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Noyes, Henry D. 1832?-1900.  
University College, London. Library Services

### **Publication/Creation**

New York : G. P. Putnam's sons, 1875.

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CASES

70.

OF

DISEASE IN THE ORBIT.


BY

HENRY D. NOYES, M. D.,

Professor of Ophthalmology and Otology in Bellevue Hospital Medical College,  
Surgeon to the New York Eye and Ear Infirmary, etc., etc.



NEW YORK:  
G. P. PUTNAM'S SONS,  
FOURTH AVE. AND 23D ST.  
1875.



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# CASES OF DISEASE IN THE ORBIT.

by HENRY D. NOYES, M. D., Professor of Ophthalmology and Otology in Bellevue Hospital Medical College, Surgeon to the New York Eye and Ear Infirmary, etc., etc.

The following cases are offered for publication because some of them are rare, and others are noteworthy because of special features.

Almost all of them are cases of inflammatory action in various phases, and become interesting because of difficulty in diagnosis or treatment. Tumors in the orbit are not extremely uncommon, and have been purposely omitted from this list, while pains have been taken to introduce cases which strongly resembled orbital tumor in their symptoms, that emphasis may be given to the fact that oftentimes these two classes of cases, during their early history, are closely alike each other.

It is only needful to call to mind the many tissues which fill the orbital cavity, the thinness of its bony walls, the diversified size and form of the cavities adjacent to it, the importance of the eye-ball, and the nearness of the brain, to realize what perplexing questions in diagnosis may arise, and what gravity attaches to the subject of treatment. A perusal of the cases will illustrate the force of this remark. I first offer the cases of simple inflammation in the orbital tissues which did not result in suppuration, as is the usual event, and which for a time seemed like cases of tumor.

*Case 1.—Exophthalmus. Cellutis Orbitæ.* I was asked by Dr. V. W. Jones, of this city, to see, in consultation with him, an infant one week old, born without instrumental aid, or prolonged labor; presented at birth a conspicuous prominence of the left eye. The pupil was natural, and there was in both eyes some conjunctival irritation. The eye stands fifteen mm. from the margin of orbit, and six mm. in advance of the other; movements free; pupil normal; anterior chamber normal; by ophthalmoscope, interior of eye healthy. The nerve has a dark mahogany color; edges clear; no swelling; no growth within the eye-ball. The fornix conjunctive everywhere edematous and vascular; the axis of eye turned downward and outward. The lids during sleep stand about  $\frac{1}{4}$  inch



apart and come together in crying. No bruit to be heard; no pulsation to be heard nor felt; nothing abnormal in surrounding vessels.

A reserved opinion expressed that a tumor might be present in the orbit. In about three weeks the eye-ball returned to its normal place in the orbit; there had been no suppuration nor signs of disease, and the case must therefore be considered one of simple inflammatory œdema of the orbital tissues. The extreme youth of the patient, the absence of known cause, the absence of signs of distress in the part, conspired to make me suspicious that a cancerous growth was making its appearance, and I could only give an undecided opinion, with the advice to do nothing. The result showed that a favorable prognosis might have been given with less reserve than prudence made me willing to do.

*Case 2. — Cellulitis Orbitæ. Exophthalmus.* Master S., aged 11. August 1867. Four weeks before I saw him had pain in right orbital region for twelve hours, and this afterwards succeeded by swelling and redness of the eye, which continued at a maximum for ten days, and then began to subside, but has not disappeared.

There is now exophthalmus to level of brow; the upper and lower lids puffy. Globe moves freely; turns out and upward; has diplopia, and wears a shade to correct it; vision,  $\frac{20}{20}$ .

Ophthalmoscope shows nerve to be hyperæmic; veins turgid and twisted. In the other eye a similar vascular condition, but not so decided. Has a fair look for a city boy; pale and slight built, but active.

Cannot distinctly feel tumor, or see it when lids are widely separated; no pulsation nor thrill; no abnormal state of exterior vessels.

27th: Not so much protrusion; deviation is about  $40^\circ$ . September 21st: protrusion receded nearly to normal position; deviation  $35^\circ$ , viz.: left  $20^\circ$ , base  $135^\circ$ , right  $15^\circ 0'$ , single vision.

October 26th: Able to unite double images, with prism  $8^\circ$  base out; object at six inches = converging power of  $8^\circ$ .

The facts of this case at its onset point to inflammatory action in the orbit; but these indications receded, leaving a permanent deformity in the pushing forward and outward of the eye-ball, without any tenderness of the parts. In this condition I saw the boy and the aspect of the case was that of tumor. For four weeks



eye-ball remained protuberant and double vision existed; then the eye began to retire into the orbit, and ultimately a perfectly normal condition was restored.

The explanation of this case must be that inflammatory exudation pushed the globe forwards, and obtained sufficient density to assume all the physical characteristics of a tumor in its mechanical behavior. To all intents and purposes it became, for the time being, a tumor, but finally yielded to the power of absorption.

I gave the iodide of potassium, and corrected the double vision by suitable prisms.

The above two cases being in young subjects, the conclusion may be perhaps warranted that, in a case of doubt between tumor and inflammation, the balance of probabilities would be in favor of the latter.

*Case 3. — Periostitis Orbitæ. Syphilitic.* R. E. F., woman, æt. 33. Came to New York Eye and Ear Infirmary, February 8, 1873, with the symptoms of severe purulent inflammation of left eye, which began five days before. There is swelling of lids, chemosis and hyperæmia of conjunctiva, considerable puriform secretion, the cornea clear. The presence of patches of eruption on the temple and eyebrow led to the supposition of the existence of secondary syphilis, and to examination of the borders of the orbits to see if there were any trouble there. Patient complained of severe pain around eye and in head, and this was accounted for by the extreme tenderness of the bony edge of the orbit, when the finger was passed over it.

It was noticed that the degree of swelling of the upper lid was out of proportion to the conjunctival secretion. Instead, therefore, of calling the disease conjunctivitis, it was more fitly pronounced periostitis, with conjunctival complications.

Treatment: Three leeches applied to the temple; iodide of potassium, gr.  $\times$  *ter.* in die. Sol argent nitratis, gr.  $\times$  ad.  $\frac{3}{4}$  j., applied to the everted conjunctiva twice daily; cold compresses kept on the eye; patient in bed. The symptoms abated during twelve days, to be renewed again with aggravation of tenderness about temple. Three leeches again ordered, and potassium iodidi increased to forty-five gr. daily. The patient is in feeble health, is thin and anemic, eats but little, and needs anodynes to sleep. On the eighteenth day from the beginning of the attack the same trouble appeared in the other orbit, and showed itself first in swelling of the



lid, and superior conjunctival cul-de-sac, pain, sensitiveness of the orbital rim, and purulent secretion from conjunctiva. Leeches again used, and on the following day pain increased to such severity as to demand hypodermic injection of  $\frac{1}{3}$  gr. morphia, and internal administration of 30 gr. hydrate chloral. For fourteen hours patient was delirious, and the symptoms much aggravated at night. For three days matters grew worse, compelling the above dose of anodyne to be given every six hours, and iodide of potassium was pushed to gr.  $\times$  L. every two hours. Under the pressure iodism appeared, and the salt was omitted for forty-eight hours. There was no sudden abatement of symptoms, but they gradually subsided. An examination of the urine was made, while the high doses of iodide were being exhibited, and with almost negative results.

There were no casts nor blood, nor albumen, and of iodide of potassium there were 2.8 grains to the ounce; specific gravity 1.013, reaction acid.

A remission of active symptoms occurred for a few days, and again delirium and pain appeared.

Patient was taking forty grains of iodide daily, and with it forty grains of bromide pot., and mercurial inunction employed; symptoms of iodism and of mercurialization came on, and the medicine withdrawn. On the completion of a month the attack was at an end, and after two weeks longer patient was discharged. Some haziness overspread the cornea, but all other symptoms of trouble had departed.

There never was any evidence of growing exudation in or around the orbit, nor was there perceptible exophthalmos; the inflammation did not appear to go beyond the state of hyperæmia and serous effusion, while its influence upon the tissues of the eye and upon the brain gave it serious importance. I have no doubt that the delirium, which lasted for several days, was due to extension of the inflammatory action to the meninges of the anterior frontal lobes. The treatment was, in the use of the iodide of potassium somewhat heroic, and the effect obtained was not in proportion to the quantity of the remedy. An embarrassing circumstance was the wretched health of the patient, which forbade energetic treatment by leeches and unfitted her to bear the iodide of potassium. In reflecting upon the management of the case I would suggest the propriety of making an incision into the periosteum at an early stage of the attack by a sharp-pointed bistoury. That is to per-



trate the upper lid above the levator muscle, and push the point back along the roof of the orbit in its middle line, and divide the periosteum by cutting against the bone. I do not see any anatomical objection to such a cut, and think it would relieve some of the pain. No important tissues need to be divided on this line of incision, because it is above and to the outer side of them.

An examination of the patient's general condition revealed undoubted evidence of secondary syphilis, and up to this time no new developments have come to my knowledge.

*Case 4.—Erysipelas of head and face. Cellulitis Orbitæ Loss of one eye. Death.*

Robert F., æt. 28, iron-founder, New York, in April, 1874, was attacked by erysipelas of the scalp, and put himself under care of Dr. Bliss, who after a time called me in consultation. The disease had caused great infiltration of the skin, and had attacked not only the eyelids but the tissues of the orbits. The lids of the right eye could be separated by a pair of elevators, just enough to give a peep of the eye, while the left eye was pushed out of the orbit so as to project beyond the lids. Dr. Bliss had already made a vertical incision through the left upper lid, to relieve the pressure on the globe. The skin of the forehead was livid and purplish; its temperature cold like the cadavre; it scarcely pitted on pressure, and was almost devoid of sensation. It was dotted with small bullæ, and extremely tense.

I picked off a dense crust which covered the left globe, and found the cornea clear and pupil of normal appearance, but the eye sightless; it was very hard and imbedded in chemosis; it projected from the orbit about half an inch, and was absolutely immovable.

Patient was in a torpid state of mind, able but slow to answer questions; pulse small and frequent.

The manifest indication of treatment was to give relief to the extreme tension of the inflamed tissues. I therefore made three incisions through the skin of the forehead, vertically from the root of the hair to the root of the nose, and to the middle of each eyebrow. The skin was hard and resisting, like raw salt pork. It bled very little, and the cut surfaces presented innumerable small foci of pus. The eyelids were deeply incised in a direction parallel to the brows, and in the left orbit, where the ball was extruded, the bistoury was carried deeply in toward the apex, both above the eye and at the outer angle. No fluid of any kind was discharged, nor was much



pain experienced. The tension of the skin and connective tissue was fully relieved, but no pus in fluid form was found. The appearance of the patient's face, after the many severe cuts about the forehead and eyelids, was simply hideous. His general condition demanded the most energetic stimulation and feeding, which was effectually carried out by Dr. Bliss. In the progress of the case, as the patient gradually grew better, the skin assumed a softer condition, and almost immediately after the incisions above described it showed evident signs of relief. The subsequent history was precisely like any other severe case of erysipelas which ends by recovery. The eyeball, which was pushed out of the orbit, could not long withstand the damaging effects of its exposed position, and it underwent suppuration, which began in the cornea. I call attention, however, to the fact that its function was first destroyed by the acute inflammation in the orbital cavity acting upon the optic nerve and deep parts of the eye. This globe finally went into atrophy.

After the patient was able to go out he called upon me for advice regarding the eye which remained to him. This I found was congenitally defective. It was hypermetropic to the degree requiring a glass with the formula  $+ 8$  spherical  $+ 16$  cylindrical, axis  $90^\circ$  for distance, and even when thus aided its vision was only  $\frac{2}{7}$ . This defect was a serious drawback, but in the sequel, it appeared that his health had been so deeply affected by the erysipelas, that he succumbed some weeks afterwards to a moderate attack of bronchitis. The importance of the bold treatment adopted to control the erysipelas was fully demonstrated by the success which followed.

*Case 5.—Acute abscess in orbit, caries, opening into posterior nasal fossa.*

Mrs. R. B., aet. 33, came to the New York Eye and Ear Infirmary in September, 1873. She says that about two months ago she was attacked with severe pain in the right side of the face, and the next day the eyelids swelled, and the globe became prominent. About four weeks after, an abscess pointed at the inner angle of the lower lid below the inner canthus, and was opened, and discharged pus. A continuous discharge has been kept up ever since, and now there is a pouting opening, such as is usual in cases of caries. A probe, properly curved, can be passed backwards and downwards a distance of between three and a half and four inches, and in its progress came in contact with dead bone. The depth and direction



of the track led to an examination of the posterior nares by the rhinoscope, and Dr. Lefferts, who kindly made the examination, found a mass of granulation tissue filling up the posterior aperture of the right nostril. This was evidently the orifice of the fistula. So striking was the appearance that Dr. Lefferts made a water-color drawing of it, which he was good enough to contribute to my notes of the case. The treatment then instituted, consisted in the cleansing of the fistulous track with a syringe three times weekly, by which the stream of water was carried into the throat, and caustic applications to the granulation mass behind the velum palati done by Dr. Lefferts. In connection with this, I several times introduced into the facial orifice of the fistula tents of compressed sponge, by which it was enlarged enough to admit the finger. From time to time scales of dead bone were extruded, and in about three months treatment the sinus was completely closed. The eyeball was entirely restored to its normal appearance, the granulations in the posterior nares disappeared, and the discharge ceased.

#### REMARKS.

An important element in the success of this case was the treatment of the disease in the nasal cavity. Without attention to this it would certainly have been very difficult, if not impossible, to obtain the closure of the sinus at the facial orifice. An aggravated nasal catarrh would certainly have remained and persisted. Fortunately the patient had admirable control of the faucial muscles, and readily permitted the necessary manipulations with the mirror. An advantage connected with this opening into the nostrils was that it facilitated thorough cleansing by the syringe, because the water was not compelled to flow backwards.

The process of dilating the sinus by compressed sponge was evidently of great service in promoting the cure. It gave some pain, the pieces being kept in for twenty-four hours, until they had swollen to their utmost; but after their removal the escape of bits of bone and secretion was easy, and the walls of the abscess more rapidly grew together.

#### *Case 6.—Exophthalmus. Abscess. Fistula of orbit.*

Mrs. F., æt. 55, consulted me in January, 1871. She had been troubled for six months by attacks of swelling of the right upper lid, unattended with pain or secretion, but sometimes so great as to close the eye. The attacks make the eye feel weak



and difficult to use; they happen once in ten or fifteen days. On careful inspection the right eye is found to be protruded from the orbit a distance of six millimetres beyond the fellow eye. Both globes are prominent, and the healthy one stands fourteen millimetres beyond the outer edge of the orbit. There is no tenderness under pressure upon the globe, nor anywhere about the edge of the bone. Examination by the ophthalmoscope discovers nothing in the optic nerve or the eye to throw light on the case. There is no tumor to be felt anywhere about the orbit. Gave iod. potass. gr. v, *ter in die*, and directed a small bag of ice to be applied over the eye, for ten minutes three times daily. Considerable improvement ensued and no attack of swelling took place for a period of four weeks. But during the latter part of March, headache over the right frontal region became quite constant and troublesome. The pain was remarkably regular in its onset at four o'clock in the mornings and would last until eight A. M. A small, prominent and tender spot could now be felt by the finger at the upper inner angle of the orbit. During two weeks this swelling became larger, the lid grew edematous, and the existence of an abscess was hardly doubtful. There was no increase in the protrusion of the globe. There was no fluctuation to be felt about the tumor, and to reach the pus the bistoury was entered to a depth of three-quarters of an inch, with an external incision of half an inch. Upon careful exploration with probe no signs of dead bone could be felt, nor was there ever any evidence of exfoliation. By the evacuation of the matter much relief was experienced, but the distressing headache was still troublesome, and was held in check by increasing the iodide of potassium to ten grains three times daily.

The discharge of pus gradually diminished, but could not be made to cease completely. On the contrary, a sinus remained, giving vent to a watery, purulent fluid, and showed no inclination to heal for eighteen months. During this long period the eyeball receded a little, there was freedom most of the time from headache, and the chief annoyance consisted in the dripping from the fistula, which made the lady unwilling to appear in society, and greatly marred her happiness. It was hoped that in time some fragment of bone would show itself, and on being removed that the fistula would close up.

In February, 1873, more than two years after being first consulted in the case, there was an aggravated return of headache, a greater quantity of pus was discharged, and it was determined to



explore the cavity and find out why it refused to heal. The opening dilated by laminaria and by a small sponge tent, and it was found that a probe after entering in a little distance could be passed through the wall of the orbit into the frontal sinus. The hole in the bony wall was three-quarters of an inch behind the orbital edge; and though doubt was expressed by Dr. Markoe, who saw the case in consultation, as to the penetration of the frontal sinus, I found on examining a series of skulls that the frontal sinus will often be large enough to make this supposition correct. The size of the cavity varies greatly in different subjects, but naturally is greater in advanced life, and Mrs. F. was already beyond middle life. In no other direction could the probe be passed.

Considerable reaction followed this exploration, and after it had subsided injections of warm water were made daily, and on each occasion about one and half drachms of pus brought out. The tr. myrrhæ, diluted with six parts of water, was afterwards injected. A diminution of secretion occurred, and in a few weeks an injection of chromic acid, diluted so as to be of a very light color, was made, and followed in a few days by an entire cessation of discharge.

In May, 1873, track continued open, although no matter escaped. It was cauterized a few times with nitrate of silver. It was also found on further exploration to extend downwards and inwards toward the nasal cavity, but no evidence could be found of direct communication with the nose. On examining the right nostril a polypus was found in the top of the middle meatus.

There was no obstruction in breathing through this side, no sense of fulness, and no catarrhal secretion. Nothing was done with the polypoid growth. The patient went into the country.

During the next few months the fistula contracted and, finally, completely closed.

I regard this as a case of chronic orbital periostitis, which developed with an abscess, and the great depth of the abscess prevented the sufficient escape of the secretion. Hence an invasion of the surrounding tissues took place; an erosion of the thin bony walls on the one hand into the frontal sinus, on the other side into the ethmoid cells. When thorough cleansing by a suitable fine tube and syringe was made, the secretion soon began to diminish, and ceased under the alterative effect of astringents. The polypoid growth in the nose was probably only a secondary effect of the abscess, and indicated the site in the nasal cavity at



which the pus, if left to continue its burrowing, would have found an opening.

The process of syringing was performed by a fine silver tube, intended for the lachrymo-nasal duct, to which, by rubber tubing, a two-ounce hard rubber syringe could be accurately fitted.

*Case 7. — Thrombosis of Sinuses at Base of Skull, simulating Aneurism in the Orbit.*

Mrs. B., æt. 35, widow, New York, September 30th, 1873. Last December patient had a fall down stairs; descending first to a platform, where she fell without stumbling, so far as she can remember, and was then unconscious; remembers going down a few steps, with muff and bundle, etc., and in act of turning around to speak to some one. When, after two days, she gained her senses, the left side of her face was bruised and swollen; eyeball prominent, and mouth drawn to right side. Was sick in bed three days, then found that she could not close left eyelid; mouth crooked; does not think that globe protruded, but lids were swollen; had no vomiting. At time of injury nose bled profusely; bled again daily, two days by turns; had no running or bleeding from ear; was picked up in five minutes; had power of arm and leg. After three days, able to walk about room and eat well. In ten weeks went home. For two weeks more found memory impaired. From February to about June, no other symptoms than paralysis of facial (left) nerve, including orbicularis. About June 1st, noticed the veins of angle of eye and temple began to enlarge. Recollects a beating sound from the earliest time after the injury; does not seem now any louder than at first. Had no dizziness; never had headache; sleeps well.

Find partial paralysis of left facial, lids down to  $\frac{1}{4}$  inch, pupil natural; inner angular vein, veins of upper lid and temporal, are all varicose and full. Feel a thrill by hand over eyeball.

Globe projects about  $\frac{1}{2}$  inch.

Hear a bruit with great distinctness over globe; not over right globe, but it can be heard in right and left temple and over both nostrils. She will not bear pressure enough on carotids to stop the pulse and bruit.

Ophthalmoscope shows arteries to be small, veins large, full, and not very tortuous. Slight pressure causes venous pulse. Arterial pulse uncertain.

Left membrana tympani whitish and opaque, no sign of scar, but



looks like chronic catarrhal inflammation. Has not had any more bleeding since the injury. Regular in menses. Globe moves easily; no diplopia; suffusions of globe, etc.

May 12, 1874, patient came to Infirmary (Dr. Eno). The exophthalmus remains about the same; no diplopia, no headache, no paralysis; vision  $\frac{20}{80}$ . Ophthalmoscope shows veins full; arteries rather small; pressure easily stops veins and arteries. The vessels on this side of forehead, cheek, temple, and lids decidedly full and varicose. Thrill heard all over both sides of head and down upon neck. General condition fair.

The want of increase in symptoms and the facts of Bowman's case (Ophthalmic Hospital Reports, 1859-60, vol. ii. p. 6) lead me to renounce the diagnosis of aneurism in favor of thrombosis of the sinuses at the base of the skull, and deep jugular vein, especially of the cavernous sinus. To make the matter clear I insert an abstract of Mr. Bowman's case as follows: A woman, aged forty, of irregular, dissipated habits, was admitted, February 19, 1858, into Kings College Hospital, under the care of Mr. Bowman, with symptoms supposed to depend on orbital aneurism. Five months previous to patient being seen she received a blow on left side of head. Had pain, which was quite severe, for two weeks; then it gradually subsided, and was followed by noises like a working steam engine, which could by her husband three weeks after accident. Four and a half months after the blow the left eye began to protrude, and the subjoined memorandum was made on admission into Kings College Hospital. General fulness of the left orbital region, with prominence of the eye, which is congested. The pupil dilated but active. Sees distant objects perfectly, but is unable to read. The angular vein and one over the outer edge of the orbit are dilated. There is an abrupt depression in the lower border of the orbit at the articulation between the malar and upper maxillary bones.

A loud, sibilant bruit can be heard extensively over the left side of the head, but is most intense above and in front of the ear. This sound is synchronous with the beating of the heart.

A similar bruit is heard along the course of the great cervical vessels, as far down as the common carotid artery. The fingers being placed on the left eye, when the lids are closed, pulsation is plainly felt, and the fingers are seen to rise and fall with it; a loud bruit is also heard when the stethoscope is placed on the front of the globe. Head symptoms, as giddiness and loss of memory, have



never been present. The irregularity of the lower border of the orbit seems to have resulted from a blow received three months after the first injury.

Diagnosis orbital aneurism: Left common carotid artery tied by Mr. Bowman. Pulsation and bruit at once arrested. Next day great throbbing on the right side of her head, and on left noises like the beating of a distant drum. Eye not so prominent and less congested.

Eight days after operation bruit heard over left globe and on left forehead; just above left ear a continuous musical note of high pitch, at each pulse increasing. On the twelfth day secondary hemorrhage took place, and re-occurred several times, until patient died on the eighteenth day after the performance of operation.

Post mortem. No tumor, neither aneurismal or erectile, in the orbit, nor sign of fracture.

Meningitis with exudation of lymph at base of brain and left median fossa. Phlebitis with thrombosis of cavernous, transverse, circular, and petrosal sinuses of left side of cranium.

Mr. Hulke, who reports the case, comments as follows: "The internal carotid artery may have been partially compressed by the swollen walls of the cavernous sinus against the side of the body of the sphenoid bone, giving rise to the bruit, which would have a good conducting medium in the cranial bones. The plugging of the trunk of the ophthalmic vein, where it joins the cavernous sinus, by obstructing the return of blood from the orbit, accounts for the protrusion of the eyeball, and perhaps also for the pulsation which was felt when the fingers were laid on it; because each diastole of the ophthalmic artery must have been attended by a general momentary increase of the whole quantity of blood in the orbit, because its exit through the ophthalmic vein was cut off, and the resisting bony walls of the orbit could permit a distention in front only. The healthy state of the internal jugular vein precludes the idea that the pathological changes in the cranial sinuses commenced subsequently to the deligation of the common carotid.

*Case 8.—Traumatic Amaurosis.*

P. R., act., 32, laborer, came to the New York Eye and Ear Infirmary on April 1, 1874. He was a large man, about six feet four inches high, and weighed about two hundred pounds. A week before coming he had been thrown from his truck, and struck the right side of his head on the pavement. The blow was upon the



temple, and quite severe, because of the suddenness of his fall as the wagon wheel plunged into a deep hole, which in the evening he did not notice, and also because of his great weight.

He was not stunned, but had violent pain in the head. He noticed almost immediately that the right eye was wholly blind. Within two days he applied to the out-door-poor department of Bellevue Hospital, and was examined by Dr. Bacon. There was some swelling of the lids, no apparent injury of the eye, and on examining the interior of the eye by the ophthalmoscope, nothing abnormal could be seen. The media membranes and optic nerve looked healthy; yet the man asserted that with the right eye he could see absolutely nothing, not even light.

On the seventh day after the hurt, Dr. Bacon brought the man to me, and I could for the most part confirm the result of his examination. The optic nerve was not in a perfectly normal state, but showed some capillary hyperæmia and haziness of substance, but the large vessels were natural. Examinations were made as to the truth of the patient's statement about his one-eyed blindness, and his answer to the various tests by prisms, and otherwise, were always consistent.

He also complained of trouble in the opposite, the left, ear. On inspection, a small laceration was found in the membrana tympani.

In about two weeks there occurred some loss of sight in the other eye—namely,  $V = \frac{20}{40}$ , whereas it had been normal. In this, the ophthalmoscope discovered commencing inflammation of the optic nerve. The artificial leech was applied, and the patient kept for two days in the dark. After the 20th, he ceased attending, and nothing has been since heard about him. Probably the neuritis optica of the left eye did not advance far. Before the patient ceased his visits the optic nerve of the right eye took on the ordinary appearances of advanced white atrophy.

*Case 9.—Traumatic Amaurosis.*

Mr. A. J. T., aet. 23, New York, came to me, October 8, 1874. When a boy, the right eye damaged by penetration of a bit of stone; a capsular cataract, adherent and partly detached iris were produced. In April, 1874, he attempted to cross a railroad bridge upon a foot-path a single plank wide, mounted upon a velocipede. He fell from a height of about twenty-four feet, and struck his head on the shore of the river. He was made unconscious, and



received a wound over and parallel to the brow, two inches long. There was bleeding from the nose, none from the ear or mouth. The face and head swelled badly; there was some numbness along the infraorbital nerve, and pain along the supra orbital.

There was immediate and total loss of sight. The eye examined by Dr. Scott, of Cleveland, who made the diagnosis of hemorrhage into the nerve sheath. The principal basis of the opinion was the smallness of the vessels at the ocular end of the nerve. I am not inclined to deny that there may have been some intra vaginal hemorrhage, but I attribute the sudden and complete blindness to the direct shock which the optic nerve sustained in the foramen opticum. The crushing force disintegrating many of the nerve fibres, and paralyzing all of them. Subsequent to the injury, the nerve underwent inflammation, and the appearances presented to my inspection were simply those of atrophy.

The other eye operated on first by iridectomy, and three weeks afterwards by removal of piece of capsule. He obtained vision with convex  $2\frac{1}{2}$ , which enabled him to read Snellen  $4\frac{1}{2}$  at 10 inches, with  $+ 3\frac{1}{2}$  V =  $\frac{20}{200}$ .

#### REMARKS.

The two cases above reported cannot claim more than a hypothetical diagnosis. But to this point I would call attention. In the case of P. R., who was examined by Dr. Bacon, a competent observer, within two days of the time of injury, the condition of the optic nerve was to appearance so healthy as to greatly puzzle him for an explanation of the total loss of sight. This fact precludes any supposition of hemorrhage into the nerve sheath, because in this event the circulation in the optic disc would have been interfered with, and the papilla itself likely to be swollen. So, too, occlusion of either veins or arteries by a laceration of their coats cannot be supposed. There remains nothing but the direct effect of the blow on the nerve tissues. This idea has been embodied in the diagnosis which, in such cases, has sometimes been made, viz.: concussion of the retina. The objections to this hypothesis are that it is almost inconceivable that such a shock could be communicated to the eyeball as to paralyze the retina without exhibiting some sign of violence in the interior of the globe, such as rupture of retinal vessels, or what we often see, laceration of the choroid. The second objection to this theory is that if one eye thus



suffers there can be no reason why the other does not suffer in the same way, because it must receive precisely the same degree of violence.

My own explanation is that the damage is inflicted at the foramen opticum, where the nerve passes from the cavity of the skull to the orbit. The mechanism is the transmission of force along the dense outer wall of the orbit, so as to concuss the nerve trunk against the sharp edges of the foramen, just as if it were struck with the back of a heavy knife blade. As the force meets the cellular and laminated structure of the ethmoid it is so diffused as not to inflict the same shock upon the other optic nerve, but may not leave it entirely unharmed.

The other nerve may entirely escape injury, or in it a slower inflammatory process may be set up, as in the first of these two cases. By reference to the skull it will be noticed that if a blow be struck upon the external angular process of the right frontal bone, where it joins the malar bone, the direct line of transmission is along the outer wall and roof of the orbit, meeting first the large foramen lacerum anterius or sphenoidal fissure, and next the foramen opticum. Next in order is the large sphenoidal sinus, which in connection with the cells of the ethmoid, is ample to dissipate the force and protect the left foramen opticum and its nerve. But in the same line thus traced, comes the petrous portion of the left temporal bone, and as it takes shock there can be no wonder that some harm should be done to the ear. This occurred in the case of P. R., in the linear rent of the membrana tympani. In brief, the action of the blow supposed, is obliquely across the base of the skull, from the right temporo-frontal region to the left ear, and from its mischief the parts around the apex of the left orbit are sufficiently protected by the hollows in the bone.

I think a satisfactory explanation is thus given of the remarkable facts of these two cases, namely, sudden and total loss of sight in the eye, on the side where the blow was given, and the almost entire absence of ophthalmoscopic symptoms to explain it, while the opposite eye sustained little injury.

*Case 10.—Abscess beneath the Dura Mater relieved by trephining. Recovery.*

In October, 1867, I was desired to see John D—y, aged twenty-two, living in Williamsburg, suffering from a serious affection of the head.



This young man had been an inmate of the New York Hospital in 1857, when I was one of the resident surgeons. He was brought there on account of a compound fracture of the skull produced by being thrown from a street car. The os occipitis was fractured and depressed, and the os frontis was also fractured. There were signs of compression of the brain, and some of the depressed bone at the back of the skull was lifted into place by Dr. T. M. Markoe. It was not deemed needful to interfere with the injuries about the forehead. The patient after some months recovered and went home.

I did not see him again until August, 1867, when he came to my office to tell me of the severe headaches to which at times he was liable. He showed me a pouting orifice in the skin just below the inner end of the right eye-brow, by the side of the root of the nose. This sometimes gave exit to matter and sometimes was closed. When stopped, he was liable to the violent headaches of which he complained. He admitted that his life had been very irregular, and that a "spree" was not infrequent. I cautioned him against the danger to which such conduct exposed him, in view of the fact that there was probably some disease of the bone not far from the fistula, but I did not probe or specially examine that part.

It was three months afterward that I was summoned to see him and found that grave cerebral symptoms had set in. There had been an intermitting escape of pus from the fistula, which was close to the pulley of the superior oblique muscle, or it would flow from the nostril, but the opening was now shut. On the 10th of October he was seized with convulsions, and had twenty or more during twenty-four hours; pulse, seventy; foul tongue; no vomiting; intelligence dull, while usually his mind was quick; severe and fixed pain in forehead. When I saw him on 14th his pulse was eighty-four, hands and head very hot, had pain over the right frontal region, was in a stupid mental state, but would dimly recognize persons; paralysis of motion of left side of face, arm, and leg, and partial paralysis of sensation. No strabismus, proper command of eyelids, pupils equal and natural. Examined the fundus oculi by ophthalmoscope; could see no signs of stasis in the vessels of the papilla.

The paralysis occurred the same day, and the mental condition had been growing steadily worse, although complete coma had not yet arrived.



y combining the previous history of the patient with his present condition I arrived at the diagnosis that there was an abscess in some part of the anterior region of the brain. Drs. Palmer and Nichols, who had been in attendance, concurred in this opinion, in the necessity of finding vent for the matter as speedily as possible.

It was now late in the afternoon, and we felt compelled to proceed at once to the operation of trephining, in hope of finding the pus. We got the patient on the floor, two assistants holding his head steady with their hands. I made a vertical incision from the root of the nose to the outer edge of the hair, and a transverse cut just above the eyebrows, one inch long, crossing it, then dissected up the flaps and exposed extensively the surface of the bone. It was much depressed; the periosteum quite thick; at the supra-orbital foramen of the right side there was a deep notch, into which I could bury the tip of my finger. After denuding the bone the pin of a small trephine was applied to a point two-eighths of an inch above the supra-orbital foramen, and to the right of the median line, and the disc of bone was removed; the dura mater felt elastic and fluctuating on the temporal side of the opening, and resistant on the side toward the median line.

With the point of a bistoury I then punctured the membrane and opened a small vessel, which bled smartly; attempted to stop it, but failed, and then pushed the point of the knife through the dura mater. I was delighted to see a drop of pus ooze out, and after enlarging the cut about three drachms of creamy pus slowly flowed out. Put in my forefinger, and pressed it up to the second joint under the roof of the orbit, and along a fissure at its upper and outer angle. During the dissection of the skin the patient made considerable efforts at resistance; as the blood flowed rather copiously from the dura mater his movements became more active, and when the pus had flowed out, his intelligence brightened up in a decided degree; his utterances were more rapid and language correct; eyes rolled more quickly, and the left side of the body began to recover power. He could make a firm grasp with the hand, and move the leg. The wound was syringed out with warm water; no ligatures were used; the extremities of the cuts united with sutures; the parts about the bony orifice left free. Cold water dressing. When I took my leave, about an hour after the pus was evacuated, the patient shook hands with me, and with animation inquired why I was going.



My next visit to the patient was four days afterwards, and learned from Dr. Palmer that his pulse rose to one hundred twenty the night following the operation, and since has been between seventy and eighty. He is now in full possession of sensibility and muscular power; is mildly and sometimes violently delirious; has pain in the forehead, and natural sensation over whole forehead, and natural sensation over the whole scalp; peevish and cross; sleeps by aid of a quarter grain codeia; has nausea; tongue moist and furred; bowels and bladder act naturally; pulse 74. Bromide potassium half a drachm *ter. in die.*

The delirium continued a few days, and then the bodily and mental functions became natural.

The wound granulated well, and by November 2d a mass of purulent material had risen up from the hole in the bone, beyond the level of surrounding skin.

On 24th of November, forty days after the operation, no more pus flowed from the cavity of the cranium; is not now irritable temper, although always highly nervous. His memory now recollects vividly the incidents of his stay in the New York Hospital, years ago, but cannot clearly recall the events of the past months. Appetite voracious. Goes to the country to-morrow.

July 18, 1868. From the seat of the wound made by trephining there developed, in the space of four weeks, a fungus cerebri, which attained considerable size, projecting half an inch from skull, and expanding one and a half inches in diameter. He was seen in consultation by several prominent surgeons of the city, amongst others Dr. Van Buren. The fungus cerebri were cut off and freely cauterized with nit. argent.; but it re-appeared, and was finally removed by a species of truss or pad, contrived for it by a doctor of Bridgeport, Conn. Under the continued pressure caused by the pad it disappeared. I saw patient subsequently, and he suffered from no head symptoms, headache, etc., and had gained flesh.

Over the wound there was a dense cicatrix of fibrous tissue, permitting pulsation of brain to be felt.