reduced illumination, while I could just discern "brilliant" he could only read "pearl" type. As I do not possess a proper photometric apparatus I could not determine whether his hemeralopia showed the peculiar features which are said to be characteristic of "miner's nystagmus."

The above case well illustrates the care with which patients' statements about themselves should be accepted. In this case the "dimness of sight" resolved itself on investigation into a complaint that objects seemed to dance up and down, and of some slight form of hemeralopia. I am convinced that many cases of asthenopia, which are not completely relieved by appropriate correcting glasses, would be found on careful investigation to be due to some form of muscular asthenopia, for example, heterophoria, or perhaps a nystagmus due to fatigue of the ocular rotators.

TRAUMATIC LESION OF THE PONS VAROLII.*

By J. E. GRAHAM, M.D.

THE following case, which came under my observation five years ago, I thought of sufficient interest to present to this Association.

History.—The history was first taken in 1892. It was partly obtained from the parents, who had to trust to memory. A. L., aged 10 years. Nothing of note in the family history. The patient was perfectly well until 18 months old, when, while playing on a pile of wood about 2 feet high, he fell, and a slender jagged end of a spruce stick about 2 feet long entered the mouth and penetrated the soft palate near its junction with the hard palate. In the fall the stick was broken at the line of the teeth, and was so firmly imbedded in the tissue that it had to be moved from side to side, and much force was required to draw it out. The sliver measured between 3 and 4 inches. Profuse hæmorrhage followed. The accident occurred at 5 P.M., and the patient cried until 11 P.M., when vomiting of clotted blood commenced. Immediately after the vomiting, convulsions set in lasting about two hours, during which the child struggled violently. A second series of convulsions similar to the first, but shorter in duration, occurred on the next day. On the third night after the accident he had a third convulsive attack, and during the afternoon a fourth. The latter was followed by pain, which continued until morning, when the paralysis of the right arm and leg was noticed. The face of the opposite side was affected. The left eye was turned slightly inwards, and the pupil was contracted. He swallowed liquids with difficulty; no solid food was given. He vomited occasionally for two weeks, and remained in bed for seven months. Convulsions occurred frequently, which were epileptiform in character. Since the recovery of his strength he has had many convulsions—at first several in a day, but latterly they have become less frequent. A series would often last seven or eight hours. Latterly they have occupied ten to fifteen minutes, and the last one only five minutes. For the last five years they have occurred at night. They have been more frequent during the fall of each year. Constipation seems to precede the convulsions. His mind is always clear, but he is not so bright as other boys. The affected side is always colder than the other, and the right hand, which is rigid during the day, quite flaccid at night.

Present Condition.—The patient is a strong healthy-looking boy. Integument: Some small circular spots of psoriasis are found on the right leg and left arm. The teeth are a little irregular, otherwise normal. A scar, half an inch long, is seen in the soft palate running forward and outward from the median line, a quarter of an inch behind the hard palate. The following measurements of the two sides were made:

	Right.	Left.
Chest	17½	14
Humerus (length)	8½	9½
Radius (length)	7	7½
Median humeral circumference of arm	6½	7
Circumference 2 inches below elbow	6½	7½
Circumference of wrist	5	5½
Thigh (6 inches above knee)	13	14
Calf	9½	10
Ankle	6½	7

The face is drawn slightly to the left side. No motion of the muscles of the fore right arm is possible, except slight additional flexion of the fingers, which are always considerably flexed, and cannot be easily extended. Motion of all the muscles of the humeral region can be made with some awkwardness. In the lower extremity all the muscles seem capable of motion, but the foot is capable of only about half the normal flexion on the leg, due apparently to some contraction of the muscles of the calf. Patient has an awkward limp, which seems due in part to the loss of motion in the ankle-joint, and in part to lessened general power over the muscles of the joint.

The following notes were taken by Dr. Robbin, of the Royal Victoria Hospital, September 1st, 1897:—

Present Condition.—Patient is a fairly well-nourished young man of 15, of rather above average stature. Intelligence is but fair. Facial expression is dull and heavy, and mental condition corresponds to this to some extent. Face is flushed, and has a slightly bluish tint. Fingernails are cyanosed considerably; the extremities are cold; finger-nails of the right hand are rough and harsh. Pupils are equal, and react well to light and accommodation. There is no paresis of the eyeballs, and no nystagmus. There is marked atrophy of the right upper extremity, and marked contracture of the flexors of elbow, wrist, and fingers. This con-

tracture is most marked at the wrist, which is flexed to such an extent that the metacarpal bones make an angle of about 60° with the radius and ulna. There is some deformity of the carpus as a result of this. There is also some atrophy of the right lower extremity, but this is less marked. There is slight contracture of the right calf muscles, so that complete flexion of the ankle is not possible. On the flexor surface of hands and feet, and to a less extent on the flexor surfaces elsewhere, are seen a number of small scaly patches of an eruption somewhat resembling psoriasis. Pulse 64. Respirations 18. Temperature 98.5.

Glandular System.—Both epitrochlears are palpable, the right being slightly enlarged. Glands in left axilla and left groin are very moderately enlarged. In all cases these glands are firm and freely movable.

Locomotor System.—Skin is rather dry; general nutrition is fairly good; muscles on left side are of normal size and tone. On the right side there is some atrophy, but muscular tone is not increased, though contracture is present as already described.

Dimensions of Limbs.

	Right.	Left.
Calf	11¼ inches	12½ inches
Mid-thigh	14½ "	16½ "
Forearm (maximum)	7½ "	9½ "
Middle upper arm	7½ "	9½ "

Nervous System.—Intelligence is perhaps rather below the average; mentally the patient is rather dull, though somewhat neurotic. He sleeps well.

Gait.—In walking patient tends to drag the right toe to the ground. **Voluntary Power.**—On left side this is normal; on the right side there is but slight weakness in the lower extremity. Weakness is marked in the right arm. There is a slight paresis about the right angle of the mouth. Right half of occiput frontalis appears at times to contract less readily than opposite half. There are at times distinct spasmodic contractions of the muscle of the left side of the face, and if there is any difference the electro-instability to the faradic current is also more marked on the left side. Co-ordination is poor in the right upper extremity, and the muscular sense impaired.

Sensation is normal save in the right upper extremity. On both flexor and extensor surfaces of the right forearm and hand sensation is rather dulled, both to touch, pain, and temperature. Patient is slower in recognising touch and temperature on this side.

Reflexes.—Superficial reflexes seem normal. Deep reflexes in both upper and lower right extremities are increased, and ankle clonus is present on the right side. Clonus of the right quadriceps femoris can be induced by suddenly drawing the patella downward, and spontaneous clonic movements of the right quadriceps which last for some time. These are not constant, but recur frequently. Organic reflexes normal.

Atrophy.—There is slight atrophy of the muscles of the right upper extremity, more marked in the right arm. There is also contracture, as already mentioned. There is no spastic condition present. The small muscles of the hand do not appear to be particularly involved, but the pectorales are decidedly wasted, and there is perhaps slight atrophy of the scapular muscles. No tremor or athetoid movements are noticed in the hand.

Electrical Reactions: Faradism.—There is no diminution in the reaction of the paralysed muscles to faradism. If the reaction is at all changed, the paralysed arm reacts more readily than the sound arm.

Circulatory System.—Normal, save for the slight cyanosis already remarked on.

Respiratory System.—Normal.

Digestive System.—Tongue large and flabby, clean; papillæ are large. The organ is fissured. Appetite is good. There are no symptoms of gastric derangement. Bowels regular.

Abdomen is negative to physical examination.

Urine.—Clear straw, acid, 1000, no albumen, no sugar, urea 1.1 per cent., no bile, microscopically negative.

Special Senses.—Hearing is good; taste normal to bitter, sweet, sour, and salt.

Smell.—No definite abnormality, though patient appears unfamiliar with several of the substances generally used to test smell.

Speech is slow and drawing, and rather indistinct, many words being slurred over.

Since the meeting of the Association a careful examination of the eyes was made by Dr. J. McCallum, whose report is here given:

"V.R. ½, no Hm.; L. ½, no Hm. Pupils equal, 3½ mm. in diameter, active to light, consensually and convergence. When investigating the hemiopic pupillary reflex I was unable to satisfy myself that the pupil remained immobile when light was thrown upon the blind side. The difficulty of concentrating light upon the blind area, and that alone, is apparent. Temporal side of right disc slightly pale, no central scotoma. The annexed charts of the field of vision reveal a right homonymous hemianopsia which is absolute. The boundary line between the normal and the obliterated halves passes around the fixation point and is oblique. The half fields which are preserved show contraction for white, red, and green, although visual activity and colour sense are still normal."

There is marked atrophy of the muscles of the right side of the face, the palpebral fissure is smaller than the left. Movements of the eyeballs quite normal. Paralysis of the muscles of the lower portion of the right side of the face. The muscles of the right eye and the right side of forehead are slightly affected. A distinct spasm is occasionally noticed on movement of the muscles connected with the left corner of the mouth, and the left orbicularis.

The electrical reactions are nearly the same on both sides. The muscles of the left side respond a little more readily than those of the right, giving the impression that the former are hypertrophied.

* Read in the Section of Medicine at the Annual Meeting of the British Medical Association, held in Montreal, in 1897.

REMARKS.

1. The symptoms now present indicate a distinct lesion in the motor tract on the left side existing somewhere above the crossing of the facial nerves in the pons Varolii.
2. A lesion in the course of the fibres of the optic nerve on the left side above the nucleus.
3. The spasmodic character of the movements of the face on the left side which was much more marked five years ago than at present, would indicate an irritating lesion of the pons affecting the fibres of the facial on the left side after the latter had crossed over.

The lesion producing the hemiplegia must have been caused by either a hæmorrhage or an inflammation. It was not the immediate result of the accident. If from hæmorrhage, the seat of the lesion would probably be the anterior portion of the pons or the extravasation might be subdural in character, producing pressure on the leg, arm and face centre in the cortex. This would account for the number and

severity of the convulsions. If the lesion resulted from inflammation, it is still more probable that the seat was in the pons Varolii. The inflammation might have extended so as to effect the optic tract above the corpora quadrigemina. The affection of both sides of the face, the temporary paralysis of the abducens on the left side and the contraction of the pupils at the time of the accident all point to the pons Varolii as one of the parts injured.

The present condition of the right arm and leg is no doubt due to a descending degeneration of the motor tract.

The writer has found that in driving a sharp-pointed steel instrument through the base of the skull following as far as possible the course of the piece of wood mentioned, that the point entered the cavity of the cranium beneath the anterior portion of the pons Varolii.

A hæmorrhage in the internal capsule or in the corona radiata, while it would explain the hemiplegia, would not account for the present condition of the eyes, nor would it account for many of the signs noticed after the accident.

It is in my opinion most probable that a meningo-encephalitis followed as a result of the accident, and that in this process the pons and the left cerebral hemisphere together with the membranes were to a greater or less degree affected. The present condition of the patient is not unlike that of many who, from various causes, have suffered from meningo-encephalitis in early infancy.

A CASE OF TUMOUR OF THE PONS VAROLII.

By HENRY HANDFORD, M.D., M.R.C.P.LOND.,

Physician to the General Hospital, Nottingham.

THE patient, a boy, aged 10, was bright and intelligent until about a year ago, when he began to be dull, and his speech gradually became thick. About the same time an internal squint of the right eye, and paralysis of the right side of the face developed. He has had discharges from both ears at intervals ever since infancy. At the present time a perforation of the right tympanum can be seen, but the discharge is very scanty, and the ear disease seems quiescent.

Seven weeks ago he began to stumble while walking. He vomited, and complained of pain over the eyes. The vomiting continued daily for three weeks, until he was admitted into the General Hospital. It was found that he had a marked staggering gait, with a tendency to fall forwards and to the left, increased knee-jerks on both sides, paralysis of the sixth and seventh nerves on the right side, and advanced optic neuritis, with abundant exudation of lymph and hæmorrhages in both retinæ. The question arose how far the ear disease could be the cause of his trouble. It did not seem likely that the facial paralysis was due to the ear affection, because the latter would not explain the paralysis of the sixth nerve, nor the increased knee jerks, nor, in the absence of jugular thrombosis or cerebral abscess, the extreme degree of optic neuritis. The staggering gait, mental hebetude, and the vomiting pointed to cerebral tumour of some kind. The paralysis of the sixth and seventh nerves without any other motor or sensory loss suggested the base as the site. It was at first a little difficult to exclude cerebellar abscess, but the following circumstances pointed against that diagnosis, and it was decided not to operate: The long duration of the paralysis (a year); the absence of pyrexia or any history of rigors; and the extreme degree and rapid progress of the optic neuritis. And, further, in my experience a cerebral abscess is either quite quiescent or steadily progressive, but does not run the irregular course shown in this patient. He rapidly improved to a considerable extent; the vomiting ceased, and he ran about the ward fairly well, so that his friends took him home after about ten days.

On March 6th, 1898, he was readmitted under my care. The vomiting had returned, and some weakness of the left arm had developed. The pupils were irregular, otherwise he remained much the same. He was again put upon small doses of iodide and bromide of potassium, and improved considerably until March 17th, when the vomiting returned, he began to be drowsy, and there was manifest weakness of the left leg, with ankle clonus. He very gradually became worse, and died on April 18th. At the necropsy a tumour as big as