and brings the bibliography up to date, though with some not
unimportant omissions.

In addition to an admirable description of the commoner types
of sarcoma and carcinoma, their clinical histories and features,
its includes examples of many cases of rarer forms, such as, for
example, primary carcinoma of the ciliary body. Most of the
illustrations of histological details are from drawings which depict
the structures very clearly.

The book can be confidently recommended as a sound guide
to the subject, whilst the discussion of many illustrative cases
which have come under Dr. Morax's own observation should secure
for it a place in every ophthalmological library.

CORRESPONDENCE

THE STRUCTURE OF THE RETINA

To the Editor of The British Journal of Ophthalmology

Sir,—Arising out of the abstract which appeared in your issue
of April, p. 228, on the work of Dr. Fortin on entoptic vision and
his description of a hitherto undescribed layer of the retina lying
between the external fibre layer and the internal nuclear layer,
he has been good enough to send to me two microphotographs of
the macular region of the eye of the monkey with some further
observations on his interpretation of them. The photographs are
of a standard of excellence which may merit their publication:
they were taken from the freshly enucleated eye of a healthy animal,
and are largely free from the post-mortem changes which we are
accustomed to meet in ordinary histological technique.

In each, at the top, the sclerotic, choroid, and pigmentary layer
are lacking. Then appear, from above downwards, the layer of
cones, the external limiting membrane, the external granular layer,
and the external fibre layer with the fibres of Henle.

Dr. Fortin draws attention to the appearance of the foveal cones.
They appear as simple fibres surrounded by a light cuff ("léger
manchon"), and they pierce at definite intervals the external
limiting membrane, which is invariably perfectly regular and
sharply defined. The appearance of this membrane suggests a
function comparable to the bridge of a violin, keeping the fibres
taut, maintaining their individual position, and preventing them
from intermingling. The appearance is maintained uninterruptedly
CORRESPONDENCE

from its attachment on the one hand at the disc to its attachment peripherally at the ciliary body, and Fortin thinks that the movements of accommodation, convergence, etc., by rendering it lax at one moment and taut at another, and thus altering the spacing of the elements supported by it in so doing, account for the phenomena of macropsia and micropsia.

In the external fibre layer the individual fibres are perfectly isolated and regularly orientated, radiating always from the central axis of the eye; at their termination, between this layer and the internal nuclear layer, lies the single line of cell-shaped structures which he has demonstrated entoptoscopically and has photographed histologically by the aid of monochromatic light (vide Abstract). Dr. Fortin does not agree that at the foveal region there is a zone of homogeneous and equally formed elements arranged in mosaic, which represents the area of retinal fixation and the region of maximal visual acuity. Anatomically all the retinal elements are centred round the optical axis of the eye, and physiological observations show that, in his opinion, fixation is attained not by a group of cones, but by a single cone. Moreover, he insists that the limiting angle of visual acuity is smaller than has usually been accepted, and is certainly not of a size which corresponds to the distance between two cones at the fovea, but is about ten times smaller, a finding which he takes as verified by the phenomena of stereoscopic vision and the entoptic vision.

FIG. 1.

Fovea of Monkey.—The sclerotic, choroid, and pigmentary layer are not reproduced. The central cones appear as long filaments. Note the admirable definition of the fine external limiting line like the bridge of an instrument isolating the strings.
of the red blood corpuscles in the perifoveal capillaries. A cone is therefore too large to function as the ultimate element in the visual apparatus. The arrangement of the fibres of Henle, and

![Image](image.png)

**FIG. 2.**

Fovea of Monkey.—The long central cones in no way resemble cones but are simply long filaments. The external limiting membrane is a geometrical line sharply defined.

the measurement of their diameter, which is of the order of the wave-length of visible light, suggests to him that these structures play a hitherto unsuspected part in the perceptive mechanism, and he attributes to them an "undulatory function" in resonance with the waves of light; these then react upon the "new" structures
situated in a regular layer at their termination, to which latter he ascribes the fundamental rôle in the process of visual perception.

The above seems to be an inadequate sketch of Dr. Fortin's argument as I translate it; we shall look forward to hear more of it in the future. Whatever the ultimate value of his observations and of the interpretation he attaches to them may prove to be, they are not without interest both for themselves and for the demonstration they provide that minute anatomy is by no means a completed science. It is interesting to speculate how far from the actual truth are the artificial pictures of fixed and stained cells we pronounce upon with so much assurance in our crude methods of histology, and how far our ideas would be revolutionized, especially in dealing with structures of the delicacy and complexity of the retina, were we to evolve less mutilating methods of technique, and employ invisible light of wave-length so short as to be partially opaque to unstained protoplasm, rendered visible by a process of ultra-violet photography, or made apparent through the medium of fluorescence.

Yours, etc.,

W. S. DUKE-ELDER.

LONDON, W.
July, 1926.

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—I have the honour to make some remarks about the letter of Dr. MacCallan in the July issue of your journal, page 415, who wrote the following about my article:

"The article 'Trachoma in Palestine,' which appears in your May issue refers to the stages of trachoma without stating the origin of this classification."

The classification of the stages of Trachoma in Palestine has its short history. There was no uniform classification of the stages till 1914; only in the spring of the same year was there worked out at the First Trachoma Conference of the Jewish physicians in Palestine a uniform scheme of different stages and, as the basis, Professor Hirschberg's classification of trachoma was accepted.

Mild, Medium, Severe, and Terminated. But afterwards it was decided at the Conference of the eye physicians of the Hadassah Medical Organization, which took place in Jerusalem on November 3, 1921, and at which I was also present, to simplify Professor Hirschberg's classification of trachoma in the form I stated in my article on page 252, where our

Stage I corresponds to Hirschberg's "Mild Trachoma."
Stage II "Medium Trachoma."
Hirschberg's "Severe Trachoma" was divided in such a manner that all complications of the cornea and eyelids were shown in separate columns, and the third stage was recognized by hypertrophic scars of the conjunctiva. Our stage IV corresponds to Hirschberg's "Terminated Trachoma."

Thus Dr. MacCallan can see, that the origin of the classification of the stages of trachoma, pointed out in my article, refers to the Work of Professor Hirschberg, published in 1897, under the heading: "Uber die körnige Augenentzündung in Ost und West Preussen und ihre Bekämpfung."

At the same time I wish to point out that I am in possession of the very interesting Annual Reports of the Ophthalmic Section, signed by the Director of the Ophthalmic Hospitals, Dr. MacCallan, and not a long time ago I was glad to use from those reports the figures of the bacteriological examination of the conjunctiva for my article: "Les maladies des yeux à Caiffa." Annales d'Oculistique, Décembre, 1924.

Yours faithfully,

N. T. Shimkin,
Chief Ophthalmologist of Hadassah Medical Organization, Haifa, Palestine.

Haifa.
July 14, 1926.

NOTES

Death
We regret to hear of the death of Dr. Alexander Duane of New York. We hope to publish an obituary notice at a later date.

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Appointments
The following appointments have been made recently at St. George's Hospital, London:—Consulting Ophthalmic Surgeon, Mr. Harold Grimsdale; Ophthalmic Surgeon, Mr. R. R. James; Assistant Ophthalmic Surgeon, Mr. W. Stewart Duke-Elder.

Mr. W. Clark Souter has been appointed ophthalmic surgeon to the Aberdeen Royal Infirmary.

Mr. G. P. Penman, has been appointed second ophthalmic surgeon to the Royal Northern Hospital, London.