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17. Thomas Cartwright (1535-1603). A Puritan. *Dict. Nat. Biog.*
18. Jean Fernel (1506-1588). His *Universa Medicina* was published in folio in 1567.
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20. John Banester (1533-1610).
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24. Penotus. 1602.
25. Laurentius, on Crises.
26. Clowes, the well known English surgeon. Surgeon to St. Bartholomew's Hospital.
27. Leonardus Botallus. *Dr. Curatione per Sanguinis Missionem*. 1583.
28. Willichius. *Urinarum Probationes*. 1582.
29. Rouseus was the author of some works but I have not been able to identify the one mentioned here.

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## REMOVAL OF THE WRONG EYE \*

BY

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THE most terrible disaster which can occur to the ophthalmic surgeon and to his patient is "removal of the wrong eye."

It might be thought that this accident was merely a possible but unlikely danger about which teachers should warn students but which has never actually occurred. That was my impression when I wrote in 1916<sup>8</sup> that by the use of local analgesia "the possibility, however remote, of such a calamity as its (the wrong eye's) removal is totally avoided." At that time I imagined that removal of the wrong eye was a hypothetical possibility rather than an actual fact, a view which had been to some extent previously expressed by Hermann Knapp<sup>2</sup> when he wrote in 1898 ". . . we should be on our guard lest we take the good eye out. This awful mistake is sensationally mentioned in text-books and periodicals; I do not know whether it has actually occurred, but the possibility is undeniable."

Knapp's statement was based on the literature before 1898. Of over sixty text-books on ophthalmology and ophthalmic surgery

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published before that year I have been able to examine thirty-seven in only one of which (Mauthner<sup>1</sup>) is the subject mentioned. Only four of fourteen books published since 1898 contain references and also two later editions of older works (Lawson<sup>3</sup>, Czermak<sup>5</sup>). Recent works do not mention the subject, the Graefe-Saemisch Handbuch<sup>9</sup> (Sattler, 1922), appears to be the latest. Medico-legal text-books are likewise silent. There cannot have been many "text-books and periodicals" in which Hermann Knapp found the subject "sensationally mentioned."

It may be noted that of eight direct references only one is British, the remainder being German and American.

There is, nevertheless, abundant evidence that this catastrophe has actually occurred. Apocryphal stories exist in relation to both eastern and western hemispheres; a well-known one is that of the surgeon, who on discovering his mistake rushed into an adjoining room and shot himself. According to another the patient received a *solatium* of £10,000 and a pension. It is related that in a case (presumably of glioma) in a child, the surgeon, having removed the wrong eye, promptly removed the other one also and explained to the parents that bilateral removal was necessary as the disease always affected both eyes. In this instance, however, it is within the bounds of possibility that the surgeon's error saved the patient's life. Such stories have no value as evidence, their only interest lies in the suggestion that where there is smoke there is probably fire.

The scanty references in the literature mostly contain warnings against the risk of the accident and advice as to how it may be avoided. The method recommended is the indication of the eye to be removed by affixing a piece of adhesive plaster on the brow or in some other way such as by bandaging it. The earliest reference I have found is that of Mauthner<sup>1</sup> who wrote in 1881 that he had been personally present when the mistake was *nearly* made in a case of sympathetic ophthalmia. His own words are worth quoting:—

"Bei der Enucleation, wie sie auf dem Gebiete der sympathischen Leiden kommt, ist aber Eines die Hauptsache, und dies ist, dass man das richtige Auge enucleirt. Das scheint ein müssiger Rath, vielleicht ein Scherz, aber wer wie ich schauernd dabeigekommen, wie statt des erblindeten Auges bald das noch sehende enucleirt worden wäre, scherzt nicht bei diesen Worten. Das Versehen ist nicht so unerklärlich, wenn man bedenkt, dass die Enucleation ja so häufig bei schon entwickelter sympathischer Kyklitis ausgeführt wird, dass im Aussehen der beiden Augen nicht immer ein markanter Unterschied bemerkbar ist, und dass der Operateur, sein ganzes Augenmerk auf die Operation richtend, sich willig vom Assistenten leiten lassend, die Operation an jenem Auge beginnt, in welches der Assistent irrthümlich die Lidhalter

eingelegt. Der Patient rührt sich nicht, denn er ist - - - narcotisiert.”\*

Elschnig<sup>5</sup>, re-editing Czermak's book on ophthalmic operations, quotes Mauthner and adds the following passage:—

“Dasselbe konnte aber, und vielleicht noch leichter, vorkommen wenn es sich um einen intraokulären Tumor handelt, der noch zu keinen Veränderungen am vorderen Augapfelschnitt geführt hat. Da sehen beide Augäpfel ganz gleich und normal aus. Man gebe sich also vor Beginn jeder Enukleation Rechenschaft, welches das zu enukleierende Auge ist, und in Fällen, wo sein Ausseres nicht sicheres Merkzeichen trägt, verlasse man sich nie auf sein Gedächtnis, sondern sehe unmittelbar vorher in seiner Vormerkung nach. Das mag manchem als überflüssige Vorsicht erscheinen, allein beim besten Gedächtnisse *kann* einmal ein Irrthum unterlaufen, und wenn er in einem derartigen Falle unterliefe - - - ist es überflüssig das auszumalen.

(Ein Irrthum ist jedenfalls dann ausgeschlossen, wenn das zu enukleierende Auge vor Beginn der eventuellen Narkose gereinigt und mit einem Heftpflasterbande geschlossen wird.)

(Soll übrigens seither schon tatsächlich vorgekommen sein!).”†

The interesting point in Elschnig's statement is contained in the footnote which shows that, evidently in spite of precautions, a case had occurred within his knowledge.

Haab<sup>4</sup> mentions the danger associated with a general anaesthetic and points out that both eyes may be abnormal in appearance though equally so, as in sympathetic ophthalmia. This condition, however, as a factor in connection with removal of the wrong eye is of little

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\* “In enucleation, as practised in sympathetic affections, it is of chief importance that one enucleates the correct eye. That may appear superfluous advice, even a joke, but one who like myself has stood horrified while the seeing eye was nearly enucleated instead of the blind one will not find amusement in these words. The accident is not so unexplainable when one remembers that enucleation is so often performed in already developed sympathetic cyclitis, that there is not always a pronounced difference in the external appearance of the two eyes, and that the surgeon, all his attention directed towards his operation and willingly allowing himself to be guided by his assistant, begins the operation on the eye in which the assistant has mistakenly inserted the speculum. The patient does not disturb himself, for he is . . . anaesthetised.”

† “The error can even more easily occur when dealing with an intra-ocular tumour which has not caused any changes in the anterior segment of the eye. Both eyeballs appear normal and the same. Before beginning any enucleation one should therefore provide oneself with a statement as to which eye is to be removed, and in cases where no definite external sign is present one should never rely on one's memory but should refer to notes immediately beforehand. That may seem to many a superfluous precaution but even with the best of memories it *is* possible for an error to slip in, and if in such a case it should occur - - - it is unnecessary to say more.

(A mistake can, in any case, be excluded if, before commencing the anaesthesia, the eye to be removed is cleaned and covered with an adhesive plaster).

(Since then a case has already, after all, actually occurred!).”

importance nowadays as the offending eye is usually removed at the earliest sign of change in the other or before any sign has appeared.

Beard<sup>6</sup> writes "That this most deplorable accident is not beyond the realm of the possible has been abundantly proven and that by more than a single instance."

Wood<sup>7</sup> says "Lamentable but, fortunately rare instances have occurred....."

"Near misses" (Mauthner<sup>1</sup>, Lawson<sup>10</sup>) are relatively more common. In these the operation is commenced or about to be commenced on the wrong eye, or wrong side, but the mistake is discovered before serious harm has been done. Conversations with colleagues indicate that many have had experiences of this nature.

There is much evidence that paired or multiple organs can easily be confused. Burrows<sup>11</sup>, writing of operating on the wrong side for hernia states "Such confusion between the left hand and the right appears to be no rare thing in clinical note, taking;....."

Here the error is in the notes rather than in failure to refer to them. The wrong eye has been operated on for cataract, the wrong kidney and the wrong finger have been operated on, and the wrong leg has been amputated (for sarcoma). Innumerable wrong teeth have been extracted: the present writer has made this mistake himself.

For the removal of the wrong eye two postulates are essential:—The patient must be under a general anaesthetic and the eye to be removed must not be obviously different in appearance from the other. Secondary or adjuvant causes include omission to indicate the eye by a mark on the forehead or even delegation of the marking to a nurse or house surgeon, an error in the notes, or omission to verify the eye to be removed by examination or reference to notes immediately before the operation. The surgeon may hurry into the operating theatre where the patient is waiting on the table completely anaesthetised and proceed without delay or further scrutiny to remove "an" eye.

It is evident that advice to mark the eye and the other precautions mentioned, which have been recommended during the last fifty years and are included in the teaching of many ophthalmic surgeons, have not produced the desired results as cases have occurred within recent years. It will, presumably, never be known except to those directly concerned whether the mistake has ever occurred owing to marking of the wrong eye or an error in the case notes but such possibilities constitute the weak point of reliance on any safeguard other than immediate pre-operative examination of the patient in cases in which a general anaesthetic is used.

The diseases concerned, in actual instances, have been intra-ocular tumour, glaucoma, and sympathetic ophthalmia, probably mainly the first. Nothing is known as to even the approximate number of cases. As might be expected, in every known case a general anaesthetic was used.

In infants and young children the risk must be taken and it is the duty of the surgeon to take proper precautions personally, and not to delegate such an important responsibility. The eye should be examined immediately before the operation while the patient is on the table. If a general anaesthetic is to be given either to an adult or to a child administration should not be commenced until the surgeon is present.

The only infallible preventive, if any measure can be infallible, is the use of local analgesia. This method should be adopted in all adult cases in which the eye to be removed is not obviously and distinctly different in external appearance from the other.

A paragraph on this subject should be included in every text-book in which removal of the eye is mentioned.

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## THE INTRA-OCULAR FOREIGN BODY

### A Series of 72 Cases in the B.L.A.

BY

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LONDON

THIS paper is an account of 72 cases of penetrating wounds of the eye with retained intra-ocular foreign body which came to a field hospital in Normandy and a 2,000-bedded General Hospital in Belgium (B.L.A.) from July, 1944, to the end of hostilities in Europe in May, 1945. It is the sequel to a report of 102 such cases, treated from the beginning of General Cunningham's offensive in the Western Desert (M.E.F.) in November, 1941, to the end of