are engaged in general practice should not do their own refractions. It is largely a matter of time, practice and decent visual acuity on the part of the examiner. We have known of several instances where men, on going into general practice, began to do their own refraction work; but few keep it up. The majority find that they have not the time for it, nor do they obtain sufficient practice to ensure their being certain of their results. A few get sufficient practice and some of these eventually give up their general work and become ophthalmic surgeons. Then comes the rub. Their patients naturally suppose that one who calls himself an ophthalmic surgeon in the Telephone Book or Court Guide is competent in all branches of his work, and is fit to perform operations. Few of us are born operators, some of us become from constant practice tolerably sound operators; others never pass the duffer stage. To become expert the operator must start young, and we do not consider that ten years or more spent in general practice is the best form of introduction for such delicate work.

All will admit the advantage of a sound knowledge of general medicine for the ophthalmic surgeon. Some of us seem unable to see an inch beyond our spheres and cylinders, and it is pathetic to see surgeons ordering an optical correction which borders on plane glass to anaemic young women who only need a little fresh air and regulation of the action of their bowels to cure their headaches. In our opinion a short course in general practice forms an excellent introduction to the study of ophthalmology, but no amount of general knowledge will dispense with the absolute necessity for those who aspire to become ophthalmic surgeons of going through the ophthalmic mill and being properly trained in diseases of the eye.

ABSTRACTS

I.—SLIT-LAMP MICROSCOPY


(1) The following is Fincham’s description of this new instrument. Hitherto, the illuminating system and the observing microscope have been free to move independently; this necessitated the re-adjustment of both direction and focus when the inspection was moved from one part of the eye to another. In the present instrument, both the illuminating system and the microscope are
mounted upon an arc which has its centre at the focus of the illuminating beam (see figure). Thus the only adjustment that is required with this instrument is the focusing of the projected image upon the part of the eye to be examined, when the image of the latter will automatically be brought into the centre of the field of the microscope. This adjustment is made by racking forward the arc carrying the two components of the instrument—exact focus being secured when the image appears centrally in the microscope field. The decentring effect produced on the microscope image when the instrument is out of focus is shown in the figure. The cornea of the eye, as shown with a broken line, is placed beyond the focus of the illuminating beam and is consequently out of centre with the microscope. In order to examine the section under different angles, it is only necessary to swing the microscope along the arc, the centring and focusing remaining unchanged. This movement is necessary as, although where possible it is often desirable to examine the section perpendicularly to the illuminating beam, a smaller angle of observation must be employed when observing the deeper structures, owing to the oblique view being cut off by the iris.

Although, for the purpose of studying the sections of the optical media, the combined centring of the microscope and illuminating system is the ideal arrangement, it is found in practice that many
SLIT-LAMP MICROSCOPY

pathological states of the eye are seen to greater advantage by indirect illumination.

The illuminant in this model is a 12 volt, 24 watt, projection-type lamp having a small straight filament which is particularly suitable for illuminating the slit aperture used. Between this and the slit a condensing system of short focal length, consisting of a deep hemispherical positive followed by a strong negative lens, is placed so as to produce a practically parallel beam just large enough to cover the length of the slit. This device was introduced in order that a maximum amount of the light passing the slit should enter the projection lens, which is of comparatively small aperture.

The projected image is produced by a 2-inch microscope objective placed at a distance of 160 mm. from the slit. This is found to give a well-defined image free from aberration effects. In the plate carrying the slit is also a small circular aperture which may be substituted for the slit when it is desired to examine surfaces, either of the optical media or of the iris, conjunctiva, etc. By suitable adjustment of the directions of illumination and observation, the microscope for ordinary use gives a magnification of about 20 diameters, and although this, of course, may be increased it is not generally useful to employ more than double this magnification. To allow of the adjustments for indirect illumination, the illuminating system has been mounted upon a plate which is capable of rotation in a horizontal direction about a bearing A by means of a screw B. In order that the original position of correct centring relative to the microscope may be returned to without difficulty, the head of the driving screw is marked with an index line to read against a zero mark on the pointer C. In addition to this, the projection lens has been mounted in a sliding tube operated by a handle D, to enable the focused image of the slit to be projected, to a point behind that under observation in the microscope, if desired.

In this way the possibility of indirect illumination has been gained without sacrificing the principle of the combined adjustment of illuminating system and microscope, and especially that of making measurements of intraocular distances, which is of great advantage.

An important use of the corneal microscope is the determination of the apparent depth of the anterior chamber of the eye. This is made with the existing forms of corneal microscopes by determining the adjustment necessary in order to focus successively the cornea and the anterior surface of the crystalline lens. This method is, however, open to error as it depends upon the observer’s estimation of exact focus and also upon the control of his own accommodation. These difficulties are avoided in making the measurement with the new instrument. Owing to the fact that the microscope is directed constantly to the focus of the illuminating beam, the observed surfaces will appear central in the microscope field only when the
light is accurately focused upon it. It is therefore only necessary to measure the amount of movement required to bring successively the posterior surface of the cornea and the anterior surface of the lens into coincidence with a central cross-wire in the field of the microscope, to obtain the apparent distance between these two surfaces. To enable these readings to be taken, a small scale and vernier have been fitted to the focusing slide of the instrument.

We have seen this instrument, and besides the novel features which have been mentioned in the description by the author it is capable of use in the same ways as the usual model of the slit-lamp. It has, of course, only one tube in the microscope, so that binocular examination is not possible and also the microscope is not erecting. This makes the instrument to those who are used to a binocular instrument, which is also erecting, a little difficult in use. Other points are that illumination is only possible from the left hand side, and also that the angle between lamp and microscope cannot be reduced lower than 25 degrees. This, however, is not much more than the smallest angle possible with the slit-lamp in common use. The author states that he can easily alter the model so as to reduce this angle to 20 degrees.

The instrument is very compact and can be used upon an ordinary perimeter table, although a head-rest is necessary, and we saw at the Northampton Polytechnic (where Mr. Fincham has carried out his work) a very inexpensive model in some ways superior to the elaborate models now in use.

Mr. Fincham is to be congratulated upon his work, and the instrument as it stands is very useful. If he can make other modifications such as an improvement in the direction of illumination, it will be still more useful. The addition of a binocular microscope will, of course, greatly enhance its value.

It should be remarked that in its present form it fulfils all the requirements of clinical use, and it can be produced for about a quarter of the price of the instruments at present on the market.

CHARLES GOULDEN.

(2) Koby, F. (Bâsle).—A study of shadows in microscopy of the living eye. (Les ombres portées en microscopie oculaire sur le vivant.) Arch. d'Ophtal., May, 1924.

(2) In this article, Koby points out how important it is to have clearly grasped the optical principles involved before an accurate interpretation can be applied to many of the phenomena seen with the corneal microscope and slit-lamp. The paper deals with the shadows carried back into the media behind an opaque object.

Opacity is the ratio between the intensity of illumination in the bundle of light striking an object, and that in the bundle which has
SLIT-LAMP MICROSCOPY

passed through it. So for a body of absolute transparency the opacity is unity.

The optical density of an object, which is a more valuable observation, is found by taking the logarithm of the opacity. Thus, if the incident and the transmitted bundle of light have the same value, the optical density is unity. And, if the transmitted bundle of light has a value of 1/10th of that of the illuminating bundle, the optical density would be unity.

The incident bundle of light may lose some of its intensity in three ways:

1) By absorption—well seen in pigment of the anterior surface of the lens.

2) By diffusion, especially where, as in a corneal opacity, the body is composed of minute points, each scattering the rays of light in every direction.

3) By reflection from the surface, as in an epithelial bulla of the cornea or subcapsular vacuole in the lens.

The amount of this reflection depends on:

(a) The angle of incidence of the incident rays.

(b) The degree of polish of the surface.

(c) The difference in refractive index of the body under consideration, and the medium in which it lies.

As a rule several of the above conditions are taking place at the same time.

These shadows are most easily recognized when projected through a homogeneous medium on to a surface separating two media of differing refractive index, i.e., through a relatively normal cornea on to its posterior surface. Where the medium is not homogeneous, as in marked general vascularization of the cornea, or in diffuse changes in the lens, the shadow is broken up and may not be recognizable.

Superficial new vessels in the cornea, small circumscribed opacities and epithelial bullae all show the clear cut shadow, and the contour of the object may be projected on to the posterior surface of the cornea, as on a screen, in which situation it has occasionally been erroneously localized.

Bullae on the cornea, and subcapsular vacuoles in the lens show reflexes from their anterior convex and posterior concave surface, as well as shadows carried back into the medium behind them.

The vitreous is not sufficiently homogeneous or optically dense to show the phenomena satisfactorily.

O. GAYER MORGAN.
II.—SYMPATHETIC NERVE AND TRIGEMINAL PARALYSIS


(1) Adler, Landis and Jackson set themselves to solve the following two questions:

(a) Is there a tonic influence of the sympathetic on the ocular blood vessels, whereby these blood vessels are normally kept in a semi-constricted condition?

(b) Is this tonic influence effective in preventing changes in the blood pressure from exerting their full effects on the eye where they might cause deleterious changes in intraocular pressure?

Previous investigations have been contradictory. Cats were used and anaesthetized with ether and then given urethane by a stomach tube. The intraocular pressure was measured by a fine Marey tambour connected to a hollow needle thrust obliquely through the cornea, the blood pressure by a mercury manometer connected with the opposite carotid or one of the subclavian arteries. The blood pressure was controlled by tightening or loosening a ligature placed round the aorta above the superior mesenteric artery. Various precautions were taken, and the following findings were recorded:

(1) Blood pressure and intraocular pressure came into equilibrium, in a minute after any change in the former.

(2) The average rise in intraocular pressure for a rise of 50 mm. Hg. in the blood pressure was 6.97 mm. Hg., while the same experiment performed after section of the sympathetic resulted in an additional rise of 1.7 mm. Hg. in the intraocular pressure. At higher blood pressures this effect was more marked.

(3) The height of the intraocular blood pressure at normal blood pressures is not affected by section of the sympathetic.

Clinical findings to the effect that intraocular pressure falls as a result of cutting the sympathetic are probably explained by the long continued miosis, and by the slight enophthalmos with atrophy of the orbital muscle giving altered readings with a tonometer.

The conclusions are therefore:

(1) The rise in intraocular pressure consequent upon a rise in blood pressure is kept in check by a local vaso-constriction of the ocular blood vessels through the cervical sympathetic.

(2) This action is increasingly protective as the blood pressure rises.

BIBLIOGRAPHY

SYMPATHETIC NERVE AND TRIGEMINAL PARALYSIS

5. Obarrio.—Arch. of Ophthalm., 1900.

F. A. WILLIAMSON-NOBLE.


(2) Raeder first briefly describes the anatomical course of the sympathetic fibres to the face, and illustrates his description by an excellent diagram and drawing. He then gives notes of five cases in which the lesions could be localized to a limited space, the situation of which justifies the designation "paratrigeminal" paralysis of the sympathetic. The first case died from pulmonary tuberculosis while under observation. During life the case presented the following symptoms: vomiting, pains in head and neck which radiated beyond the trigeminal region, and epiphora of the left eye. Objectively there was a paresis of the left fifth nerve and paralysis of the left ocular sympathetic, without vaso-motor and trophic changes, and without evident enophthalmos. There was also diplopia, but it was not possible to identify the muscle at fault; it appeared as if there was a variable paresis of several muscles. The post-mortem examination revealed a tumour between the hypophysis and the Gasserian ganglion extending forwards to the superior orbital fissure, and backwards to the posterior limit of the middle fossa of the skull. It was of an indefinite endotheliomatous type. A diagram illustrates its position in relation to the neighbouring structures. The sympathetic fibres, the myelin sheaths of which were either absent or very thin, lay embedded in the tumour, and were infiltrated by its cells to such an extent that the fibres remaining could scarcely be distinguished. The clinical syndrome thus produced does not correspond to that ordinarily found in lesions of the cervical sympathetic, only the fibres destined for the eye being damaged. This is explained by the damage only taking place after the fibres to the rest of the face had been given off from the nerve. Of the other four cases, two were of traumatic origin, probably a fracture through the medial part of the middle fossa. In the first of these there was, in addition to an incomplete paralysis of the sympathetic, some affection of the trigeminal nerve, but the third, fourth and sixth nerves were intact. In the second case, in addition to a lesion of the second and fifth nerves, there was...
a paralysis of the sympathetic which involved only the fibres to the
dilatator. This would indicate that the lesion lay further forward,
that is in front of the anastomosis between the carotid plexus and
the oculo-motor nerve. Of the remaining two cases, in one, a
paresis of the fourth and sixth nerves was associated with epiphora,
nearalgic pains, and reduced tactile sensibility in the area of the first
sensory branch of the trigeminal, as well as with ptosis and miosis.
In the remaining case there was evidence of sympathetic paresis
accompanied by trigeminal neuralgia. This case is said to resemble
the affection of the sympathetic in herpes ophthalmicus described by
Bing (Gehirn u. Auge, 1914). The site of the lesion could be
verified only in the first case, but the author concludes that he is
justified in assuming, from the similarity of the symptoms, that the
lesion in the other cases must have been in the same situation. He
says that he has found a considerable number of cases of trigeminal
neuralgia accompanied by homolateral miosis recorded in the
literature of the subject and considers that the majority of these
were due to "paratrigeminal" lesions.

E.E.H.

(3) Hartmann, E.—Section of the trigeminal nerve in man.
(Les conséquences physiologiques et pathologiques de la
CLXI, p. 242, 1924.

(3) Hartmann reviews the subject and gives some new evidence
that division of the fifth cranial nerve proximal to the Gasserian
ganglion results in:

(1) Loss of superficial sensibility.

(a) Epicritic, including light touch, slight modifications of
temperature between 22 and 44 degrees centigrade, perception
of two compass points;

(b) Protopathic, or sensation of pain and coarse changes of
temperature; while deep sensibility, pressure sensibility, bone
sensation and muscle sense pass by the seventh cranial nerve.

Hartmann admits the possibility of the passage of sensory
impulses by sympathetic fibres on blood-vessels in some cases.

(2) Vasodilatation of the area of the divided nerve and of the
retina, a few days after the section. Hartmann explains this as
due to irritation of the peripheral end of the divided nerve in scar
tissue. He points out that such vasodilatation, after division of a
sensory nerve, was shown by Bayliss in the case of division of a
lumbar nerve and that it was explained as being due to bifurcation
of the sensory nerve into a sensory branch and a vaso-dilator
branch passing to the skin vessels of the corresponding area.

(3) Pupil changes. No inequality of pupil results from section,
but during at least one hour after section of the nerve, there is an
increased reaction to mydriatics or to miotics, due probably to a loss of control. After seven days, there is miosis. This miosis is probably due to irritation of the distal end of the nerve by the scar tissue, so that an iris vaso-dilatation occurs in the same manner as explained above.

Hartmann summarizes his results as follow:

The fifth nerve contains no fibres
(1) of deep sensation,
(2) concerned in vaso-motor action,
(3) concerned with pupillary action,
(4) that have any effect on ocular tension.

Immediately after section of the fifth nerve, there is a state of hyper-excitability which is manifested by:

(1) increased vaso-motor reaction of the skin to stimulation,
(2) increased reaction of the pupils to drugs,
(3) increased sweating of the skin after pilocarpin injection.

HUMPHREY NEAME.


(4) According to Hartmann this arises (1) in cases with lagophthalmos (a) facial palsy preceding or following the operation; (b) from cicatricial contraction of the lids.

(2) In cases of slight trauma, as by wind-blown dust driven into the eye for a period—an eye in which corneal sensibility is absent.

(3) In cases of purely trophic origin, without any suggestion of lagophthalmos or trauma. Within a period of from two to ten days up to three months or more after the operation of nerve section exposure of the cornea for a few seconds may result in the formation of a finely granular appearance, due to partial desquamation of the epithelium.

Keratitis of trophic origin in section of the root is always relatively mild and curable by blepharorrhaphy if treated early.

Occurrence.—In 38 cases of nerve section, followed for at least three months after the operation, 20 (i.e. 53 per cent.) had keratitis.

Severity:—When compared with cases treated by excision of the Gasserian ganglion, those treated by section show a much milder form of keratitis.

Petrosal nerves.—In cases with damaged petrosal nerves, there is a higher percentage of keratitis incidence, but yet the integrity of these nerves does not in all cases prevent the development of keratitis.
Corneal sensibility.—Those with partial section of the fifth nerve with retention of corneal sensibility had a lower incidence of keratitis, but still the presence of this sensibility does not always prevent the development of keratitis.

Injury to the Gasserian ganglion is sufficient alone to account for keratitis, but, on the other hand, cases have occurred with undoubted damage to the ganglion without the appearance of keratitis.

Hartmann doubts the universal importance of the bearing of lacrymal secretion, and of corneal sensibility, and suggests that hyperfomy of the parasympathetic is at the root of the matter in most cases, as being accompanied, according to several workers, with a reduction in the resistance of the organism to poisons and so, possibly, to bacterial action.

He summarizes the factors which concern the development of keratitis after operation:

A. Operative technique.
   (a) Division of the fibres in skin incision of the seventh nerve which supply the orbicularis muscle.
   (b) Tearing of the nerve root instead of section.
   (c) Injury to great superficial petrosal nerve.
   (d) Injury to Gasserian ganglion.

B. Sepsis of conjunctival sac, and need before operation:
   (a) To investigate the permeability of the lacrymal passages and to treat accordingly.
   (b) To treat all conjunctivitis, even slight or chronic.

C. Palpebral.
   (a) The necessity of blepharorrhaphy in case of facial paralysis.
   (b) The need of autoplasty in case of cicatricial ectropion.

D. Subsequent trauma to the cornea.

The treatment of an established keratitis is the performance of an immediate blepharorrhaphy after careful cleaning. The lids should only be opened gradually during the course of several months.

Humphrey Neame.

III.—MISCELLANEOUS

(1) Blatt, Nicholas (Roumania).—Gumma of the ciliary body as a late syphilitic product. (Gumma des Ziliarkörpers als spätletisches Produkt.) Klin. Monatsbl. f. Augenheilk., Vol. LXVII, 1921.

(1) Blatt's patient, aged 40 years, was infected 11 years previously. Inunction during one month. Four months later maculopapulous manifestations, otherwise healthy up to present. During
MISCELLANEOUS

last four weeks the patient has experienced pain in the left eye and has observed that his sight with this eye is diminished in keenness. **Right eye:** Normal, V.R.=5/5. **Left eye:** Redness in the ciliary region, dulled flattened cornea, Descemet precipitates, adherent iris. In the upper corner of the anterior chamber a yellowish, markedly vascular swelling, apparently about 3 mm. in size, which pushes the iris before it. The sclera in this region protrudes in the form of a bean, has a dark blue colour and is extremely sensitive to pressure. High up behind the iris a greyish-yellow reflecting mass. By transillumination only a reddish-grey reflex. V.L. fingers at 0.5 m.—Wasserman +++ Painless enlarged glands. Treatment from 12.VII. to 26.VIII. Daily 3 gr. Ung. hydrarg ciner., 3.3 gr. neosalvarsan. After a four weeks' treatment there remains in the place of the swelling only a reddish-grey spot on the iris. At the time of discharge only slight punctiform cloudiness of the vitreous body. V.L.=5/15. Blatt refers to the published work of v. Hippel, Uhthoff, Busse, Swetsky, and Tooke on this subject, and lays particular stress on the late development of the gumma in his case (11 years after infection). At the same time he draws attention to Busse's statement that different apparently gummatous swellings should in reality be looked upon as papulous formations. In most of the known cases the gummatous formation developed between three months and one year after the primary infection. The therapeutic results were deplorable in the pre-salvarsan era, and the swelling disappeared only in quite exceptional instances in spite of antisyphilitic treatment. Phthisis bulbi was frequently noticed.

V. ST. JOHN.


(2) Witham reports a pathological rarity in the form of teratoma of the lacrimal gland. In 1918 he removed the tumour under local anaesthesia from a person aged 21 years. It had taken origin in the region of the accessory lacrimal gland, and presented into the opening of the palpebral fissure for about 7 mm., interfering with the movements of the eyeball. The tumour was solid and measured 1.5 × 0.8 × 0.8 cms.; when the fibrous capsule was split with a knife there was exposed a small, well formed, sharp tooth, possessing a perfect coating of enamel. Microscopic section showed a loose connective tissue with muscle cells, islands of fat cells, and an area of normal bone, surrounded by a layer of flat cells. Five years after removal of the tumour there had been no recurrence.

J. N. TENNENT.

(3) In his paper Fink confines himself to disturbances of vision and to changes in the fundus oculi which occur in pregnancy, in cases of oedema of pregnancy, and in nephritis of pregnancy. His report and results are made from 108 cases, composed of eclamptics, pre-eclamptics, and pregnancy nephritics. He reports that 35 per cent. of these suffered from disturbances of vision. Fifty women were examined with the ophthalmoscope, and in fifteen patients there were changes in the fundus. In a later examination of forty-four cases eleven were still showing fundal changes.

Without going into special cases his conclusions are as follows:
1. An ophthalmoscopic examination should be made in all cases of disturbances of vision in pregnancy.
2. Loss of vision in pregnant women who suffer from nephritis, pre-eclampsia or eclampsia, is not serious in itself, and does not call for any interference.
3. In sudden loss of vision, partial or total in degree, the procuring of abortion is only necessary if there be a uraemia.
4. Loss of vision which sets in gradually can have a pathological foundation. Might be a chronic nephritis, but this occurs only occasionally.
5. If a detachment of the retina be found on examination, the treatment depends upon whether there be a severe chronic nephritis present or not.

In the first case the pregnancy should be terminated. In the second, treatment by rest in bed, etc., should be carried out.

6. The statement that retinitis of pregnancy is only found in cases where there is a chronic nephritis has been refuted. It is also found in the group of pregnancy toxemias. Only in exceptional cases should one procure abortion early where there is a retinitis of pregnancy.

7. Retinitis of pregnancy shows a favourable prognosis as regards life, and a relatively favourable prognosis as regards sight.
8. The opinion of Adam, viz., cases of chronic nephritis which develop a retinitis of pregnancy have a bad prognosis, was not found to be correct in three cases in which this condition was met.
9. If the retinitis is diagnosed as a specific retinitis albuminurica, then abortion should be procured, as prognosis is bad both as regards sight and life.
10. The treatment recommended by Schöttz, that all cases of chronic nephritis in which there are fundal changes, should have the pregnancy terminated and the woman sterilized, is not justified, and should only be performed in severe cases.

S. SPENCE MEIGHAN.