
In the Richard Middlemore Post-Graduate Lecture, 1928, Eales surveys some of the conditions giving rise to blindness and coming within the description "preventible" as he defined it for the purposes of the lecture. In turn ophthalmia neonatorum, phlyctenular conjunctivitis, interstitial keratitis, perforating injuries, sympathetic ophthalmitis and serpiginous ulcer of the cornea were considered in regard to their incidence, treatment and effects on visual function. For the full facts and figures the original paper must be consulted.

R. C. Davenport.

BOOK NOTICES


Volume I. Technique and Methods. The Cornea and Anterior Chamber

The slit-lamp was invented in 1912 by the late Professor Allvar Gullstrand and was used by him for the examination of the anterior portion of the eye. The first observations were made with the aid of an ordinary Zeiss field-glass, and with this inadequate equipment Gullstrand discovered that the lens was far from homogeneous. The late Professor Henker combined the slit-lamp with the Czapski corneal microscope, a great advance, which at once made the instrument of real value to the clinician. Koeppe attacked the clinical side of the question, and brought out a book dealing with the minute anatomy and pathology of the cornea. He also applied the contact-glass to the cornea and added a reflector, which, used with a special monocular microscope, enabled him to examine the whole of the vitreous and the minute details of the retina. So far the slit-lamp had been used only as a source of illumination better than that hitherto employed. The examination was the microscopy of the living eye, nothing more. Vogt now attacked the problem, and began a research which has given us a method of examination which has revolutionised our previous methods of oblique illumination. His painstaking observations have presented ophthalmology with facts regarding the anatomy and pathology of the eye, which were almost undreamt of before the advent of the slit-lamp. His work marks an epoch; he has created a new science, and those who have the privilege of reading the volume under review will inevitably come to the conclusion that there is little more to be done except to add details.

Henker modified the method of illumination, and Vogt then added the adjustable slit to the lamp. This alteration was of fundamental importance. We could now view the anterior half of the eye in optical section, and exact localisation was achieved. Mere surface microscopy was replaced by examination in three dimensions.

In 1921 Vogt published his first Atlas, which was at once translated into English, French, and other languages. The first edition, including the translations, was rapidly sold, and could not be obtained. Ophthalmologists all over the world have been waiting with eager anticipation for a new edition, and the work under review will not disappoint them.
The first volume which has just appeared has 300 pages and over 600 illustrations, nearly all coloured. These are on plates interleaved in the text. Our only criticism is that there are no legends. It would have been more convenient had each plate been faced with a page explaining the drawings. As it is, one has to search the text to find the description of a drawing.

The work is excellently printed on good paper, and the illustrations are real works of art. They are painted in the main by Bregenzer, the official artist at the Eye Clinic at Zürich. The price of the book, roughly £9, seems high, but it is difficult to see how such a gallery of colour could be produced for less.

The second volume which is promised shortly will be devoted entirely to the lens, and the third volume to the remainder of the eye. The complete work will cost about £27, and when it is realised that the book may be said to be the final word upon the subject, and that it is extremely improbable that anything like it will appear again, it is a good investment. The subject is so important that no competent ophthalmologist can afford to be without it as a work of reference.

The German in which the book is written is easy and direct, and can be understood by anyone with a reasonable knowledge of the language. This is by no means true of all German medical works.

In the preface the author regrets that, although most ophthalmologists own slit-lamps, the majority have not mastered the full technique, and are not able to take full advantage of the instrument. Many use the apparatus for mere surface microscopy and have not realised the possibilities of the narrow beam, of the optical section, and of exact localisation. He hopes that this text book will remedy this failure, and that the slit-lamp will become as essential to them as the ophthalmoscope.

The chief trouble the beginner experiences is simultaneously to maintain the focus of the microscope and the beam of light upon the object under observation. He must practise till he can do this automatically and without thought. We think that Vogt exaggerates this difficulty; we have found that even unqualified medical students learn the technique rapidly. They find it much easier than the use of the old-fashioned reflecting ophthalmoscope. Older men take far longer, but with a little application all difficulties disappear. It is essential to begin with a low magnification. Vogt points out that long ago attempts were made to side-track this difficulty by constructing the instrument so that the beam and the microscope were fixed to a combined focus. He says that such an instrument is "unthinkable," *gans einfach undenkbar*; it makes it impossible to utilise the various methods of illumination, and violates the fundamental principles of slit-lamp microscopy. Those who have mastered the correct technique realise that such instruments are useless.

The first part of the volume is given to a full description of the Zeiss slit-lamp, including the arc-lamp attachment. Vogt recommends the mechanical stage mounting rather than the glass-top
table. We are of opinion that the heavier mounting is the best for hospital use, where the glass top is liable to be broken, and the microscope knocked over, but we prefer the glass top for consulting room use, and incidentally it is cheaper. The methods of adjustment are fully described, and we are warned to keep the slit free from fluff and hairs which destroy the perfection of the beam and make accurate work impossible. The slit is delicate and an ordinary sable paint brush should be used for the purpose. It is not necessary that the room should be quite dark for ordinary examinations. The finer points are seen only when the observer's eye is dark adapted. Both patient and surgeon should sit on stools adjustable for height. Exact surface measurements can be made with the micrometer eyepiece, and if a goniometer is used to measure the angle between the axes of the lamp and microscope, anteroposterior measurement can be made by the usual trigonometrical methods. The micrometer drum on the microscope enables us to estimate the depth of the anterior chamber, the thickness of the lens, and so forth. Then follows the important chapter on the varied methods of illumination. The chief are direct focal illumination, examination by transmitted light, and the use of the area of specular light. Employment of mirror light allowed Vogt to observe the endothelial cells of the cornea, and the epithelial cells of the anterior capsule. Exact localisation by the use of the narrow beam is carefully described and merits the closest study. Measurements with the micrometer eyepiece are very valuable to the clinician in so far as they relate to surface estimation. It is useful to have a record of the extent of a corneal infiltration, or of a lens opacity, but when triangles have to be solved the work becomes academical and unsuited to the everyday work of the clinician. Here the method of estimation with the narrow beam is of vital importance, and is in constant use. With the narrow beam the expert can by simple inspection localise the exact position of say a foreign body in the cornea, or of an opacity in the lens. Such estimations are often necessary and are made in a few minutes, with an exactitude quite sufficient for clinical use. Study of the endothelial cells may seem to have little practical value, but when we realise that dimming of the outlines of these cells may be one of the first signs of inflammation, then such observations are seen to have a real practical significance.

In the original atlas Vogt described a bedewing, oedema, of both the anterior and posterior surfaces of the cornea. He has now come to the conclusion, and we feel that he is correct, that there is no such thing as posterior oedema. The appearance suggesting a posterior bedewing is due to deposit of lymphocytes on the endothelium. Such are seen in the normal eye, forming Lüssi's line, which is common in children. In early inflammation the whole corneal
surface may be covered, and the impression of an oedema is conveyed to the observer.

The Special Section of the book begins with the normal cornea and the changes that occur with advancing age. A dark adapted eye, with careful focusing, can differentiate the epithelium from Bowman’s membrane, and naturally any separation of the epithelium is at once obvious. The endothelium with the Hassal-Henle warts is shown in Illustration 47, and in 52 the normal appearance of the corneal nerves is demonstrated. These lose their sheaths as they enter the cornea, but occasionally they are preserved for some distance into the clear cornea, a condition comparable with opaque nerve fibres in the retina. The nerves are to a large extent confined to the anterior two thirds of the cornea. They generally divide dichotomously, but modifications are seen, nodules on the nerve fibres and webs at the points of division. The visible circulation of the blood in the limbal vessels is seen only when the column is interrupted, and when transmitted light is used. Plate 12 is devoted to arcus senilis and its variations. Even in youth an arcus juvenilis is not infrequently seen with the narrow beam.

A peripheral senile furrow is seen in Figure 101, occupying about one third of the cornea. This is apparently faced by a corresponding furrow on the posterior surface of the cornea, but this is merely an illusion caused by the irregular refraction of the surface furrow.

The superficial lines which develop in the senile cornea are fully described and illustrated. The so-called Stähli’s line was first described by Hudson using ordinary oblique illumination and the common loupe. It takes a variety of forms as seen on Plates 15 and 16. A deposit of pigment on the posterior face of the cornea is very common in advancing age, many varieties have been described as occurring deep in the corneal parenchyma. Careful use of the narrow beam localises them on the posterior surface of the cornea. Vogt regards Krukenberg’s spindle as a special modification of the ordinary deposit on the endothelium. It may take a variety of forms, and has been described in the horizontal position and inclined. The beaten-silver cornea, cornea guttata is held to be associated with Fuchs’ epithelial dystrophia. Vogt has had the opportunity of making a microscopic examination of an eye with this affection, and microphotographs are given. The central axial portions of the cornea show prominences of Descemet’s membrane reminiscent of the Müller-Henle warts, but they are found axially, never in the periphery, whereas the warts are not so localised.

Cornea farinata, in which the posterior surface seems to be covered with flour-like dust is as far as we know a new discovery. Its nature is made abundantly clear by a fine drawing. Another new condition is the white limbus girdle. This degenerative process is not easy to see and is visible only by retro-illumination.

Groenouw’s disease, nodular keratitis, is illustrated in its various forms on Plates 29 and 30. This is a hereditary degeneration situated in the superficial and medial layers of the parenchyma.

Parenchymatous crystalline degeneration of the cornea is found in middle age and in the senile period. It is not associated with any inflammation or vascularisation, is slowly progressive, and characterised by the formation of crystalline needles which are most numerous in the advancing peripheral border.

The appearances seen in keratoconus are now well known. Fleischer’s ring and the well-marked striae are well shown in numerous drawings. The endothelial cells are especially prominent
and are seen over a wide area. Corneal nerves are large and greatly increased in number.

In **pseudo-sclerosis** (Kinnier Wilson's disease) the liver shows a characteristic sclerosis and in the region of the corpus striatum there is neuroglial proliferation and degeneration.

The first case was described by Westphal in 1872 and called by him pseudo-sclerosis. In 1912 Kinnier Wilson described a similar, perhaps identical, syndrome, to which he gave the name of progressive pellagroid degeneration. In 1902 Kayser, and in 1903 Fleischer, both of Tübingen, described a pigmented corneal ring in cases of pseudosclerosis. The latter also found on autopsy peculiar pigmentation of various organs. Rumpel and Söldner found that the pigmentation in the kidneys was due to silver. Söldner discovered traces of antimony and a large amount of copper in the liver. This discovery was not confirmed by later investigators, but when the celebrated case, Elise Utzinger, who had been kept in the medical wards under Nägelli and others for over forty years, died, Vogt had a careful chemical examination made by the most modern methods. In this case and in another similar patient the liver contained an enormous amount of copper, and the kidney considerable silver.

In some cases of pseudosclerosis a genuine copper cataract of the typical sunflower type has been present in both eyes, although no copper had entered the eye or had been used in the treatment. Vogt has seen cases in which pigmented changes in the region of Descemet's membrane have been present in eyes that have been treated with colloidal silver preparations and he has succeeded in inducing similar pigmentation by instillations of argyrol. His drawings are similar to a case published by the reviewer in this Journal, Vol. XII, page 401. There can be no doubt that this hitherto unexplained case was due to argyrol which had evidently been employed at some time or other in the treatment. The course of this case was exactly that described in Vogt's experimental cases and the bright cyanine pigmentation was the same. Finally Vogt has treated sections of the cornea showing the Fleischer ring with potassium cyanide and has dissolved out the coloration. He thinks, and those who read his remarks on the subject will agree with him, that the Kayser-Fleischer ring is caused by diffraction phenomena due to the presence of very fine particles of metallic silver in the cornea. Investigations at Vienna by Gerda Laski, show that such particles can and do produce colour effects. The sunflower cataract is certainly due to the presence of copper in the blood, for this form of cataract is absolutely typical and is caused by nothing but copper in the eye. Vogt suggests that Kinnier Wilson's disease is due to a failure of the liver to eliminate metal absorbed in food, or even that it collects and stores silver and copper. This causes a toxaemia which is responsible for pseudosclerosis.

**Keratitis epithelialis.** It is impossible to classify the many conditions seen with the slit-lamp which fall under this heading. Several varieties are pictured in Plates 41 and 42. It is not even known whether they are degenerative processes or inflammatory; they can be described and named only from their anatomical appearance.

**Interstitial keratitis.** The drawings of the many varieties of keratitis profunda are worthy of careful study. The narrow beam shows the enormous thickening that is present in the acute stages and later the thinning and ectasias that may follow. Typical of the congenital syphilitic type is the sclerosis of the posterior layers of the cornea. This may reflect light even more vividly than the corneal surface, and taken with the presence of deep vascularisation leaves little doubt as to the nature of the original disease.

**The anterior chamber.** The slit-lamp is of great value in determining the depth of the chamber. Often by ordinary examination there would appear to be no chamber left, say after an operation for glaucoma, but the slit-lamp shows that at the periphery and in the
pupil area there is still a collection of aqueous. Examination of the aqueous with the slit-lamp may detect the first signs of inflammation. The normal fluid is almost optically inactive, but when it becomes loaded with albumin the beam becomes visible as it traverses the anterior chamber, just as the headlights of a car are obvious to the driver in a fog. The density of a beam may be taken as a measure of the albumin content of the aqueous. Again, particles in the aqueous show a streaming motion in the convection current in the aqueous, rising at the back and falling in front. As soon as the albumin content reaches a certain concentration the particles come to rest. The re-establishment of the convection current is the first sign that the inflammation is abating. After operations and accidents the vitreous may enter the anterior chamber. The extent and nature of the prolapse can be studied with the slit-lamp.

The scope of the work is so enormous that we have been able to touch upon but a few of the subjects, but we hope that we have said enough to convince our readers that the book is one that no ophthalmologist can afford to be without. Even for those who cannot read German, the illustrations will be of the greatest value.

T. Harrison Butler.


This volume of Transactions, containing 41 communications, is, as usual, supplemented by summaries of the papers in English, French and German. The summaries are very brief and do not enable the reader to gain more than a scanty idea of the contents or value of the papers. The number and variety of the communications bear witness to the zeal and activity of the members of the Society.

Glaucoma in some of its aspects is the text of 19 of the 41 papers. Z-Zichova induced acute inflammatory glaucoma in a rabbit by injecting trypanflavin into the anterior chamber. Examination of the eye showed oedema of the cornea, iris and ciliary body, contracted arterioles in the iris due to swelling of the endothelium, with dilated and blocked veins.

Slavik reported 13 cases of hydrophthalmos in which varied operative measures were almost invariably unsuccessful. Franta examined the blood serum for alteration in the quantity of salts of calcium and potassium, in 16 cases of primary glaucoma and 16 controls. No abnormality was found in the calcium content, but in all cases a slight diminution of potassium content was detected. Slavik's results from cyclo-dialysis are given: 127 operations on 97
patients. In 69 cases of simple glaucoma good results were obtained in 60.9 per cent; in 22 cases of chronic inflammatory glaucoma the result was good in 31.8 per cent. The remainder were examples of secondary glaucoma. Gala, in 438 cases of primary glaucoma found myopic refraction in 1.6 per cent; all but one occurred in males. One man, aged 44 years, had myopia of 7 - 8D. Knobloch gives his findings as to the aetiology of scleritis, in 65 cases seen during a period of 10 years. In 79.3 per cent. tuberculosis was deemed to be the cause; in 11.1 per cent. the cause could not be determined; other probable causes such as syphilis, staphylococcus infection, uric acidemia, are credited with the remaining cases. In view of the great preponderance of tuberculosis cases, the author counsels treatment on anti-tubercle lines in all cases of obscure causation. Klauber reports the successful treatment of a “typical rodent ulcer” of the cornea by 5 per cent. gold chloride and tannin. The remaining summaries are of papers on Progressive Ophthalmoplegia Externa, Therapy of Pituitary Tumours, Long Retention of Intra-ocular Foreign Bodies, Orbital Abscess, Ethmoidal Mucocele, etc.

CORRESPONDENCE

To the Editors of The British Journal of Ophthalmology.

Gentlemen,—The following notes of a case of high astigmatism, which came for refraction to Moorfields Hospital a few weeks ago, may be of interest. The case was under the care of Mr. Neame to whom I am indebted for permission to publish it.

Mr. C. S., aged 30, commercial traveller, complained of “distant vision not so good as formerly.” According to the old notes of January, 1928, he had vision

R. \( \text{c} - 1^0.0 \text{D.sph. c +1'0 D.cyl. 160^\circ \rightarrow 6/9} \)

L. \( \text{c} - 1'5 \text{D.sph. c +1.0 D.cyl. 20^\circ \leftarrow 6/36} \)

I found vision

R. \( \text{c} - 2'0 \text{D.cyl. 90^\circ \downarrow 6/6 most} \)

L. \( \text{c} + 5.0 \text{D.sph. c -10'0 D.cyl. 97\frac{1}{2}^\circ \downarrow 6/9} \)

It was possible, by naked eye observation of the corneal image of a window, to tell which was the meridian of greater curvature.

Yours truly,

F. C. Wilson.