Spencer Wells nearly twelve months afterwards. It proved to be a malignant looking cystic mass, apparently connected with, or formed by, the remnants of the right eye. Two gross swellings. She progressed well until the next morning, when she died somewhat suddenly, it is believed, from embolism.

CASES OF CONGENITAL MALFORMATION OF THE EYES.

Read in the Section of Ophthalmology and Otology at the Annual Meeting of the British Medical Association in Cardiff.

By F. RICHARDSON CROSS, M.B., F.R.C.S., Eng., Ophthalmic Surgeon to the Bristol Royal Infirmary, and to the Bristol Eye Hospital.

Sympathetical Microphthalmia.—F. L., a female child, four months old, was brought for my opinion as to its power of sight. The child was well grown, the head and face well shaped. The orbits were fully developed, but the lids were small and lay deep in the orbit, giving an appearance as if each globe had been enucleated. The lids were usually closed; when open, a mere chink existed between them. This chink (the palpebral fissure), when more closely examined, was of a good length, from side to side, the external canthus being drawn inwards to some extent; the lacrimal passages were well developed, and the caruncle fairly large. Under the lids, imperfect eyes could be recognized, consisting slightly in the direction of a light, or of objects, or of the mother’s voice; and small dark cornea appeared between the narrow palpebral fissures. There was a distinct tendency to inward squint. The movements of the eye were cramped, but the globes could roll fully from side to side. The lids were separated with difficulty, the rim of the palpebral fissure being somewhat tense, and with scarcely any vertical separation. Healthy conjunctiva covered much contracted symmetrical eyeballs. The cornea in each had a diameter of two lines, and projected in front of the rest of the globe in natural proportion. A complete blue-grey iris, with pupil, existed. No further definite examination could be made. But the child seemed to possess very small eyes, of which the various constituents were all atrophied, and in due proportion. Four elder children had been born, quite healthy in every respect, except the third, who died when ten months old.

Dr. Fairbanks, of Wells, writes that, when this third child was born, “the orbital cavities were so small, and the lids so rudimentary, that it was impossible to discover anything resembling an eyeball.” He adds: “I have seen the last child, and it is quite a different condition.

The same child was about two months in utero, the mother was very much frightened by an old tramp, who came into her shop and threatened and abused her. This old woman had peculiarly small and sore eyes, which made a great impression on Mrs. L. the whole time she was carrying the child. When the child was born without eyes, the mother at once attributed it to the maternal infection; she had been told by the old woman. I consider, from a recent examination of L., that the eyes are growing larger, and the power of vision is somewhat improving. Several cases, both of congenital absence of the eye and of its atrophy, have been put on record; but the microphthalmia seldom seems to be symmetrical, nor is the eye usually so perfect as in this case, whilst the apparently complete anophthalmos of the earlier child, adds to its interest.

Iridectasis.—The subject was Daisy C., aged 2 years, a well formed child. The palpebral aperture was narrowed, a broad fold of skin passing from the upper to the lower lid, hiding the canthus. There was constant rolling nystagmus, the eyes were well shaped, and perhaps rather small. The child looked towards shining objects (watch, silver pencil-case), but without any power of fixation. It was said to find its way about the nursery, avoiding obstacles; and it was believed to recognize jam on bread, and to choose this in preference to butter; but the power of vision was much impaired. The eye did not seem particularly oversensitive to light. The cornea, sclerotic, and globe of the eye appeared perfectly normal. The iris was entirely absent.

Iridectomy was performed several days ago an appearance of an iris; but, without any leading from him, the fact was brought to the notice of a most intelligent man, volunteered the information that the child had been holding objects more closely to the eye. This statement might be of importance as showing the presence of the ciliary muscle.

Direct examination with the ophthalmoscope showed a perfectly clear red rim round the lens. The lens appeared cloudy in places, according to the direction of the mirror; and the shadow passed in every direction, as in myopia. The fundus was pale red, with well defined retinal and choroidal vessels. The discs appeared white, with irregular edges, line vessels in the neighbourhood being tortuous. There was no posterior staphylomas, nor atrophic patch. The appearance suggested a former neiritis, but was such as is not infrequently seen in hypermetropia.

I will not trust myself to speak of the presence or absence of the ciliary processes in this case, as I find no special note of it, and have had no opportunity of repeating the examination. Some authors allege that these processes can be clearly seen in cases of iridectomy; whilst others, on the contrary, assert that they are absent. Their absence is rendered probable by the fact, that they are developed with the iris from the front part of the outer layer of the optic vesicle blending with the mesoblast, which partly passes in front of the lens to form the iris, and partly becomes bent back at the lens-epithelium to form the ciliary body and pars ciliaris retinae; whilst the ora serrata is the developed anterior edge of the inner wall of the optic vesicle.

As I am credibly informed, the mother, who had given birth to two other healthy children, asked, directly this child was born, about its eyes. She expected something wrong; for she had been frightened at two months by a dog biting her, and, a little later, by the man-cook who was trying to stab a servant in the kitchen.

In each case, the staring eye was the main impression made upon the mother’s mind.

ON THE SURGICAL, PHYSIOLOGICAL, AND AESTHETIC ADVANTAGES OF THE ARTIFICIAL VITREOUS BODY.

Read in the Section of Ophthalmology and Otology at the Annual Meeting of the British Medical Association in Cardiff.

By P. H. MULES, M.D., Surgeon to the Eye Hospital, Manchester.

The introduction of any surgical innovation is fraught with extreme peril. Surgical triumph is followed by surgical catastrophe, and the advance of science is marked by the progress of civilisation. When a new departure is indicated, which is bolder in conception than has hitherto obtained, and requires for its successful carrying out strict personal supervision and attention to minute details. The disease of the eye which has specially interested surgeons, and been the subject of what we may term more speculative ophthalmology than any other, is known to pathologists as “sympathetic ophthalmitis.” It is not my province here to enter fully into the views held by equally competent observers; at the same time, I cannot explain the reasons for the operation indicated above, without touching upon the one that led me to adopt it. The sympathetic ophthalmia, or disease of a sound eye, caused by injury to its fellow, was brought to the notice of the professor by Mackenzie of Glasgow (On Diseases of the Eye, 1840). He referred to it as well known to his colleagues and himself, and, as the name implies, attributed it to nerve-sympathy, or, in modern terms, a “reflex neuritis.” This theory has grown into a general acceptance, and even now there are many believers in the sympathetic origin of the disease. Be that as it may, a school has arisen which refers the disease to “bacteria,” having its first point of localisation in the uveal tissue, there producing a specific uveitis with germs. “Bacteroid bodies,” capable of self-propagation along the perineural lymph-spaces of the first affected eye, across the chiasma, and down the lymph-spaces of the sound eye, reproducing a similar affection, often with disastrous results. Holding this view, I designed, for the prevention of sympathetic disease, or, as we now term it, “ecirisation of the globe,” on the lines hereinafter laid down, to be associated in suitable cases with the use of the “artificial vitreous body.” It is right here to state that the operation of “ecirisation” has been occasionally practised by surgeons as an emergency-treatment, but the perfection of the object has been, so far, impossible. Perfect faith in the bacterial origin of this affection led me to the steps hereinafter named; for it

1 This has been demonstrated by Max Knies.
2 Mules, Hirschberg’s Centralblatt für Augenheilkunde, 1885.
4 Vide Transactions of Ophthalmological Society, meeting in March, 1885; discussion on a paper by P. H. Mules.
5 Pamphlet by Dr. Grafe.
was not enough to eviscerate the intra-ocular contents, and leave only a small button of sclera on which to plant an artificial eye (immeasurably superior as it is to the operation of enucleation); and, following out the logical sequence, that total exemption from the inconveniences of sympathetic diseases being assured by early removal of all the uvea, the introduction of a permanent hollow glass sphere within the denuded sclera could produce no ill effects, the result has fully realised the most sanguine expectations. To attain this end, the following steps, carried out with a scrupulous attention to detail, are necessary. Any eye may be eviscerated, except such as are infected with tubercle, gonia, sarcoma, or any other known growth. Small stumps, when painful, can be opened, cleansed, bone or foreign bodies removed, and the pain and unseasiness disappear, leaving a smaller stump, but safe from danger to the sound eye, except in those instances where bacterioid bodies have travelled beyond the globe. Even then it is a fair assumption that no more harm could possibly accrue than if the stump was enucleated.

The instruments necessary for the due performance of the operations are: 1, a hand-spray; 2, a siphon-tube of India-rubber to flood the eye after or during operation; 3, an ample supply of solution of corrosive sublimate (1 to 1,000); 4, an eye-speculum; 5, fixing and dressing forceps, two pairs; 6, a Gräfe’s knife; 7, a spoon to evacuate contents (Bunge, of Halle, has devised an instrument, but any scoop answers equally well); 8, needles threaded with chromised catgut (fine size); 9, artificial vitreous bodies in assorted sizes; 10, dressings, namely, iodiform, wood-wool pads in Lister’s gauze, oiled silk, glycocine, boracic or sublimated bandages.

The operation is divided into two parts. The first part, complete in itself, is evisceration. It is conducted as follows.

1. Anaesthetise the patient.
2. Use the hand-spray, and thoroughly cleanse and disinfect the appendages with 1 to 1,000 solution of corrosive sublimate.
3. Transfix and remove the front of the eye with a Gräfe’s knife at the corneo-scleral margin, cutting round the conjunctiva first.
4. Empty the contents of the globe in any way that is convenient, taking special care to remove the ciliary body and choroid, leaving a clean white sclera.
5. With a thin India-rubber tube (Inst. 2), used siphonwise, run the sublimbate solution into the emptied globe; during the performance of the operation, it will help to arrest bleeding.
6. Select the needles, slightly curved, for sewing up, and threaded with gut.

And here, if we please, we may leave the patient, secure in the knowledge that sympathetic disease will not attack the other eye, except under most exceptional circumstances, and that he will possess a movable, though very small, stump on which to adjust an artificial eye; but where a perfect aesthetic result is sought after, especially in children, for reasons heretofore stated, we advance another stage, and, before sewing up the sclera.

7. Take the glass sphere best suited to the case, slit the sclera vertically, until the sphere will with difficulty enter the cavity. This difficulty only refers to introducing the globe; when it is in, the sclera should unite easily without any tension, and leave no awkward angles; therefore, the largest sphere fulfilling these conditions is the best; finally, sew up carefully with strong chromised catgut, taking care to get the seretal edges into apposition. Five stitches are generally sufficient. Lastly, draw conjunctiva over, and unite on right angle to the seretal wound.
8. Spread a thick layer of finely powdered iodiform over the whole conjunctiva, and dress with salicylic-wool in a double layer of Lister’s gauze.

9. Keep the patient in bed for three days, and dress with hand spray, till all risk of septic trouble has passed over.

Should you succeed in keeping the wound aseptic, the reaction is comparatively trivial; if suppuration ensue, the pain and distress may be severe, the orbit becoming infiltrated, and the sclera may slough away. I cannot lay too much stress upon perfect asepticity. The operation will be fraught with full precautions for its attainment; in any case, it is well to warn the patient that he may have pain in and around the orbit for a week.

Union is in most cases rapid. A firm round globe results, retaining all the associated movements of maximum, and capable of carrying an artificial eye which, when carefully centred and moulded, absolutely defies detection. The stump is insensible to manipulation, so that it seems impossible to remove it by force.

In selecting eyes for an artificial vitreous body, it is obvious that shrunken globes must be passed over, as also those in which the conjunctiva is in a sloughy condition, as after burns, or destruction of the eye from gonorrhoeal ophthalmia; but, when the eye is of fair size, and the conjunctiva healthy, however dismissed the contents of the globe, and especially in extensive fresh wounds, where primary enucleation is the alternative, the artificial vitreous body can be advantageously used. Below is a table comparing the operation with that of enucleation.

**Enucleation.**

2. Displacement of all muscular relations, and arrest of movements.
3. Cicatricial bands are a frequent accompaniment of enucleation. The introduction of an artificial eye is thus rendered very difficult, and secondary operations necessitated.
4. Constrictions, specially towards the orbital apex, occur, making new eyes a necessity, and preventing all chance of a good fit. So, also, the sinking of the glass eye and distortion of the lids is constant.
5. The lower sulcus of the conjunctiva being constantly pressed upon by the lower edge of the glass eye—which, indeed, rests upon it—rough granulation, ulcerations, and thickening occur, which necessitate non-wearing of the eye for lengthened periods, and may induce sympathetic irritation of the sound eye.
6. The removal of an eye is a terrible operation to the mind of the patient, more especially an ill-fitting glass eye are so common that there is no solace to be gained from their contemplation, many promising lives having been wrecked through the shrinking from publicity caused by the self-consciousness of an ill-fitting glass eye.
7. Arrested development of the orbit in young children.

**Evisceration and Artificial Vitreous.**

1. Retention of the framework of the eye.
2. Perfect harmony of muscular movements retained.
3. No bands ever occur after enucleation, unless through burns or other destructive agencies of a similar nature.
4. A definite size of globe being introduced, no change ever occurs after the parts have quieted down, in from six weeks to two months; nor can there be either sinking of eye or distortion of lids.
5. A glance at Fig. 2 will explain that the grave mischance, mentioned in Enucleation 5, cannot exist with the artificial vitreous body, as the concavity of the artificial eye, being kept closely applied to the convex globe by the lids and atmospheric pressure, is lifted up, and rarely touches the inferior sulcus.
6. An artificial eye which defies detection must exercise an important influence over the mental, bodily, and social status of the wearer.

7. Orbital development is successfully encouraged to continue.

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**Fig. 1.**—After enucleation. A. Cavity of orbit lined with conjunctiva. B. Artificial eye, hung in orbital cavity. C. Lower edge of eye pressing on inferior sulcus; a source of granulation, ulceration, and epiptysis. D. Muscles, nerves, and vessels marked together.

**Fig. 2.**—After evisceration. Artificial vitreous body in situ. A. Artificial vitreous body. B. Artificial eye, applied over globe. C. Inferior sulcus of conjunctiva, showing freedom from pressure of edge of eye. D. Sclera. E. Muscles in situ.
result, so far, is perfect. A second has used it eight months; I have not seen him since, but know he is well, and others of later date.

Let me again point out that, in young children, enucleation is followed by arrested development of the orbit. This is an interesting physiological fact, the importance of which cosmetically cannot be overstated. It is allowed by most competent observers that the introduction of the artificial vitreous body will encourage the normal growth of the orbit, and assist to maintain symmetry of feature.

The advantage of the operation is again manifest when I tell you that it may be undertaken at any age from three months to seventy years, with equal facility and absence of risk. Lastly, I look forward to the placing of the pathology of sympathetic disease upon a basis absolutely incontrovertible through the medium of this operation; for I submit that, should we succeed in preventing secondary inflammatory attacks of the sound eye, we shall have reduced the bacterial origin of sympathetic disease to a demonstration.

Note.—The correct fitting of an artificial eye being a point of the highest importance, it behoves the surgeon to see for himself and unhesitatingly reject such as do not fit accurately, and the movements of which are not free in every direction; otherwise the irritation caused by the pressure of an opposing edge, will destroy the benefit likely to accrue to the patient from the original operation. Messrs. Armstrong, of Deansgate, Manchester, have interested themselves much in this matter, and I have suggested to them to keep a supply of assorted sizes of the artificial vitreous body. (See Figs. 3 to 6.)

Figs. 3 to 6.—Artificial vitreous body in useful sizes.

**ENUCLEATION OF THE EYEBALL, WITH OBLITERATION OF THE CONJUNCTIVAL SAC.**

Read in the Section of Ophthalmology and Otology at the Annual Meeting of the British Medical Association in Cardiff.

**BY EWDMY ANDREW, M.D.,** Surgeon to the Shropshire Eye, Ear, and Throat Hospital, Shrewsbury.

Past experience in eye-surgery has never yet caused me to regret removing an eyeball, but, on more than one occasion, to bitterly lament the evil which has resulted from leaving an injured eye, either from mistaken diagnosis of the case, or from the determined opposition of the patient or others.

As the loss of one eye is a slight evil compared with blindness, and as one good eye, except in a few instances, is sufficient for all practical purposes in life, and far better than two seeing eyes, where one is sufficiently defective to render the other less acute; I have been surprised, in consultations, at the desire of some surgeons to watch and preserve such defective balls, and, still more, where such leniency has been continued to a blind eye, which may become destructive to its fellow.

Delay in sympathetic eye-disease is so disastrous, that it is to be decried that surgeons are still divided in their views on the matter; for, while most surgeons would be agreed as to the necessity of immediate excision in a lacerated wound of the ciliary region, with involvement of iris, turbid media, injection, pain, almost loss of vision in the one eye, with intolerance and lacrimation in the other eye, and would counsel waiting in a clean incised ciliary wound with fair vision, and the fellow eye unaffected, still, between these two extremes, medical opinion would vary almost as much as the various conditions.

The history of sympathetic inflammation has been most unsatisfactory; the majority of the cases have gone from bad to worse, and all treatment has been of little avail, except prevention by early excision of the exciting ball.

Fortunately, no case has been recorded where some days have not elapsed between the injury and setting up of sympathetic inflammation, thus giving some time for watching the first symptoms, which, should they indicate excision, cannot be done too early.

There are few, if any, good reasons for retaining a damaged eyeball which has been injured. In a child, the loss of the eyeball certainly causes, at times, orbital deformity, but growth is, or even this disadvantage could not, for a moment be considered, should dangerous symptoms appear. In a child, sympathetic inflammation is most easily set up, and is most destructive; and, as such young patients too often are unable to explain or estimate their condition, even so prompt an operation as that required in a more swollen eye will be more promptly required. Again, in pannus-epithelitis, the danger of inflammation being a point of secondary importance, if inflammation has been exaggerated; and, in my practice, unless there has been high temperature, I have unhesitatingly excised, with advantage, all such balls, and found excision far preferable, and relief far more rapid, than from an incision through the front of the ball. In such operations, I have generally taken the precaution to carry out the various steps of the operation through the incision, for, if the operation through the front of the ball will save the retina, the incision through the front of the ball will save the eyeball.

Further, I have yet to learn the utility of preserving any useless ball or stump, whether due to injury or to disease; for, although such balls may never excite sympathetic irritation, I consider they too often have a weakening power on the opposite eye, and render it less able to withstand injury or disease. If they have this injurious influence, the rule should be to remove all such diseased organs when the patient will consent, and not to wait till such balls become inflamed or ossified, and set up sympathetic disease. Even for appearance sake, the substitution of an artificial eye, or the obliteration of the socket, will be an improvement.

Without going into the vexed question whether sympathetic disease is transmitted by the vascular, lymphatic, or nervous system; whether due to septic origin; whether sympathetic irritation is or is not a pure neurosis, and is or is not a forerunner of sympathetic inflammation—one thing is certain, that far too much blindness exists in the present day which could have been prevented by an early excision.

Any symptoms, therefore, which tend to make one eye more prominent, are not undesirable; and it has seemed to me, from the study of a number of cases, although I mention it with some difference, that, before there is any marked sign of sympathetic disease, there is frequently a previous stage, indicated by a diminution of distant vision (near sight being unaffected), and by a lessened power of the dila-tability of the pupil under atropine.

Having formed this layer of carbolic acid or water or oil. Undoubtedly, symptoms apparently dangerous do yield to ordinary treatment, especially in the well-to-do class, who, by their power of obtaining early advice, good food, skilled nursing, and, by their willingness to keep the eyes at rest for weeks and even months, are able to keep an injured ball in its socket, and, perhaps, cover its deformity, at a later date, to the advantage of a normal eye, which has been kept free from inflammation in the meantime, and has, unless (besides warding off sympathetic inflammation) restore a damaged eye to an useful condition, is a snare; for too frequently, by such means, weakness is left in both eyes, a greater liability to future disease is incurred, and much time is lost, which can be ill spared by the patient. In this class, unless fair vision can probably be regained, there is not much urge to hope for any such change.

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