structure. Scrapings of the nodules showed, under the microscope, the well-known clubs, two or three clubs being often attached to a single filament. Sections made after embedding in celloidin were stained with Plaut's method, and also with fuchsin and methyl-blue. They were studded with numerous actinomycetes, the circles being large, and surrounded by the character-

Fig. 2.—Actinomycosis from tongue of ox for comparison.

istic rays or club-shaped bodies (see Fig. 1) I could not observe prolongation of filaments into the centre of the mass, as I have figured them in Fig. 2. I did not detect any essential difference between these specimens and those I had examined from oxen (see Fig. 2). The circles, however, appeared wider, the granular centres more extensive, and the separate centres of growth remained distinct, instead of forming irregular and mulberry-shaped masses.

REMARKS.—This case appears quite typical of the usual course of actinomycosis, namely, in its slow progress—the duration of the disease being a year and three months—in the absence of acute symptoms, severe pain or fever—in the appearance of a fluctuating point from which only granulation-tissue was evacuated by incision, and the subsequent formation of numerous sinuses, with undermining of the skin. This combination of symptoms, coupled with the exclusion of syphilis, abscess, and hydatid, convinced me that I had to deal with a case of actinomycosis, although I could not find the fungus during the life of the patient. The pain complained of at the early period of the disease was probably due to local peritonitis, and ceased when adhesions had formed between the liver and abdominal parietes. The organism probably gained access to the liver through the intestine.¹

A CASE OF OSSIFICATION OF THE CHOROID.²

By E. F. DRAKE BROCKMAN, F.R.C.S.,
Surgeon-Major, Madras Army.

THE case which I wish to submit for the consideration of the members of this Branch will, I think, prove of interest in two chief ways, first, in reference to the rarity of the affection; and, secondly, in reference to the extraordinary changes to which, under some circumstances, the vascular structures of the eye are liable. I have brought here this afternoon a section of an eyeball in which an ossific change has occurred; also some dry sections of the bony formation mounted for microscopic investigation, and two sketches in sepia and chalk of the bony structure.

1. As regards the rarity of the affection. Among fifteen authors who have treated on diseases of the eye, I find eight have referred to this subject in a casual manner, four have given a fuller account of the pathological condition, and three have omitted mention of it altogether. The most elaborate description appears

in De Wecker's classical work, entitled, *Traité Complet d'Ophthalmologie*. I have also searched in the records of the Ophthalmological Society, in the *Transactions of the Pathological Society*, in the reports of the Ophthalmic Hospital at Moorfields, and in the *Archives d'Ophthalmologie*, and I find that the reported cases of this nature are, comparatively speaking, few in number. Among the large number of patients who have passed under my observation at the Ophthalmic Hospital, Madras, and among the numerous eyeballs I have dissected after enucleation, this is the first specimen of ossific change in the eyeball with which I have met. At one of the meetings of the Ophthalmological Society in London in 1884, a similar case was exhibited by Mr. Adams Frost, which I was fortunate enough to see. To us, therefore, who are here present, and who, perhaps, have not many opportunities of studying eye-diseases, this specimen will, I trust, be of interest on account of its rarity at least.

2. The second point of interest has reference to the peculiar metamorphosis which the soft vascular coat of the eyeball is capable of undergoing under diseased conditions. Such decided ossific changes are, as far as I am aware, unknown in other parts of the vascular system of the body, and the primary cause for its appearance in the choroid has been usually regarded as inflammatory in its nature. Fibrinous lymph appears to have been thrown out at first as a result of the inflammatory action in the vascular tissue, which afterwards undergoes developmental changes into fibrous tissue, and subsequently into bone structure. This process must not be confused with petrification or calcification of a pre-existing structure. The latter, being an infiltration of a tissue with calcic phosphates and calcic carbonates in a solid form, is distinctly degenerate in its character, and must be regarded as a retrogressive change in a tissue of a more elaborate nature to one of less histological importance. Although these processes are of so decidedly opposite a nature, either can prove equally productive of mischief when present in the tissues of the eyeball.

Ossification of choroid, dry section $\times 50$.

It is a remarkable fact, which has received verification by the observations of many oculist-pathologists, that neither in the iris nor in the ciliary body has true ossification been known to occur, although these structures are regarded as the direct anatomical continuation of the choroid anteriorly. These tissues are known to be liable to calcification and pseudo-osseous formations, but not to the development of true bony structure. The layer of the choroid in which the initial changes are said to take place is that which is known as the *lamina vitrea*, which lies in apposition with the chorio-capillaris layer and separates this layer from the retina.

"The chorio-capillaris, so rich in vessels, sets free the essential materials for the formation of the osseous masses, which terminate in their development at the point where the chorio-capillaris terminates." De Wecker, from whose work I have translated the preceding passage, goes on to say: "The diseases, which chiefly predispose to an ossification of the choroid are those forms of chorioiditis which follow on injuries." Others are of opinion that an irido-choroiditis of idiopathic origin is equally powerful in bringing about osseous formation in the choroid; and in the case which I am about to relate a preceding syphilitic irido-choroiditis

¹ The above account was written six months ago.

² Read at the meeting of the South Indian and Madras Branch of the British Medical Association on October 12th, 1888.

appears to have been the immediate cause of the ossification of the choroid.

The organ in which these remarkable changes occur is rendered useless, and, as regards the eye, the importance is perhaps greater from the fact that sympathetic inflammation of the opposite eye will sooner or later be set up, and lead to complete destruction of sight in it. Various theories have been advanced to account for the production of sympathetic inflammation. Into these it is not necessary to enter now. However, in the case before us I believe the inflammation of the second eye was caused by the direct irritation of the ciliary nerves by the ossific (foreign) material lying in close contact with them, and in which, perhaps, they had also become incorporated.

With these preliminary remarks I shall now read the notes which I have made of the case.

Poongavanam, aged 38 years, was admitted into the Ophthalmic Hospital on April 5th, 1888, complaining of complete loss of vision of the left eye and steady and rapid impairment of vision of the right eye. His previous history is to the effect that he was admitted into the Ophthalmic Hospital in 1887 for synechia of syphilitic iritis, for which he was treated by increasing doses of iodide of potassium. The improvement in the left eye was limited; and as the organ continued to be sensitive on palpation, and as all sense of sight had entirely gone, he was advised to submit to enucleation. To this he objected, and left the hospital. He returned on April 5th, 1888, and urgently sought admission into hospital, at the same time requesting that the left eyeball might be removed. His reason for making the request was that he felt that the diseased stump of the left eye was injuriously affecting the right eye by causing serious deterioration of vision in it. He had now well-marked signs of insidious irido-cyclitis of the right eye; the eyeball was congested; a well-defined ciliary zone of vessels of a dusky purplish hue surrounded the corneal margin; the aqueous was muddy; the striated appearance of the iris structure was very distinct, especially at its lower half; the pupil was irregularly dilated, and the posterior synechia at the upper and inner margin held this structure down to the anterior capsule of the lens. On the anterior surface of the upper part of the iris small nodular masses of lymph were to be seen. The posterior surface of the cornea was also rendered uneven by the deposit of inflammatory lymph upon its surface, and its anterior surface was rough and uneven, and showed evidences of breaking up of tissue. These changes were accompanied by profuse lachrymation and extreme photophobia. The vision was very greatly impaired, the patient being only able to decipher the test dots at 2 metres.

The left eye presented merely a shrunken globe, the result of previous inflammatory action. The organ was very hard to the touch, and palpation caused considerable pain.

April 7th. Two days after admission the left eyeball was removed under chloroform without difficulty. The patient supported the operation well.

April 12th. Immediately after the removal of the offending globe the right eye began to show signs of improvement; the lachrymation and photophobia, which were formerly so excessive, had diminished to a very marked extent; and on this date it is noted that the congestion of the eyeball was rapidly abating. Since the operation the patient was placed on five-grain doses of iodide of potassium thrice daily, and one-sixteenth of a grain of corrosive sublimate twice a day in pill. The cavity of the left orbit was daily cleansed by syringing with carbolic acid lotion.

On the 20th the doses of the iodide of potassium were increased to 7 grains, and the pills were continued.

April 24th. On this date the eye presented the following conditions:—Corneal surface more polished and brilliant; the scleral and conjunctival congestion has abated to a very marked extent; the aqueous is clear; the pupil is evenly dilated, under the influence of atropine, to about 7 mm.; the neoplastic deposits on the anterior surface of the iris are no longer to be seen, nor any traces of pigment deposit on the anterior capsule of the lens to mark the points of posterior synechia. T+2.

By ophthalmoscopic illumination the dioptric media are more transparent, but do not permit of a ready examination of the fundus. No details can be made out. The potassic iodide was increased to 10 grains thrice a day.

The patient continued to make steady progress towards recovery, and on May 8th I noted that all conjunctival, subconjunctival, and scleral congestion had subsided; the cornea had regained its normal transparency; the aqueous was clear; the iris structure

was normal in appearance, and no remains of the neoplastic deposits were visible.

By the ophthalmoscope the fundus can be readily illuminated; the muddy state of the vitreous has almost entirely disappeared; no muscae visibiles; the O. P. is slightly congested, but in other respects the fundus may be regarded as normal in appearance. He is able to count the test dots readily at 4 metres.

On account of the overcrowded state of the ward he was discharged from hospital, and directed to attend in the out-patients' department for further treatment.

In this case the recovery of sight in the right eye clearly hinged on the removal of the left eyeball, which had passed through a series of remarkable changes, and which was producing rapid loss of sight by sympathetic inflammation.

A CASE OF IDIOPATHIC TETANUS: RECOVERY.¹

By J. HEADLEY NEALE, M.B., M.R.C.P. LOND.,

Assistant-Physician to the Leicester Infirmary.

THE comparative rareness of this form of tetanus in this country induces me to make a brief record of the following case:

On May 5th, 1888, I was asked to see W. B., aged 12, a high-spirited but delicate schoolboy, who was said to be suffering from a "severe cold." I learned that, five days previously, he had been playing with some schoolfellows in an enclosure in front of some houses in a comparatively new and badly drained district, in the outskirts of the town, wherein grew a few young fir-trees; and beneath them nothing but hassocks, showing the marshy nature of the soil. After getting heated in play, he had lain for some time upon the grass among the hassocks. When I saw him, the chief things he complained about were stiffness of the lower jaw, aching all over his body, and intense pain when he attempted to open his mouth. This he could only manage to do with the greatest difficulty, sufficiently to allow of the tip of the tongue to be extruded for about three-quarters of an inch. Once opened to this extent, closure was easily effected, showing the degree of affection of different groups of muscles. I regarded the case as one of rheumatism, and prescribed salicylate of sodium, but I very soon had to alter my diagnosis to that of "idiopathic tetanus."

The symptoms increased in severity; although the jaw was never completely "locked," the report that at night-time he was constantly awakened by his jaws snapping, so that his tongue was severely bitten, and the "risus sardonius" having become well marked, placed the diagnosis beyond doubt. The patient was placed upon full doses of bromide of potassium and chloral hydrate, administered every two hours. Regarding the case as serious, I called in my colleague, Mr. C. J. Bond, who confirmed the diagnosis, while together we made a more systematic examination of the patient.

The disease exhibited, to a well-marked but not exaggerated degree, the type of orthotonos. The abdominal muscles, and notably the inter-transverse portions of the "rectus abdominis," stood out in bold relief, suggesting rather the appearance of a well-trained athlete than of a delicate schoolboy; while the erector muscles of the spine were equally in a state of tension; and we could only lift a leg as a whole, like a rigid stick, for a very short distance, great pain attending the act. The tongue was thickly coated, and the bowels constipated; slight pain was complained of at the xiphi-sternum, but was more marked in the back between the angles of the scapulae; there was some dorsi-flexion of the head and neck, no opisthotonos, but a general condition of rigidity; and absolutely no breach of continuity.

In addition to the treatment mentioned, constant alimentation was kept up with predigested liquid food (milk, beef-tea, etc.), while the bowels were relieved with oil enemata, and a black rubber gag fixed between the teeth at night.

As regarded the probable termination of the case, two factors enabled me to venture upon a favourable prognosis. (1) Throughout the whole illness the temperature was never much above 100° F., and (2) the muscles of respiration were not seriously involved. The little patient successfully tided over the supposed critical twelfth day, and made an uninterrupted recovery, so much so that I ceased attendance on June 2nd, or thirty-three days from

¹ Read before the Midland Medical Society, Birmingham.