that the internal medicinal treatment, as advocated in this article, is superior in many ways to and more to be relied upon than the usual modes of treatment of this disease—primary glaucoma.

REFERENCES

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(In this paper there is given by request of oculists a detailed account of the mode of administration of this treatment).

THREE UNUSUAL CASES OF FOREIGN BODIES IN AND ABOUT THE EYEBALL*

BY

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To those who attended the meeting of this Society held at Hot Springs in 1920, or to others who may have read its transactions for that year, the identically similar title of this, with my previous paper, will immediately be apparent. The earlier article was presented with the more particular appeal, and possibly with some unusual element of interest, to those who had seen service in the Army Medical Corps. The value of the paper, however, as in so many presented before this Society, consisted, not so much in the article itself, as in the interesting and varied discussion and contributory elements of information which it evoked.

The cases about to be recorded occurred in civil life and are comparable to the former ones in one respect in particular, and that is, that the term "unusual" is even more emphatically applicable. The offerings are definitely alike in that the foreign bodies were retained for a considerable period of time, but absolutely incomparable regarding the nature or character of the accident and the quality of the material responsible for each injury.

I acknowledge, at the outset, that as subject of an ultra-scientific character, supplied or supported with a pathological background, or possessing a bio-chemical problem, as seems to be essential in so many of the articles read at present day meetings, it is valueless. As supplying a short series of varied practical problems which the majority of us have to face, not as laboratory workers, but as practising ophthalmologists, the cases may possibly convey some information and possess some worth.

* Read before the American Ophthalmological Society, July 10, 1934.

Case 1.—F. McL., aged 52 years, Canadian, was referred to me in November, 1933, by the Canadian National Railroad Company. The man stated that eight years previously he had been working in a drain and that after striking a pipe something flew into his right eye. As far as the patient could remember the pipe was cement and the hammer was steel. Sight was lost almost at once. He consulted an oculist of unquestionable repute who, after having the eye X-rayed, appreciated the character or nature of the injury and advised him to leave the eye alone. The man followed his vocation as a mechanic through the years, suffering little or no pain, and reported to the medical staff of his company

FIG. 1.

Absence of impression of large piece of concrete seen in anterior chamber and retained in eye eight years.

owing to the eye having recently exhibited evidences of pain and inflammation.

The railroad authorities supplied me with X-ray plates of the eye and orbit which were negative in all particulars (Fig. 1).

The conjunctiva bulbi showed a moderate degree of injection while the anterior ciliary vessels about the limbus corneae were unquestionably engorged. No evidence of a previous penetrating wound could be made out, the anterior chamber was of normal depth, and the eyeball was not tender on pressure, or soft. The pupil was moderately contracted, the lens, in so far as one could see it, was cataractous, with calcareous degenerative changes about the capsule and light perception was absent. In the lower filtration angle there appeared a foreign body of crescentic form, the concavity directed downward. It measured about 2×4 mm. Viewed with the slit-lamp it did not present any of the characteristic appearances of a metallic substance, but gave one the impression of a tiny piece of dark brown Russian leather. There

was a natural attendant iritis, as manifested by an intense posterior bedewing, although a so-called punctate keratitis as clumps or dots on the back of Descemet's membrane did not show up with the lamp.

I did not dare dilate the pupil for fear of the foreign body possibly falling backward. Eserine, rather, was instilled, with the idea of further contracting the pupil, and the patient was referred to the wards. The eye was again photographed, but,

FIG. 2.

Piece of concrete which fragmentized after being removed from the anterior chamber.

as in the earlier plates, no foreign body was recorded, although one was definitely present before our eyes. The patient was subjected to the giant magnet and under the highest power no drag could be elicited. He was then brought to the operating room, and when placed on his back the foreign body slipped gently from a point representing "6 o'clock" to one representing "9 o'clock." There could consequently have been no adhesions binding the foreign body to the iris. The anterior chamber was opened with a keratome at the limbus and Lancaster's hand magnet was applied directly over the foreign body, but still no reaction was manifest, proving emphatically the non-magnetic character of the substance we were dealing with. A pair of Kalt forceps was then introduced into the anterior chamber and the substance removed, breaking into two pieces as it was extracted from the chamber (Fig. 2). It was brittle and felt like a piece of

cinder or concrete. The eye ultimately had to be removed some time after as it still remained irritable, another foreign particle unquestionably being still retained farther back where it could not be seen or reached. A general physical examination revealed no positive information that one could interpret as being an associated or contributory factor in the eye continuing irritable. A condition of interstitial keratitis was in progress, the circulation of blood

FIG. 3.

Tumour of upper lid simulating Meibomian or sebaceous cyst.

corpuscles being clearly detected in the parenchyma of the cornea by the slit-lamp.

Case 2.—A French-Canadian carpenter, aged 32 years, was sent to me by the Canadian National Railroad Company last year. He stated that three months prior to his coming to me a small lump had appeared over his right upper lid, that it was gradually becoming larger, and that recently it was causing the lid to droop. The swelling had never manifested the slightest evidence of inflammation, and the lump had never been tender or painful to the touch (Fig. 3). Vision had been in no way affected. He could not offer any reason for its presence more than an individual can explain that of the average Meibomian cyst. Indeed, it was not unlike a tumour of this character in many respects, except that it seemed to originate somewhat above the upper margin and to the temporal side of the tarsal plate, just beneath the upper ledge

of the orbital wall. If not Meibomian in character it might have suggested a sebaceous cyst, and failing this the very remote possibility of a meningocele. The skin was not red or glistening, and moved freely over the underlying mass, while the tumour itself did not appear to have any deep attachments, but could be readily defined laterally and palpated by the fingers. No element of tenderness could be elicited. There was no maintained ptosis, and the action of the extrinsic muscles was unimpaired. The fundus was normal, and vision was 6/6.

Faced with such an element of interrogation an X-ray photograph was taken, and much to my surprise a narrow band-like

Shadow of foreign body running backward into the orbit.

shadow was thrown from the margin of the frontal bone backward in the direction of the apex of the orbital cavity (Fig. 4).

With the usual aseptic precautions a horizontal incision was made through the skin over the mass and when the orbicularis fibres were separated a glistening long, tiny, sausage-like body presented itself. It proceeded directly backwards into the orbit, not unlike the average meningocele, but unlike those structures it was tough and resistant, apparently attached behind and supported by some hitherto non-defined element within the cyst wall. A pair of artery forceps was attached and traction was applied to facilitate dissection. As this proceeded the capsule broke, and a straw-coloured fibrinous exudate escaped. With the rupture of the capsule a clear view was afforded of two long wooden splinters occupying the cavity, not unlike toothpicks, completely encapsulated, stained a coffee-brown colour and

measuring 3.5 cm. in length (Fig. 5). The completion of the operation and the patient's subsequent recovery were uneventful.

With the previous negative history regarding the source of origin of the tumour, and being again pressed for an explanation, with the assistance of the specimen, the man supplied this rather remarkable story. He stated that when working under a scaffolding three and a half years previously, a piece of wood had fallen from above striking him evidently just above the eyeball. There was no pain or bleeding at the time, no subsequent discolouration of the lid, no impairment of vision; and after the man had

FIG. 5.

Cyst formation about splinter of wood retained in orbit for three and a half years.

recovered from what he considered as a very minor accident he proceeded and continued with his day's work.

Case 3.—An American farmer, aged 51 years, consulted me in 1927. He came over the Border, not with the preconceived idea at this arid time of having a look at the Promised Land, but because his left eye had been causing him a great deal of annoyance at regular intervals for many years. From the man's replies, and after a most insistent interrogation, no history of trauma was provided, and from his statements and descriptions of his symptoms he seemed to have been suffering from some seasonable affliction, such as a vernal catarrh, or possibly from some type of protein reaction, which would clear up for a period only to break out again. The right eye was normal in all particulars.

The left eye was acutely inflamed, circumcorneal injection being particularly pronounced. The anterior surface of the cornea was clear and showed no evidence of a previously penetrating wound; but the posterior surface was relatively beclouded by lymph, although no punctate dots were present on Descemet's membrane.

The iris was distinctly swollen and its tracery blurred, its stroma exhibiting the characteristic greenish colour of an intense iritis. No posterior synechiae at the pupillary margin were present.

At the nasal side, midway between the pupil and the filtration angle, and slightly above the horizontal axis, was a definite mass measuring approximately 1×2 mm. It was fixed to the iris. Viewed with the slit-lamp it appeared to be pearl-grey in its centre with reddish-brown pigment above, and a dense melanotic appearance below. It was definitely raised from the iris surface, to which, as I have already stated, it seemed to be attached like a wart; but it did not seem to be vascularized. A definite posterior bedewing and a more or less albuminous aqueous naturally prevented a clear definition. There was nothing in any way suggestive of a foreign body possessing a metallic character. The lamp showed no lymph exudate on the anterior lens capsule, and no pigment cells or posterior synechiae seemed to have proceeded from the pupillary margin. The optic disc and vessels were normal, there were no opacities in the vitreous, and vision was 6/36, not improved.

With a clear cornea and with an absolutely negative history of trauma, as in case 2, I had to anticipate the possibility of a tiny melanotic sarcoma of the iris associated with an acute iritis. The eye, however, was X-rayed, and an apparent foreign body was localized exactly where I had described my findings on the iris surface (Fig. 6). Magnet reaction was negative. The anterior

FIG. 6.

Tiny particle of stone retained in the eye for thirteen years.

chamber was opened at the limbus, and when the iris was withdrawn a tiny round pebble fell into the lower fornix. Recovery from the operation was uneventful, and the patient's subsequent visual acuity was 6/7. He has remained comfortable ever since.

When the character or source of his trouble was shown him, the patient was only then able to recall the possible origin of his disability. It appeared that when working a potato harvester 13 years earlier a tiny particle of stone must have struck his right eye. Vision, doubtless due to a penetrating wound of the cornea and to loss of aqueous, was blurred for a short time; but by the following day it did not appear to be in any way impaired. The man evidently suffered attacks of sub-acute iritis during the course of the years, which fortunately did not produce very serious complicating sequelae.

You will have noticed, following the recital of these three dissimilar cases, that they vary considerably from those presented in my former contribution; in one in particular, in that the foreign bodies were all non-magnetic. For that reason the discussion previously provided relative to the action of magnets, and to the behaviour of metallic foreign bodies under their influence may at once be put aside. For those who desire further information, I cannot do better than refer them to the very excellent article and appended literature by Franklin and Cordes which appeared in the *Amer. Jl. of Ophthal.*, in July, 1922. But in reviewing the cases, few in number, it is true, there are certain features which must have struck our attention. The point that has attracted mine is, that in spite of ophthalmology being considered a progressive science, only too frequently some one of the more refined sources of diagnosis, if taken alone, is prone to lure us away from the paths of common sense to a road which leads to fallacy or possible disaster. The X-ray, the tuberculin reaction, the Wassermann test, blood counts, and a host of other tests may at times be of value, but at others can best be described as Sirens beckoning us along devious ways to follow erroneous impressions and opinions which the dictates of our human senses, if properly applied, would help us to avoid.

Elements of fallacy arose in each of these three cases; not under every circumstance I grant you, otherwise my argument would be unstable. But take the negative finding of the X-ray in case 1; while unquestionably of value in cases 2 and 3; it failed to reveal a relatively large piece of concrete or cement in one instance, while it detected the presence in another eye of a much smaller particle of stone from which the concrete was undoubtedly made. The slit-lamp overpainted the picture in case 3, while undoubtedly it contributed some element of information in case 1. The final source of fallacy, of course, must be regarded as the instability of

the personal equation when searching for a dependable and intelligent history as in cases 2 and 3. The patient's replies honestly given undoubtedly smeared the issue in each of the last two cases.

This small series of reports is brought forward, each presenting a special feature and each a particular problem, and for that reason they possibly possess some value. They must not be considered as having been reported with any idea of depleting such an inexhaustable subject. That they are fortuitous, I am ready to admit; otherwise I would not have deemed them worthy of your attention.

THE PHENOMENAL VISUAL ACUITIES OF THE EUROPEAN CHIMNEY SWALLOW

BY

S. HOLTH

OSLO

IN Casey A. Wood's "The Fundus Oculi of Birds," Chicago, The Lakeside Press, 1917, the author states that *Hirundo rustica* has a trimacular fundus; one nasal fovea for monomacular vision for far distances and two temporal foveae for bimacular vision in short distances. In the chromolithograph after Arthur W. Head's painting (1c, Plate L) only two of the three foveae are visible; the most external temporal fovea is outside the area of the reproduction.

In July, 1913, I convinced myself that *Hirundo rustica* has phenomenally sharp vision both for far and short distances. In

The dry fly "Black Gnat" on
000 "Hardy" hook (Size 1/1)

bright sunshine the swallows hunted tiny insects—mostly the common midge, *Culex pipiens*—very high up in the air and often in full speed changed the direction in acute angles. Suddenly one of them from at least 20 metres height became interested in my little dry fly "Black Gnat" on 000 "Hardy" hook during trout fishing and rushed down to it; but in about one metre's distance from the dry fly the swallow stopped abruptly with the