ciliary portion, was moderate in degree.

Case 2.—In a man, aged 24 years; here the neoplasm developed in the pigmented cells of the ciliary processes and invaded the vitreous, forming a pedunculated tumour; in its histological characters it was a true melanoma consisting almost entirely of pigmented cells.

J. B. Lawford.


This report by Donnell concerns a woman, aged 74 years, who in April, 1923, complained of a tumour of the left eye. It had first appeared six years previously as a small lump on the left upper lid over the site of a chalazion which had been incised and curetted. The growth was the size of a walnut and appeared to arise well back under the upper lid. The orbit was exenterated and during the operation it was seen that the growth arose from the tarsus, most of which was absorbed. The chief feature in the microscopical examination of the specimen, was the presence of solid masses of cells of varying size and shape with red blood cells compactly arranged between them. A thin-walled blood-vessel was seen, more or less centrally placed, in many of the cell masses. A similarity is noted between the appearances here and those in glioma retinae, with the difference that in the present case the cells farthest from the nutrient vessel have not only regressed but have also undergone absorption. Giant cells were fairly numerous and in some parts of the growth the alveolar arrangement had broken down, the appearance becoming sarcomatous. The exact origin of these tumours is still sub judice. The existence of the perithelial cells described by Ebbutt in 1870 has not yet been confirmed, as it is difficult to differentiate them from the endothelial cells of the perivascular lymphatics. Clinically, these growths are commonest in the loose subcutaneous tissue of the anal region, orbit, axilla, popliteal space and the regions of the embryonic fissures, but not in the more exposed regions. This suggests "a relation to embryonal disturbance of superfluous tissue." Only three cases of perithelioma have been described in the eyelid.

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F. A. Williamson-Noble.
Ruiz, R. del C. (Madrid).—Lymphosarcoma of the upper lid. (Linfosarcoma del Párpado Superior.) An. de Oftal., January, 1925.

The great rarity with which these neoplasms occur in the lid makes the case described by Ruiz of considerable clinical interest; he has been able to gather only 31 cases of this class of lid tumour in the whole of the world's literature.

There is a history of twelve months, during which time the patient, a young adult male, noticed a slowly-growing, symptomless tumour develop in the substance of the right upper lid. At the end of this period, it had attained a considerable size, and had induced a definite ptosis and narrowing of the palpebral fissure. The skin was quite free and appeared normal, and on palpation was found to be easily movable over a smooth, regular, oval mass of ebony consistency, which lay horizontally across the lid in apparent close relation to the tarsal plate. Eversion of the lid, a manoeuvre which elicited considerable pain, revealed the tarsal conjunctiva in its lower part covered by follicles which increased in size towards the ciliary margin. Several enlarged vessels traversed the palpebral conjunctiva, running from the region of the fornix, and appearing to lose themselves in the substance of the tumour.

In the differential diagnosis, the general appearance and the close relation to the tarsal plate suggested a specific tarsitis, a possibility rendered more probable in this case by the fact of a positive Wassermann reaction, and a definitely specific family history. To exclude this a histological examination of an excised portion was made which revealed a typical lymphosarcomatous structure, with the richly-chromatined atypical cells in active mitotic division.

In discussing the possibilities of treatment Ruiz remarks on its difficulty. Two methods of attack are suggested, excision, and destruction by diathermy followed by a course of radium, or X-ray therapy. Of these the latter was chosen as holding out a fair chance of cure with the minimum of trauma. Were the former considered, the method may be either conservative or radical. The most feasible of the less extensive operative procedures is suggested as a total excision of the upper lid, with a facio-plastic reconstruction after the manner of Fricke, replacing the palpebral conjunctiva by oral mucosa. This is rejected in that it is not ample enough to negative recurrence with any certainty; in that the new lid, being immobile and drooping, would not only fail to protect the globe, but, being of foreign epithelium, and remaining dry in the absence of lacrimal secretion, would so damage the cornea and ocular conjunctiva that the usefulness of
the eye would be sacrificed, and any attempt at its preservation thus nullified; and finally, in that the immobility of the drooping lid would itself forbid vision, and destroy any attempt at an aesthetic result. The more radical alternative—extirpation of the lid and the neighbouring structures, removal of the eye, and sealing over the exenterated orbital cavity by autoplastical procedures—is to be preferred.

W. S. Duke-Elder.


(6) Cohen's case is of interest because it shows that sympathetic ophthalmitis may occur as the result of a melano-sarcoma of the choroid in the exciting eye, apart from any trauma. The patient was a male, aged 35 years, who suffered from multiple arthritis, and had a history of infection with syphilis and gonorrhoea. Wassermann and gonococcal fixation tests were negative and no gonococci could be found after prostatic massage. He was found to have a melano-sarcoma of the left eye, but refused enucleation. Ten months later the eye became inflamed and within four months began to shrink. Three months after this, the right eye which was previously unaffected showed signs of irido-cyclitis, with deterioration of vision which was eventually reduced to hand movements. The left eye was excised and found to contain a melano-sarcoma of the choroid which had become necrotic in some areas and had produced a plastic irido-cyclitis with phthisis bulbi. No micro-organisms could be found and there was no sign of perforation. Though the irido-cyclitis was of the plastic type the typical histological appearances of sympathetic ophthalmitis, giant cells and numerous lymphocytes, were absent. It was considered unlikely that systemic or focal infections caused the plastic irido-cyclitis in the other eye because of: (1) The long period during which laboratory findings for infections remained negative; (2) the long delay of the occurrence of any acute eye manifestations after a history of initial infection; (3) the length of the interval—namely three months—between the involvement of the two eyes. On the other hand, the multiple arthritis was of unknown origin and it was possible that the same unknown infection could have produced irido-cyclitis in the less resistant sarcomatous eye and after an interval in the previously sound and more resistant right eye. The author believes, however, that necrosis of the sarcoma was the cause of the irido-cyclitis in the left eye and the exciting cause of an inflammation clinically like sympathetic ophthalmitis in the other eye. His reasons are: (1) The presence of a plastic irido-cyclitis in both eyes; (2) the sequence in the clinical pathology of
both eyes; (3) the absence of any proof of definite systemic infection, which if present would, as a rule, have produced a plastic irido-cyclitis in both eyes simultaneously.

F. A. WILLIAMSON-NOBLE.

IV.—MISCELLANEOUS

(1) Wojno (Sofia).—A rare complication after a subconjunctival injection of NaCl. (Seltene Komplikation nach subconjunctivaler NaCl-injektion.) (Polish.) Abs. Zentralb. f. d. gesam. Ophthal., May 6, 1924.

(1) Wojno reports two cases, where, after subconjunctival injection of 2 per cent. NaCl, pain, and damage to the corneal epithelium were observed. This quickly passed off. He is of opinion that it is due to a hypersensitiveness of the nerve endings in the cornea. That it is not caused by the cocain included in the injection is proved by the fact of its occurring when the NaCl was injected alone.

S. SPENCE MEIGHAN.


(2) Blatt’s case is remarkable from the fact that the patient attained an advanced age, and therefore belongs to the class of fragilitas ossium idiopathica tarda. The patient was a woman, aged 52 years, who from childhood had had “blue eyes” and difficulty of hearing. In the course of her career she sustained a fracture of the ninth rib with dislocation of the shoulder, further a fracture of the left arm and one of the right thigh bone. Slight trauma was sufficient to produce repeated dislocation of the shoulder. At the age of 50 years a slowly-growing tumour made its appearance in the left eye. Examination showed that this tumour extended from the caruncle to beyond the edge of the cornea, presented the form of a shell, had a broad base and was firmly fixed to the parts beneath. The surface was uneven, but not ulcerated, the colour greyish-white. It had apparently developed on an old pterygium. Removal of the tumour was easy; nowhere had it penetrated into the deeper parts. Histological examination showed irregular epithelial masses, separated by stroma at the cut surfaces. The
cells were partly cylindrical, partly cubical, but flattened types were also observed. A few giant cells, here and there kariokynetic figures. No regressive changes. Obviously, a case of epibulbar carcinoma of the baso-cellular type. In the patient's family fragility of the bones, blue sclerotics and deafness were hereditary, but there was no disposition to the development of cancer. The author believes that the sclera, which in spite of its thinness possessed unusual firmness, must have prevented the tumour from proliferating into the interior of the eye, while the abundant blood supplied by the pterygium forming the base of the tumour probably accounted for the absence of ulceration. The pterygium itself acted no doubt as an irritative cause in the development of the carcinoma.

V. St. John.


(3) Blatt describes a case of unilateral congenital cataract with almost complete resorption of the lens, and incomplete development of the eye and corresponding orbit. The cataract is explainable as a transformation occurring in the later months of uterine development, the consequence probably of a trauma which produced rupture of the pupillary membrane (of which remains were noted), and of the lens capsule. In the absence of the impulse provided by the growing lens the eye and orbit remained incompletely developed. Weakness of sight is also to be explained by absence of developmental impulse with consequent insufficient differentiation of the retina. Amblyopia ex anopsia, with well developed retina, does not exist, according to the author. Conclusion: In order to avoid malddevelopment of the eye, congenital cataract need not be operated on in the first two years, since the danger of amblyopia ex anopsia does not exist.

V. St. John.


(4) Chromheteropia is the name which Koby prefers for the condition usually known in this country as heterochromia. The article is of some length, so that it may be sufficient to condense
the conclusions reached. Heterochromia iridis is most often the indication of degeneration of the eye, with or without affection of the sympathetic. The pathogenesis is obscure. It may be congenital and associated with other anomalies. Sometimes it is the result of unilateral hyperpigmentation, which usually extends to the sclerotic, etc. The cause may be atavism, since the lightly pigmented human races are descended from much pigmented ancestors. An interesting form of heterochromia is produced by what the author terms *hérédité en mosaïque*, translated by the reviewer as "mixed heredity," though that may not be the best translation. This may also be observed in the domestic animals. It indicates repeated crossings of pigmented with depigmented races. It cannot be admitted in such cases that the light eye is inferior to the other. This form is very rare.

ERNEST THOMSON.


(5) Lo Cascio mentions three theories as to the causation of the red colour of the fundus: (1) That it is due to the blood in the choroidal vessels; (2) that it is due to the visual purple; and (3) that it is mainly due to the pigment epithelium of the retina. He quotes many authors, German and French, on these various views, the majority of whom give greatest importance to the choroidal blood. The author states that those who support the pigment epithelium theory base their views on the researches of Marx (*Die Ursache der roten Farbe, etc.*, Arch. f. Ophthal., Vol. LXXI, p. 141), who pointed out that if the red colour is due to blood in the choroidal and retinal vessels, the light reflected from the fundus should, on spectroscopic examination, show the absorption bands of haemoglobin.

The experiments of Marx were of two kinds. He attached a spectroscope to an ophthalmoscope, and examined the eyes of four young men, and an albino rabbit. In the men he found no absorption bands, but diminished luminosity of the yellow and marked shortening of the violet end of the spectrum. In the albino rabbit he found the absorption bands of oxyhaemoglobin, and he concluded that in man there is something in front of the choroid which prevents it having any influence on the colour of the fundus, and that this must be the pigment epithelium of the retina, which is lacking in the albino rabbit.

Marx's other experiment was to wash out the vessels of the eyes of two still-born children with salt solution, and examine the fundi
ophthalmoscopically. He found the fundi as red as before the washing. Lo Cascio has repeated Marx's experiments. In albino rabbits he found in the region between the D and E lines the two absorption bands characteristic of oxyhaemoglobin. In pigmented animals, and using intense illumination, he usually found no band of absolute absorption but a zone of diminished luminosity between 580 \( \mu \)m and 566 \( \mu \)m which corresponds with the left (longer wavelength) band of haemoglobin. He was not able to find this in black rabbits. Examinations in man gave similar results.

The other experiments consisted in washing out the vessels of the head in recently killed animals. Ophthalmoscopic examination showed complete, or very nearly complete, loss of the red colour of the fundus. He suggests that Marx in his experiments allowed clotting to occur before he attempted to wash out the vessels.

Lo Cascio concludes that the red colour of the fundus is mainly due to absorption of light by the blood in the choroidal and retinal vessels, but that in heavily pigmented eyes the light from the choroid is mixed with light reflected from the retinal epithelium.

ARTHUR GRIFFITH.

BOOK NOTICE


A book that has reached its ninth edition needs no words of ours to recommend it. First published in 1907, it has gone on from strength to strength; the last edition came out in 1921. In the present issue all articles have been carefully revised and a few new subjects have been included. The chief alterations occur in the sections on asthma, diabetes, syphilis and tropical diseases, while recent advances in therapeutics find due mention.

The fact that the sections on ophthalmic disorders are by Sir William Lister is a guarantee of their completeness and accuracy. The supplementary index runs to nearly thirty pages, the matter being arranged in three columns to the page. The publishers are to be congratulated on the get-up of the work.