coming to take him away, and occasional violence of behaviour. Iodide of potassium and bromide of potassium with ammonia were administered, and it was found that the application of an ice bag for a few minutes during the violent paroxysms at once controlled his violence, and generally resulted in a quiet sleep.

On April 25th, after apparently progressing more satisfactorily with regard to his strength, he had five well defined epileptic attacks, lasting for three or more minutes, with the same characteristics as the former attacks, with intervals of about twenty minutes between them; but it was noticed that immediately after these attacks he looked about him and tried to see things, although he could not describe anything that he might have seen, as he was still incoherent.

After this, with the exception of occasional attacks of violence, the patient went on gradually gaining strength, until on June 11th he recognised me when I came into the room, and very shortly afterwards the delusions were cleared away, and some power of coherent thought was gradually established. The return of sight was most curious to watch. Everything seen was out of proportion; for instance, a large screen appeared to him like a small picture, the ceiling seemed to be within reach of his hand, and colour blindness was present for some days after this period. He was able to sit up a little on June 23rd, and went on making a good recovery until July 31st, when attempting to do a little business quite against my advice, an epileptic attack occurred lasting for ten or twelve minutes, having the same characteristics as those previously described.

State One Year after the Accident.—He is cheerful, and has gained strength, and completely regained his memory with regard to things which occurred before the accident; but the accident itself and the subsequent events of three months and a half are buried in oblivion. The sight has returned perfectly, and he will soon be able to return to business. There is no confusion of ideas or headache, and, in fact, the brain functions are now perfect.

In this case there were evidently two entirely separate lesions, one involving the left motor area as indicated by the Jacksonian epilepsy, the attack commencing in the right hand and the conjugate deviation of the head and eyes to the right. These convulsions were evidently due in the first place to the cerebritis surrounding the effused blood, and possibly to a depressed and splintered inner table of the parietal bone on the left side. Had the state of the patient allowed, I should certainly have trephined at this point, but taking into consideration the probable state of the base of the skull and the general condition of the patient, I shrank from exposing him to the additional shock that this operation would cause him, whilst not disregarding the mechanical effects of the trephining upon the grave bone lesions at the base of the skull. The fracture of the base probably involved the cribriform plate of the ethmoid, as shown by the hæmorrhage from the nose, which could not be explained otherwise as there was no sign of direct violence in this region, and the oozing of a thin sanious fluid occurring during the first week after the accident. Thus the ultimate danger of infection by sepsis was prominent.

The left orbital plate was probably fractured by a fissure extending diagonally across the base through the sphenoidal fissure on the right side, involving the sixth nerve and ophthalmic vein. My reason for saying this is the presence of the internal strabismus, which, though less, is still present. The total blindness is most difficult to explain, taking into consideration the lapse of time before sight was re-established. It was probably due to the pressure of extravasated blood at the base, involving both optic nerves or the optic chiasma, or both optic tracts, more likely the nerves. The light reflex arc from the retina, *via* the optic nerve, tract, and geniculate bodies and third nerves was at first present and disappeared later; this renders the supposition of progressive hæmorrhagic pressure more likely. The hæmorrhage into the left orbit would account for the ptosis by pressure. I may add that it was the opinion of an eminent expert who, having heard of the case, wrote to me more than once that in all probability there was division of the optic nerves, and I feared that this was the case in consequence of the lapse of time which occurred before the recovery of sight. I cannot complete these notes without thanking my assistant, Mr.

Gilbert Kempe, and also the nurses from the Salisbury Nurses' Home, for the invaluable assistance they afforded me, which so much contributed to the happy termination of a most anxious case.

TWO CASES OF DEPRESSED FRACTURE OF THE SKULL.

G. B., aged 15, was seen on the evening of March 18th, 1897. He had been kicked by a horse about two hours previously. He was sensible, answered questions rationally, but was much collapsed. Upon examination, I found a ragged lacerated wound the size of a florin at the junction of the coronal and sagittal sutures, and a small incised wound $\frac{3}{4}$ inch long between this and the right ear. The hæmorrhage was extremely free, and the collapse was increasing. Beneath the former wound the skull could be felt fractured and depressed over an area the size of a five-shilling piece. I enlarged the wound by a crucial incision, and removed depressed fragments of many sizes, the largest being $1\frac{1}{2}$ by 1 inch. The depressed fragments were denuded of periosteum and fissured in every direction; therefore I did not think it safe merely to raise them and leave them *in situ*.

There was a wound in the dura mater, and brain substance was observed in the wound. It was important to arrest the hæmorrhage, which apparently proceeded from the fracture extending into the longitudinal sinus, and was very profuse, and from the edges of the fractured bone and also from between the dura mater and skull. That from the edges of the bone was arrested by the application of aseptic wax as recommended by Professor Victor Horsley, and which succeeded admirably. Firm pressure of the dressing arrested the remaining hæmorrhage. In addition to the serious lesion described above, the outer table of the parietal bone on the right side was depressed, and also there was considerable subconjunctival effusion of the right eye with a very marked proptosis, this being strong evidence of a fracture of the base in addition to the other injuries. This patient is making a most satisfactory recovery, and the wound is granulating rapidly. The proptosis is gradually becoming less prominent, and the lad, although very dull, is able to answer questions, and, as far as one can foretell, will make a good recovery.

W. P., aged 17, admitted to the Salisbury Infirmary on March 1st, 1897, was leading a horse, which kicked him on the head. He lay unconscious for a short time, and then walked home a distance of a quarter of a mile. Two hours after, on admission, he was unconscious and his limbs were twitching. There was a wound of 4 inches long over the left frontal bone, extending from the middle of the vault of the skull to the inner angle of the left orbit, down to the bone, which was in fragments. There was evidence of brain substance in the wound, the result of a minute wound of the dura mater. My colleague, Mr. Luckham, in my absence, seeing that there was no time to lose, enlarged the wound and removed the loose fragments, and the lad has made a most satisfactory recovery. The temperature never rose above 100.8°, and the case caused no anxiety.

With regard to these two last cases, youth and unimpaired constitutions—the result of a hard-working, not overfed, out-of-door life—may have been factors conducive to the somewhat rapid recoveries from such serious injuries, added to the fact that the treatment was prompt and antiseptic rigidly carried out. The cyanide dressings were used. In the last case the hardihood of our agricultural labourer is evidenced by the walk of a quarter of a mile with such a serious head injury as the subsequent operation proved to be in existence.

A CASE OF RECOVERY FROM ALBUMINURIC RETINITIS, WITH REMARKS AS TO PROGNOSIS.

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THE following case possesses considerable clinical interest of a twofold character. To the physician it is of great importance in relation to the important question of the prognosis as to the duration of life in albuminuric retinitis, and to the

ophthalmologist it is instructive to note what degree of vision is possible after a tolerably severe attack of albuminuric retinitis.

Mrs. S., aged 65 years, about the beginning of October, 1893, began to suffer from swelling of the feet and legs. At the beginning of November she consulted her family medical attendant, who noticed puffiness of the face, and on examining her urine diagnosed Bright's disease. Next day there was general oedema all over the body, with severe headache and vomiting. A few days thereafter she had a severe convulsive seizure, and was comatose for several days. After that she gradually recovered. Within two months the oedema had completely disappeared, and she was able to go about. About the second week of January, 1895, she first observed gradually increasing failure of vision, and came under my notice on February 5th, 1894. Her visual acuity was then found to be very defective, being only able to distinguish large objects, such as the hand. On ophthalmoscopic examination both eyes were found to present the appearances of typical albuminuric neuro-retinitis. The discs were slightly swollen, greyish red in colour, and the edges were completely obscured. A group of brilliant white spots arranged in radiate fashion surrounded the macular region in each eye, being most abundant in the right. There was diffuse opacity of the retina, and a few hemorrhages scattered over the fundus, but most abundant at the periphery. The urine was pale in colour, specific gravity 1008, and contained considerable albumen. There was no cardiac hypertrophy or notable elevation of arterial tension.

The patient was put upon strict milk dietary, with mild saline diuretics, which were afterwards replaced by iron and strychnine. There was a very rapid improvement in the patient's visual acuity, and within two months she could read No. 1 of Jaeger's test types. The eyes, however, were easily tired, and she was not allowed to use them for a considerable time for reading or any fine work. There was a gradual diminution of the amount of albumen in the urine, although a slight trace was to be found for about a year thereafter, but since then none has been found. With the gradual disappearance of the albumen there was a gradual disappearance of the neuritis, and of the brilliant white spots surrounding the macula. When the albumen finally disappeared from the urine the discs had resumed their normal appearance, and the only trace of the white spots was a faint mottling observable on close inspection in the perimacular region. The hemorrhages left the only permanent traces of the previous condition, in the shape of a few little pigmented spots chiefly at the periphery.

The patient was shown at a meeting of the Glasgow Medico-Chirurgical Society on February 8th, 1897, almost exactly three years after she had been seen with her albuminuric retinitis. She was in excellent health, completely free from albuminuria during the last two years, and with normal visual acuity. The only traces of the past condition observable in the fundus were the slight perimacular mottling and the few pigmented spots already mentioned.

Great attraction has of late years been drawn to the very unfavourable prognosis as to life in cases of albuminuric retinitis.

In 1888 at the Ophthalmological Society in London a discussion took place on this subject. Dr. Miles Miley, who introduced the discussion, said that out of 45 cases of albuminuric retinitis which he had been able to trace the majority were dead within a year, and only one lived beyond eighteen months. He concluded from his study of these cases "that the prognosis is so bad that eighteen months is an exceptionally long term of life after the changes have been recognised." Dr. E. O. Belt, of Washington, at a meeting of the American Medical Society, Ophthalmological Section, in 1895 gave some interesting statistics. Basing his remarks on an analysis of 419 cases, he found that in hospital practice 85 per cent. died in the first year, and only 6 per cent. lived more than two years. He further remarked that several ophthalmic surgeons of large experience had seen none who survived more than two years. Professor Knies, in his recent work on *Relations of Diseases of the Eye to General Diseases*, says that "life is rarely prolonged longer than one year, at the most two years after the discovery of the retinal affection."

Although my own experience confirms the above statements, yet there are notable exceptions to this gloomy prognosis in albuminuric retinitis, of which the case just recorded forms a brilliant example, the patient being alive and in good health three years after the attack.

Albuminuric retinitis most frequently occurs in chronic interstitial nephritis, and these are the cases where the rapidly fatal termination nearly always justifies the hopeless prognosis. But albuminuric retinitis is met with in all forms of renal disease, even in the acute forms. The cases of recovery are met with in those acute and subacute cases of nephritis where the albuminuria disappears, the retinitis gradually subsiding with the disappearance of the albuminuria. This favourable termination is seen most frequently in the albuminuria of pregnancy, where the albuminuria is generally transitory, disappearing after the birth of the child. The case recorded was probably an acute parenchymatous nephritis. The suddenness and severity of the initial symptoms, the early appearance of general oedema, the severe uræmic symptoms, the convulsions and coma, the rapid im-

provement of the patient, the absence of cardiac hypertrophy, and the subsequent complete disappearance of the albuminuria are all in favour of this view.

This case conveys the important clinical lesson that in albuminuric retinitis the prognosis must largely depend upon the character of the renal affection. If it occurs in the course of a chronic interstitial nephritis, the prognosis is exceedingly grave, and the probability of the patient surviving beyond a couple of years is very slight; but if it occurs in the course of an acute or subacute parenchymatous nephritis, with careful treatment and under favourable hygienic conditions, there is considerable hope both that the patient may recover from the renal condition, and that the retinitis may disappear, leaving the patient with vision but little, and possibly not at all, impaired. Hence in every case of albuminuric retinitis, before expressing any opinion as to prognosis, the great importance of ascertaining by careful consideration of the history and examination of the urine, the character of the renal affection, cannot be too strongly urged.

THE ORIGIN AND DESTINATION OF CERTAIN AFFERENT AND EFFERENT TRACTS IN THE MEDULLA OBLONGATA.*

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[ABSTRACT.]

IN attempting to ascertain the origin and destination of some of the afferent and efferent tracts which exist in the medulla oblongata the lateral region of the medulla was divided or destroyed between the ascending root of the fifth nerve and the inferior olive, the restiform body, Edinger's direct sensory cerebellar tract (tractus nucleo-cerebellaris acustici), and the posterior columns and their nuclei were divided, and Deiters's nucleus was severed from its connections with the medulla. The first of these procedures resulted in degeneration of two efferent direct tracts, which could be traced throughout the whole length of the spinal cord, the one occupying the periphery of the antero-lateral region, and the other an area close to the crossed pyramidal tract, but distinct from it, both direct tracts sending fibres to the anterior horn on the side of the lesion at different levels in their course. Afferent degenerated fibres were found passing from the seat of lesion, some reaching the cerebellum by way of the restiform body on the same side, and some by way of the anterior cerebellar peduncle after passing through the medulla and pons, while others, intimately associated with the fillet, were traced to the region of the anterior corpora quadrigemina. Owing to interruption of internal arciform fibres by the lesion there was degeneration of the opposite interolivary layer and fillet. Similarly fibres passing from the restiform body to the inferior olive were interrupted, and degenerated in consequence.

Division of the restiform body resulted in degeneration of afferent fibres to the cerebellum, and of efferent fibres to the formatio-reticularis and inferior olives. No tract in the spinal cord was found degenerated after this lesion.

Section of the "nucleo-cerebellar tract," formerly known as "Edinger's direct sensory cerebellar tract," resulted in no degenerations other than those met with in injury to Deiters's nucleus which is imbedded in the tract. No afferent fibres degenerated from the nucleus of Deiters to the nucleus globosus in the cerebellum.

Severance of Deiters's nucleus from its connection with the medulla resulted in degeneration of an efferent direct antero-lateral tract throughout the spinal cord, fibres passing from it to the anterior horn of the same side, and a few to that of the opposite side. This tract is probably identical with that met with after the lesion to the lateral region of the medulla, and has been described as having its origin in the cerebellum

* The experiments were conducted in dogs and monkeys. Full details of the procedures and results, together with a review of experimental work by others bearing on the subject, will be published elsewhere.