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TREPHINING FOR BASAL HÆMORRHAGE IN A WOMAN AT THE POINT OF DEATH.

Trephining for Basal Hæmorrhage in a Woman at the point of Death (Recovery).[1] By Andrew Smart, M.D., F.R.C.P.Ed.

The woman, æt. 46, was brought by the police, on 22nd June 1890, to Ward 6 of the Royal Infirmary of Edinburgh. She was at the time conscious, and answered questions fairly well. There was a bruise on the right side of the head, near the parietal eminence, where she had received a blow. The face was drawn to the right, but without ptosis. There was no ocular deviation. The pupils were medium in size, nearly equal, and reacted fairly to light, but there was left lateral homonymous hemianopsia. She could not raise the left arm, nor grasp with the left hand, the left forearm remaining flexed, and the fingers curving upon the palm. The thigh and leg movements were defective in a less degree, and the sensibility of both arm and leg, as also of the whole of the left side, was irregular and deficient. Speech was somewhat slurring, but not aphasic.

Some hours after admission coma set in, and some hours later Cheyne-Stokes breathing supervened, and soon became so grave as to threaten life. At my request Professor Chiene trephined, first at the place where the blow had been received, and a second time further forward and a little lower. There was free hæmorrhage from the membranes, but no discoverable cause was found within reach of the director or finger to account for the symptoms. This result corroborated my diagnosis of a right basal lesion, as determined by the existence of a left lateral homonymous hemianopsia.

The breathing, which was characterised before the operation

[1] This case, as establishing a new departure in cranial surgery, was referred to by Professor Chiene, in his Address on Surgery, delivered at the Annual Meeting of the British Medical Association, held at Bournemouth in 1891.

by lengthened intermissions and well-nigh suspended, had become almost normal before the operation was completed, and thereafter continued to improve. This effect was especially noticeable after incising the dura, which was immediately followed by cerebral hernia, thereby giving relief to the cerebral pressure and tension. The patient, a few hours after the operation, had regained consciousness, and continued, as regards her intelligence, to improve until the month of August, when she left the hospital in complete possession of

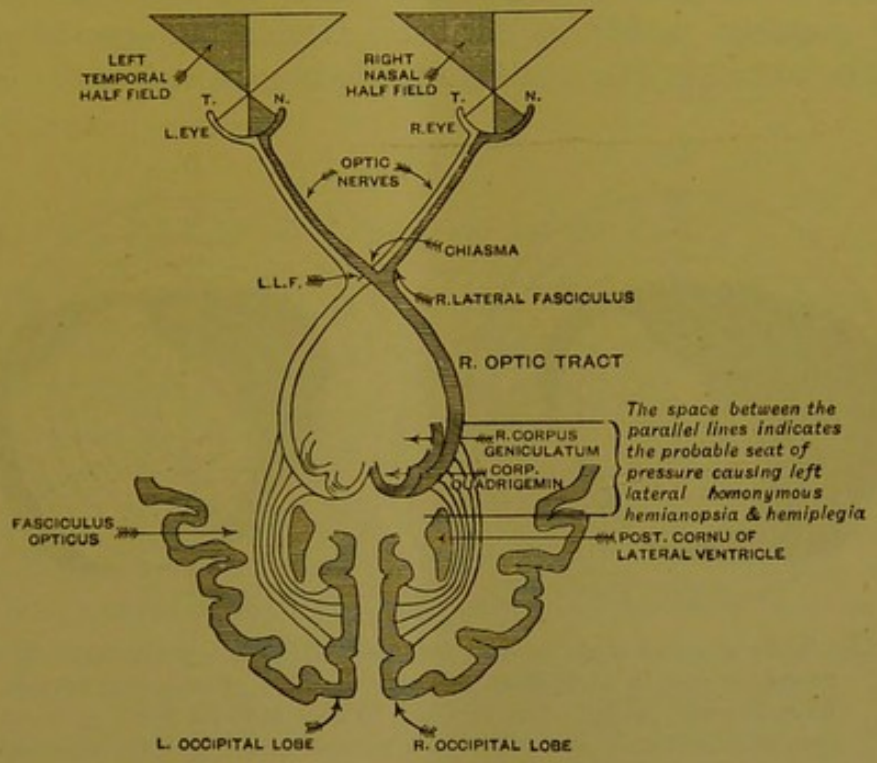


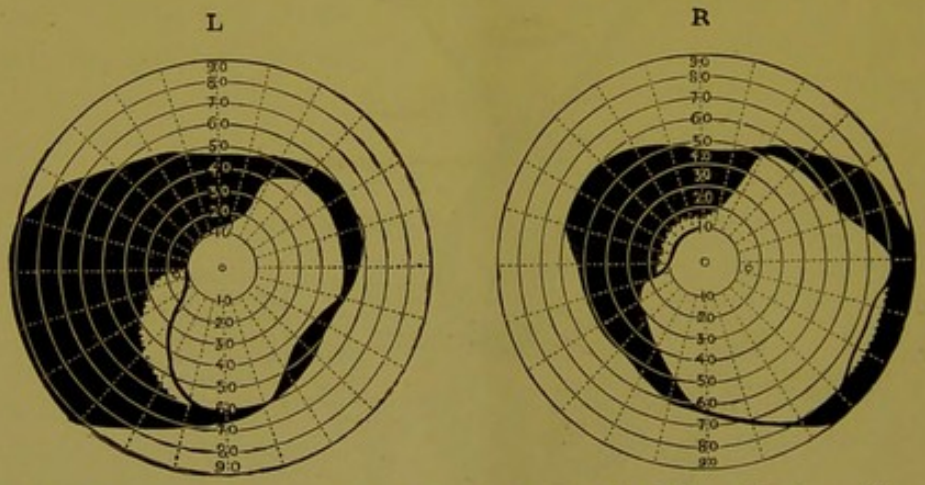
Diagram showing the course of the visual paths from the eyes to the cortical and other centres; and the probable seat of pressure, from hæmorrhage, causing left lateral hemianopsia and left hemiplegia.

her faculties; the hemiplegic disability above referred to continuing, with the addition that the left intercostal muscles, and apparently the left half of the diaphragm, were observed to be involved in the motor paralysis affecting the left side.

In May 1891, eleven months after the operation, she came to the hospital to show herself, and was readmitted to undergo electro-massage treatment for the hemiplegia, which had remained in much the same condition. In other respects

she enjoyed excellent health, and her intelligence was unimpaired. On the patient's readmission Dr. George Mackay, assistant ophthalmic surgeon to the Royal Infirmary, made a most careful perimetric examination of the eyes, with the result of showing that the left lateral homonymous hemianopsia, which had been originally diagnosed, still persisted. His report and the perimeter charts are as follows:—

"External appearances normal, saving that the right pupil is a little larger than the left. Both pupils react to light and on convergence of the visual axes. No hemiopic pupillary inaction could be elicited. Ocular movements good. Ophthalmoscopic examination reveals transparent media, optic



The fields of vision were mapped out with M'Hardy's perimeter. The unshaded area in each chart indicates the field of vision for a 6 mm. disc of white paper. The serrated borders indicate parts at which precise delimitation was difficult on account of the patient's unsteadiness and want of intelligence.

discs rather soft and senile in appearance, but the retinal vessels of fair size and proportion, and the fundi free from pathological changes. Refraction hypermetropic; central visual acuity normal with each eye. Thus, R.V. = $\frac{6}{9}$, with + 1 D. Sph. = $\frac{6}{6}$; L.V. = the same; with + 2 D. Sph., reads small words of J. 1 with either eye at 12 inches. Charts of the field of vision were taken under considerable difficulties, as the patient constantly inclined her head, or followed the test object with her eyes. This was particularly noticeable when the left half-fields were being tested, and rendered the precise

estimation of the line of demarcation unsatisfactory. Colours were correctly named at the centre, but the estimation of the colour-fields had to be abandoned. There can be no doubt that she has a sufficiently decided and symmetrical impairment of the left half-fields to justify a diagnosis of left homonymous hemianopsia incomplete in extent and partial in degree. There is a slight peripheral diminution of the right half-fields, which may in part be due to her want of mental acuteness."

So far as known, this is the first example of trephining for a basal lesion, the case being diagnosed from the beginning as an apoplexy at the base. The success attending it will doubtless encourage the performance of that operation in similar cases, and, speaking generally, widen the basis whereby it is rendered justifiable.

History and Progress of the Case.[1]

E. H., æt. 46; lives in a lodging-house in the Cowgate; admitted 22nd June 1890; examined the same day.

Patient has spent the last twelve months in jail. She was liberated on 20th June, and started to drink immediately; drinking about two pints of whisky between Friday morning and Saturday night, when she was brought into the Infirmary about 10 P.M., dead drunk. Her stomach was washed out, and she was sent back to the police cells. She was readmitted this morning, in consequence of her inability to stand after recovering from the immediate effects of the liquor.

Patient is very restless, and, when left to herself, lies with her eyes shut, and a stupid expression on her face. She complains of great pain in the abdomen. The pupils are equal, the left does not appear to react to light. Patient is too stupid to test accommodation. There is slight flattening of the left side of the face, and falling down of the left corner of the mouth. The left eye cannot be closed so firmly as the right, and the left side of the forehead is not so wrinkled when the occipito-frontalis is in action. There is no deviation of the eyes or head. There seems to be almost com-

[1] I am indebted for part of these notes to James Ritchie, M.B., C.M., and to J. Watts Eden, M.B., C.M., my clinical assistants in Ward 6, at the periods referred to.

plete paralysis of the left arm. When asked to lift it, she does not do so, though she says she does. She affirms it to be put in any desired position, though all the time it lies helpless by her side. She complains of its presence constantly on her left side as the hand of some one else. When she grasps it with her right hand, she affirms it not to be her own hand, but soft like a doctor's. There is occasionally in this left arm, especially when it is grasped, a tendency to tonic spasms of the triceps and supinators, which causes the forearm to be extended and the arm retracted, with the hand turned back and the fingers flexed.

Patient can move the left leg, but sometimes she does not seem to have complete control over it, as apparently, especially after handling, there is flexion through spasm of the ham muscles.

The right side seems normal. There is complete hemi-anæsthesia of the left side. Plantar and patellar reflexes are present and equal.

Patient complains of pain in her head, on the right side, about halfway up, and there is a slight boggy swelling in front of the right parietal eminence. No unevenness can be detected.

Patient's mental condition is very confused, her speech is somewhat slurring; and she complains of pains and a feeling of pins and needles all over her body, but these cannot be localised.

Pulse is 60, well filled. Heart dulness is normal. Systolic and diastolic murmurs over the mitral area; systolic murmur over aortic area.

Patient complains of great pain in the abdomen, apparently of a colicky character, accompanied by borborygmi. Liver below costal margin. Abdomen much distended, and gives tympanitic note all over. Lungs are normal.

Additional Notes as to History.

Patient was liberated from prison on Friday morning at eight A.M. She was reapprehended at twelve noon for being drunk and incapable. She states that she was ejected from a public house, and in the process got a severe blow on the right side of the head. She was liberated on Saturday morning, again

got drunk, and was reapprehended in the evening. There was no evidence of any specific disease.

23*rd June* 1890.—Patient is in much the same condition this morning. There is more marked paralysis of the left side of the face. Arm and leg appear to be in a similar condition. There is left-sided hemianopsia. Patient's urine has had to be drawn off twice since admission.

11.30 P.M.—Patient is much more drowsy to-night; she has to be spoken to loudly before she can be roused, and shuts her eyes at once again, even while still talking. Tongue when protruded is turned to left, and sensation on that side seems perfect. There is no squint or conjugate deviation of the eyes. The hemianæsthesia is as pronounced as before. She seems to be deaf in the left ear. The plantar reflex is almost absent in the left foot; any attempt to raise the left arm causes spasms, chiefly at the shoulder, which brings the arm firmly to the side. There is not the same tendency as last night to abduction of the left leg; the right is either drawn up in bed or flexed at the knee, abducted, and rotated outwards.

24*th June*, 10.30 A.M.—Patient is lying quietly on her back. Pulse, 50; breathing, 24; very irregular in strength. Patient cannot be roused by shaking, cutaneous irritation, or shouting. Condition of limbs same as before. Right pupil dilated. No conjunctival reflex.

11 A.M.—Patient still comatose. Cheyne-Stokes respiration with pause rapidly increasing.

11.15 A.M.—Seen by Professor Chiene, who, at Dr. Smart's request, at once proceeded to trephine the skull. Making a curved incision round the parietal eminence, he removed an arch of bone with a 1-inch trephine just in front of this point. The skull was very thick. When the bone was removed, there was distinct bulging of the dura, with no pulsation. A branch of the middle meningeal artery was seen coursing over the middle of the opening. The dura was incised, and the brain tissue at once protruded through the wound. There was no hæmorrhage on its surface. It was of an extremely pulpy consistence, and broke up like thick cheesy pus. A director was passed in between the dura and the brain, over the occipital lobe, and in front over the ascending parietal

convolutions, and also down the fissure of Sylvius. There seemed to be a cavity in this region, and a second arch of bone was removed below, and in front of the former. The dura was also here very tense, and on being incised the brain presented the same appearances as before. A director was again passed in all directions, but no clot or evidence of it was found. Sinus forceps were passed without effect. There was a marked hernia cerebri all over the parts of the brain exposed. The patient who, before the operation, could not be roused, exhibited symptoms of sensation when the scalp was incised. Strict antiseptic precautions were observed. The operation lasted about an hour, the spray being used throughout. When the brain was first exposed, the breathing was much relieved. After the operation, while it still retained somewhat of the Cheyne-Stokes character, there was no pause present. The pulse was 72. Patient moved the non-paralysed parts of the body, repeatedly putting the right hand up to the region of the wound. On the face being irritated by the dermic-punctator, there were evidences of sensation in the right hand being put up to the face. Similar irritation of the left arm, and especially of the ulnar side of the forearm, caused contractions of the arm, especially at the shoulder, and also flexion of the arm.

1 P.M.—Pulse, 66; respirations, 28. Characters as before.

Patient to have—milk, ℥ iii.; extract of beef, 1 dessert-spoonful; brandy, ʒ i., by rectum, every three hours.

Patient moves right arm and leg freely; left arm kept firmly approximated to the side by spasm of the pectoralis major and latissimus dorsi.

Record of pulse rate.—Sunday, 12 P.M., 59.

Monday.—1 A.M., 59; 2 A.M., 58; 3 A.M., 58; 4 A.M., 56; 5 A.M., 54; 6 A.M., 54; 7 A.M., 53; 8 A.M., 53; 9 A.M., 59; 10 A.M., 54; temp., normal; 12 A.M., 60; 1 P.M., 54; 2 P.M., 68; 5 P.M., 60; 8 P.M., 54; 9 P.M., 60; 10 P.M., 58; 11 P.M., 55; 12 P.M., 54.

Tuesday.—1 A.M., 54; 2 A.M., 53; 3 A.M., 50; 4 A.M., 50; 5 A.M., 52; 6 A.M., 50; 7 A.M., 50; 8 A.M., 57; 9 A.M., 52; 10 A.M., 50.

2 P.M.—Patient being told to take her hand down from her

head did so, and on being told to put it up again, also obeyed. She put out her tongue when told to do so, and stated she was "very well," etc.

4.30 P.M.—Patient still in same condition. Quite conscious; answers questions; states she was in prison. Spasm in left shoulder not so marked. Breathing slightly of Cheyne-Stokes type, with, however, no pause, and more costal than before; 28 per minute. Pulse, 60, regular. Patient, when left alone, lies quiet, but sometimes is slightly delirious.

8 P.M.—Patient still conscious, and answers questions. Breathing slightly irregular in volume. Has had some milk and Valentine's meat juice by mouth, in consequence of not retaining the enemata.

25*th June.*—General condition improving. Patient conscious and quiet. Paralysis of motion and sensation on left side of face and left arm as before. Breathing regular, chiefly diaphragmatic, slightly costal. Pupils equal; both react well to light, and equally.

26*th June.*—Still quiet, and complaining of no pain or discomfort. Slept well.

28*th June.*—Patient complains of violent pain, as if due to pins and needles in her left side, especially in the leg. She has reflex movements all over her left lower limb, and over the greater part of her left arm, and when tested with Smart's dermic punctator she moves the limb touched. On testing the dorsum of the ring and little fingers, there are no reflex contractions. Reflex contraction is readily produced by pricking the dorsum of the other three fingers, and also over the palm. The plantar reflexes are present and equal on the two sides, and somewhat exaggerated. No abdominal or epigastric reflex can be obtained. The patellar reflex is easily obtained on the left side; on the right it is almost absent. Patient can move the left leg, especially in movements of flexion and extension. She can move the left arm at the shoulder; the arm still retains a good deal of its initial rigidity, but this has quite disappeared from the leg.

29*th June.*—Skin reflex same as yesterday. Patellar reflexes absent on the right side. There is still a tendency to flexion and pronation of the left forearm, with rigidity.

30*th June.*—Patient has the power of sensation over the left side of the face to-day. There seems to be some sensation in the left thigh, but it is often inaccurately localised, and referred to other parts. Pretty powerful stimulation is required to elicit it. The right patellar reflex is absent. Plantar reflexes same as before. There is still left-sided hemianopsia.

1*st July.*—Patient was sleeping soundly, and snoring a great deal, whenever she was seen to-day.

2*nd July.*—Patient complains of having felt very restless all night, and of great pain in both shoulders; her feet, too, she says, have felt very cold.

She can feel the slightest touch on the left side of her face. She seems to have no tactile sensibility over the left shoulder, but still retains the sense of pain. There is the same condition all over the left arm. The painful sensation is generally referred to a point proximal to that stimulated. She has tactile sensibility over the left side of the trunk, and to some extent over the left thigh, but over the leg and foot nothing save pain. The plantar reflexes are equal on the two sides and exaggerated; the patellar reflex is still absent on the right side.

The paralysis of the face is recovering. She can approximate her lips, as though to whistle, fairly well. There is still some difficulty in closing the left eye, owing to the weakness of the orbicularis. There is still left-sided hemianopsia.

The patient has six pints of milk and three eggs beaten up every day.

3*rd July.*—Patient feels pain over the left arm or leg, but has no sensibility to touch or temperature. A hot tube applied to the left side of the trunk gives a sensation of "jagging." She feels the contact of the cold tube, but often says that it feels like a "jag." The paralysis of the left intercostals in the infra-axillary appeared more marked to-day.

7*th July.*—Patient complains of intense pain, especially in the left groin. This pain is not like pins and needles, but is very intense and only comes on at intervals. She also complains of throbbing pain over the trephine wound in her head. This is almost certainly the result of her head hanging down

over the top of the bed; she had got into this position by kicking with her right leg. The sensation in her left side seems much as before.

8th July, 8 P.M.—Patient's temperature rose to 101°·4 Fahr. to-day. She is at present lying apparently asleep. Her breathing is regular, 24 to the minute. Type, thoracico-abdominal. There is a slight snore on inspiration, and the lips are puffed out with every expiration. The breath is very offensive. The face looks somewhat more puffed than usual. The external jugular veins are prominent, but that is not the result of regurgitation.

It is almost impossible to rouse her, and when she is awaked she hardly seems to understand questions. When she does, she answers them in so thick a speech it is almost impossible to comprehend her. She says she has no pain, and then relapses immediately into insensibility.

9th July.—Patient's temperature was lower to-day, but she lies in much the same condition as last night. Her face is much puffed, and the eyelids œdematous. She says she feels very bad, and is pained all over. When she is roused, she talks more sensibly than last night.

The wound was dressed. It was gaping considerably, and below it was a large rounded swelling; from this the puffiness of the skin went downwards and forwards over the right cheek, and extended to both eyes.

10th July.—Patient in much the same condition, but complains of feeling sick. Pulse in the morning, 94; respirations, 20; pulse in the evening, 120; respirations, 20.

11th July.—Patient still in the same stuporose condition; complains of feeling very sick, and at times belches up quantities of flatus; breath very offensive. Pulse, 104; respirations, 20. Patient complains of pain over her forehead, and thinks she has got erysipelas. The eyelids are now so swollen that she cannot open them. She was restless in the early part of the night, but slept well from 2 A.M. to 5.30 A.M. She takes her food well. She can feel pain on her left arm, but the movement which results from punching or pinching it is less than it used to be. The pain is referred always proximally to the site of stimulation. There is a remnant of

the initial rigidity, in a tendency to pronation of the left forearm.

12*th July.*—Patient in a similar condition, but eyelids are more swollen, especially the left. There is a red blush extending over the forehead and eyelids down to the cheek. Both halves of the diaphragm working.

13*th July.*—Patient improved; talks more rationally; is less stuporose, and the swelling of the eyes is not so great. Temperature, subnormal.

19*th July.*—Patient's temperature has kept down since last report. The œdema of the eyelids has disappeared. There is still complete paralysis of the left arm and leg. There is complete anæsthesia of the skin of the left arm and leg, but patient can feel pain; the sensation is somewhat delayed, and is referred to a point proximal to that stimulated. The skin of the left arm is desquamating, and the limb is wasting. The knee jerk is present on the left side, but absent on the right.

Nervous System.

11*th August* 1890.—*Subjective phenomena.*—Patient complains of great pains in the region of the shoulder, and also in front of the thigh.

Objective motor.—There is complete paralysis of the left upper extremity, from the shoulder downwards. Patient, however, has now the sense of its being her own arm and not a strange one, as she imagined formerly. There is spasmodic contraction of the pectoralis major muscle. It is in the humeral attachment of this muscle that the pain complained of is located. This spasm prevents the arm from being abducted from the side; otherwise the arm can be moved at will.

In breathing, the left side of the chest does not move so freely as the right. There is no observable difference in the abdominal muscles. The left leg can be moved in all directions freely. The inability to flex the thigh on the abdomen, until the psoas and iliacus were aided in their contractions, has passed off, these muscles being able to start the movement themselves. There is slight comparative paresis of the other muscles of the limb. The pains in it are caused by intermittent spasms of the rectus femoris muscle.

The facial muscles of the left side act, but exhibit an amount of paresis.

Sensory.—There is no sensation of touch, heat, or cold over the left side of the trunk, or in the left arm or leg. In the face the zone of sensibility extends over the middle line about 2 in. Sense of pain exists all over the left side, and seems to be exaggerated.

Reflexes.—Patellar and plantar reflexes present and equal on both sides.

Trophic.—The left arm and leg, generally speaking, measure 1 in. less than the right.

Mental.—Patient is extremely emotional, but is a most coarse-minded being, having apparently no sense of decency or modesty.

Other organs as before described.

The wound in the head has entirely healed. There is no bulging of the brain substance over the site where formerly it did so. There is a depression over the site of each of the trephine wounds, and pulsation can be observed there.

Sight.—There is decided diminution in the field of vision in both eyes. Homonymous hemianopsia.

Muscular power is diminished in the left leg; normal in right. There is well-marked contraction and rigidity of the left arm, but this can be easily overcome when the patient's attention is drawn away from the arm.

The respiratory movements of abdomen are almost entirely confined to the right side during normal respiration. Movements of chest, during normal respiration, are much more marked on left side than on the right. During forced respiration there is more movement on right side, but it is still less than on the left.

Patient walks with the toes of the left leg on the ground, and drags the leg considerably.

Power of balancing the body is normal.

Intelligence is not at all acute.

Patient sleeps fairly well.

8th February 1893.—The patient's health and general state remain, we believe, at this date, much the same as reported in May 1891 at page 283 of this paper.

APPENDIX.

Whilst revising the proof-sheets of this paper, Dr. Joseph Bell, of Edinburgh, drew my attention to Dr. Frederick S. Dennis' communication to the *New York Medical Journal* of the 24th December 1892. The title of Dr. Dennis' paper is, "Operative Interference in Cases of Cerebral Hæmorrhage *not* due to Traumatism."

The cases of cerebral hæmorrhage, to which Dr. Dennis directs special attention, are not those resulting from external injury, or violence, but originate in pathological changes in which traumatism plays no part, and in regard to which he affirms that little or nothing has been written, and nothing done. Dr. Dennis reports the following nine cases, coming under his own direct observation, as belonging to the category of the non-traumatic cerebral hæmorrhages for which no surgical interference had hitherto been proposed or deemed justifiable:—

Case 1.—G. W., admitted unconscious to Bellevue Hospital, 10th April 1892, and died the following day. He was known to be a confirmed drinker. Before death, convulsive twitchings were present on right side of face, accompanied with anæsthesia of the same part. The autopsy showed clot over face-centre on left hemisphere; also a cyst containing clear serous fluid. The cyst occupied nearly the whole of the caudate nucleus.

Case 2.—T. G., æt. 33 years, was admitted to the alcoholic cells at Bellevue Hospital, 11th May 1892. The patient, though half conscious, could be aroused. He had been a heavy drinker. He had left his place of business late in the afternoon of the day he was admitted. About 9 in the evening he was found in the streets, and taken to the hospital. When examined, his head was found turned to the left side. There were convulsive movements of the right side of the body; but no marked disturbance of the sensibility, or of the ocular or other reflexes. The autopsy showed a large clot

on left hemisphere. The hæmorrhage was from vessels in a pachymeningitis interna hæmorrhagica.

Case 3.—W. M., æt. 40 years, was brought to St. Vincent's Hospital, about 1 o'clock on the morning of 26th June 1890. The patient was, on admission, comatose, and died on the following day. On autopsy, a subdural clot was found compressing the right hemisphere. Skull not fractured, and no sign of other external injury of the head. The source of the hæmorrhage was the same as in the preceding case.

Case 4.—W. M., admitted to Hospital, 18th December 1892. Unconscious, and died in a few hours. A cyst filled with serum was found beneath the dura mater; and also a blood clot, under the dura, over the left occipital lobe. Dr. Dennis greatly regrets that in this case no complete record was taken of the nervous phenomena in this case. He thinks the results of an ophthalmological examination would have been of much clinical interest. The hæmorrhage in this case was from connective tissue vessels under the dura mater.

Case 5.—J. O'N. was taken from the street by ambulance on 8th February 1891, and brought to St. Vincent's Hospital. Died shortly after admission, unconscious. A cyst, with fluid, was found between dura and pia, and also a small clot on left side of hemisphere (?) The pressure in this case was mainly due to the cyst, which was practically a pachymeningitis interna hæmorrhagica.

Case 6.—W. L., æt. 30, was brought by ambulance to St. Vincent's Hospital, February 1891. Patient was unconscious, and died same day. A subdural clot covered nearly the whole of the right hemisphere. The hæmorrhage, as in the preceding case, was from a pachymeningitis interna.

Case 7.—J. V., æt. 65, was found, on the evening of 2nd April 1892, in a lodging-house in the Bowery. He was taken to St. Vincent's Hospital by the ambulance. He was then found to have a right hemiplegia and hemianæsthesia,

including face. There was also aphasia; but the patient was perfectly conscious and intelligent. He died five days after admission. A clot was found adjacent to third left frontal convolution. Hæmorrhage arose from the dural vessels.

Case 8.—J. R., admitted to St. Vincent's Hospital, 16th June 1891. He died two days after admission, not having regained consciousness. A clot was found covering the whole of right hemisphere. The arteries in the circle of Willis were atheromatous. There was also pachymeningitis from the vessels of which the hæmorrhage had occurred.

Case 9.—J. T., æt. 40 years, whilst in Bellevue Hospital in 1884, and recovering from an operation for the radical cure of hernia, suddenly became hemiplegic on the right side, and died in a few days. Hæmorrhage over left hemisphere was present, and could be traced to a pachymeningeal source.

Dr. Dennis forcibly remarks, in reference to these nine cases, that they belong to a category in which the operation of trephining had not been practised, and would scarcely be held justifiable. "But," he adds, "if the same group of symptoms were found in a case in which there had been injury or violence, the patient would be trephined, with the likelihood of relieving, not only from present suffering, but also from certain death, many who, in the absence of traumatism, were hopelessly relegated to the police cells, or to the alcoholic wards."

I would take the opportunity of here remarking, in connection with Dr. Dennis' cases, as will be evident from the detailed account of E. H.'s case, which forms the subject of this paper, that although she had slight abrasion of the scalp on one side of the head, it was not such as to cause the grave cerebral lesion from which she was dying when brought to the hospital. The basal hæmorrhage present was undoubtedly connected with pathological changes brought about in the vessels by her chronic drinking habits. Her case was a typical one of the habitual drunkard; and, in fact, she was sent from the police cells to the alcoholic wards of

the Royal Infirmary at the time she came under my observation. Her case may, therefore, be taken as representing not only those to which Dr. Dennis refers, but, besides, a much larger group, including cerebral apoplexies generally. Professor Chiene, who was good enough, at my request, to trephine E. H., has since repeatedly declared his opinion, prompted by the exceptionally great success of the operation, that he would now feel justified in trephining in every case of cerebral hæmorrhage.

Looked at in the light of the pathological nature, seat, and extent of the lesion, the stage at which the operation was performed, and the immediate and complete recovery of the patient at the point of death, we are warranted in the belief that E. H.'s case is without parallel in the history of cerebral surgery.