time remember that it will only destroy what it reaches, and although it is extremely remarkable to find that the cancer tissues seem to dwindle under its influence, whilst the healthy tissues resist it, still, remembering the acid juices of cancer, remembering the mode in which it penetrates into the vacuities of the living tissues, what a tendency it has towards them, and remembering that in spite of electrical destruction this may go on, and then considering again the requisite repeated application of electricity, which come to be like the repeated application of a cautery of a simple character—remembering all this, I say we may find that it will ultimately be regarded as inferior to the knife.

The knife, which sounds so cruel, but which is not indeed cruel under the influence of anæsthetics and the use of antiseptic treatment—the knife is the most feasible method of removing these things. After the knife, however, I certainly, in my own practice where I have the slightest doubt, apply some kind of acid caustic. I do that, and I have found it extremely valuable. I have not cumbered this lecture with personal records, but when I look back to my own experience, I find cases in which accidental hæmorrhage came on, and in which I had to undo a wound and apply powerful caustics—perchloride of iron, and perhaps chloride of zinc. There are special cases, in which I could point to persons living and now perfectly well, eight, nine, ten, eleven, twelve years since operations of that kind. Comparing these cases with the hesitating use of the knife, which formerly I myself practised, keeping as near to the growth, as I was told to do by my teachers, as near to the tumour as possible, without, of course, leaving any ostensible mass behind, still keeping close to it—when I compare these later cases with those I had under observation twenty or thirty years ago, I say their success is very remarkable.

It is truly gratifying to find that success follows in proportion as you remove tissues, in proportion as you work up to the axilla and remove the axillary glands, and even cauterise the base of the wound if there is the slightest sort of suspicion about it. The gratification which one feels at the success of these operations convinces me that that is a most important practical point and a lesson never to be lost sight of.

Now, Mr. President and Gentlemen, the hour is at hand; of course you will all understand that a lecture of this kind is but playing on the surface of a great subject. If it is ever published, I may venture to append or introduce here and there illustrations that will carry perhaps conviction to some of your minds, who may not quite have followed me in all I have said. But in the meantime I thank you for listening to me for this hour, and I invite your attention to the diagrams and to the preparations which are upon the table.

NORTHAMPTON (Population, 61,352).—Beneficial Results of Sanitary Efforts: Want of an Infectious Diseases Hospital.—The health of this urban district for 1888 must be regarded as exceptionally favourable, for the death-rate (15.6 per 1,000) is the lowest recorded for a period of thirteen years (1876 to 1888). The history of the seven principal zymotic diseases is equally satisfactory, there being a most manifest diminution in the mortality from these diseases compared with the previous year, while there was much less prevalence. Mr. Lee F. Cogan states that no case of small-pox came under notice in the borough, but there were two cases at Kingsley, in the rural district, which had been imported from Sheffield. Only four deaths were registered as due to measles and eight to whooping-cough. Scarlet fever prevailed during the whole year, but did not assume any serious proportions. Eight cases of typhoid fever were brought under notice, seven of which were fatal. A most searching and complete examination was made of the sanitary arrangements and surroundings of the houses in which the patients lived, but in only two was any faulty condition discovered which could in any way be associated with the origin of the fever. The statistics of the past thirteen years (Mr. Cogan's tenure of office) exemplify very distinctly the beneficial influences on the health of the community exercised by the administration of the Sanitary Acts. There is evidence of progressive and substantial improvement in the diminution in the death-rates from both general and zymotic diseases. A serious deficiency in the sanitary organisation of the town is the lack of a hospital for isolation purposes; and for the speedy remedy of this deficiency Mr. Cogan pleads in very forcible language, which, it is to be hoped, may have the effect desired.

ABSCESS OF THE LIVER: TREATMENT.

Read in the Section of Medicine at the Annual Meeting of the British Medical Association, held in Leeds, August, 1889.

By VAUGHAN HARLEY, M.B.

HAVING enjoyed the advantage of seeing abscesses of the liver treated both in the tropical East and the temperate West, it may not be unacceptable to the profession if I describe what, I think, may with some degree of truth be designated, "A rapid mode of curing hepatic suppurations."

All having had much experience in the treatment of liver abscesses are aware how exceedingly troublesome it is to get them to close up after they have been evacuated; and that, not only does the emptied suppurating cavity occasionally refill more than once, but after a free counter-opening has been made, pus will continue to ooze away for weeks, aye, even months, equally to the discomfort of the patient and discontent of the doctor.

Several methods of treating liver abscess are at present before the profession, each professing to possess special advantages; but not one of these appears to me to be either so simple, or so successful, as that which I am now about to detail, as well as to illustrate the advantages of, by narrating the results which attended its adoption in two most unfavourable cases for treatment.

Before relating them, however, in order that the subject may be perfectly plain to those who have not paid special attention to it, I will tabulate some of the general principles in connection with liver abscesses, which teaching, reading, and experience have taught me to regard in the light of pathological aphorisms.

1. That the hepatic abscesses of the tropics differ in no essential feature whatever from the same forms of suppurations occurring in temperate zones, except in one single particular, that of relative frequency.

2. Men are far more liable than women to liver suppurations.

3. Although an abscess of the liver may occur at any period of life, it is much more common between the ages of 20 and 50 than at any other.

4. Suppurations of the hepatic tissues are most frequently met with in strumous subjects; and the most unsatisfactory cases of all to treat are those in which a syphilitic taint is superadded to a constitutional struma.

5. The most noted predisposing causes to liver abscess are struma and alcohol—even when alcohol is indulged in within what is usually regarded as the limits of moderation.

6. The commonest of all the exciting causes is a sudden chill, as pointed out by Sir William Moore.¹

7. All abscesses of the liver tend to evacuate themselves by burrowing their way to the surface of the organ, and seeking an outlet for their contents either directly through the abdominal walls, or indirectly (in general) through the pulmonary or digestive systems.

8. It is futile to evacuate a liver abscess either by knife or trocar so long as a free opening is not left to give escape to the subsequently formed pus.

9. When an accumulation of pus has taken place in the liver it not only tends to do serious mischief by causing disintegration of the hepatic tissues, but, from its becoming putrid, to kill the patient by blood-poisoning. This likewise occasionally happens when hydatids of the liver suppurate, which they frequently do when they contain daughter cysts.

10. Cancerous and tubercular deposits in the liver, by disintegration, sometimes lead to the formation of purulent formations.

11. As a natural corollary to these facts, I think all will admit that so soon as the existence of purulent matter is detected it should be evacuated, and the speedier this is done the better will be the patient's chances of recovery.

With these general remarks I shall now describe what seems to me to be the most satisfactory mode of operative procedure in cases of hepatic abscess.

So soon as the presence of pus is suspected its exact situation should be prospected in the following manner: A 6 inch long fine exploring trocar is to be passed up to its hilt obliquely from right to left into the liver, or from left to right, according to which lobe the abscess is supposed to occupy. The pus is then searched for by slowly and gradually withdrawing the instrument

¹ *Lancet*, October 31st, 1885, p. 798.

so as to allow sufficient time for a drop to appear at its orifice. If pus be found, both its situation and depth in the organ is to be carefully noted. Should blood instead of pus flow from the trocar the bleeding ought to be encouraged; for in all cases of suspected hepatic abscess the liver tissues are more or less congested, and marked benefit is likely to arise from a free hepatic phlebotomy. The presence of pus having been substantiated before withdrawing the exploring cannula, allow as much as possible to flow from it. As pus, especially thick pus like that usually met with in the liver, does not flow readily through a fine cannula, immediately on its ceasing to flow withdraw the exploring trocar, and introduce, in exactly the same direction and to precisely the same depth, one of the diameter of a No. 8 or 10 sized English catheter, and through it empty the abscess completely by aid of an aspirator. As soon as the cavity is empty, before withdrawing the cannula, wash it out with tepid water, containing 10 grains of boracic acid to the ounce, and continue the washing-out process until the solution returns clear and odourless. Immediately after this insert as large a sized silk elastic catheter as will pass through the cannula into the abscess cavity. Now withdraw the cannula, and after having cut off the extruding end of the catheter to within an inch and a half of the opening in the abdominal wall securely fasten it there.

This done, cover the whole over with a large hot sloppy linseed poultice. The abscess cavity should be washed out with boracic acid solution night and morning, and poultices constantly applied until the purulent discharge almost entirely ceases. If, however, as occasionally happens, the cavity rapidly refills with pus, another opening is to be made a short distance from the first, and a second drainage tube introduced into the abscess cavity. This counter-opening, by facilitating the washing out process, greatly expedites the cure.

While in Hong Kong I noticed that Dr. Patrick Manson, instead of daily washing out hepatic abscesses with an antiseptic solution, relied for the complete emptying of their cavities on the employment of a yard or more long syphon drainage tube. This I need not describe, as he is about to publish his mode of treating liver suppurations. The advantages of the mode of treating abscess of the liver now being advocated will be best appreciated, I think, by the narration of its results in two of the most unfavourable cases that it is possible for me to give.

The first case is one in which the patient very nearly died from the effects of blood poisoning, arising from the absorption into the circulation of toxic matters from the putrid pus in the abscess. The second is one of "multiple abscess" occurring in the greatly enlarged liver of a strumous patient. Both cases, notwithstanding their exceedingly unfavourable nature, as will be seen, made rapid recoveries under the line of treatment just described.

CASE I was that of a gentleman of delicate constitution, aged 29, who up to the age of 20 repeatedly suffered from occasional attacks of congestion of the liver, as well as from diarrhoea. He had a particularly severe attack of hepatitis while a student at Oxford in 1880-81, and in 1883 had an empyema of the right side, and, not regaining his strength after it was evacuated, he was sent on a long sea voyage.

The suppuration of the liver, about which I have now to speak, seems to have begun in the latter part of 1887 and beginning of 1888, while he was residing at Cannes. From notes of his case kindly furnished to me by Dr. Clemow it appears he had pleurisy of the right lung associated with the liver disease. In February, 1888, he had three distinct rigors; and Drs. Frank and Clemow, suspecting liver abscess, explored the organ in three places on the 19th of that month, but found no pus. That same night the patient had another very severe rigor, and, as the symptoms did not improve, and still pointed to hepatic suppuration, they again explored with a larger aspirating needle on March 10th, but again with a negative result; so they deemed it advisable to practise hepatic phlebotomy, and drew off between four and five ounces of dark venous blood. This bleeding, small though it was, acted most advantageously, for after it the symptoms rapidly improved, the temperature becoming and remaining normal, the liver dullness diminishing, and the patient gaining flesh.

In the month of June, after his return to England, the patient again became very ill, complaining of constant hepatic pain, shortness of breath, loss of strength, and exhausting feverishness.

On July 18th Dr. McEnery, of Sherborne, brought him to London, and consulted Sir Andrew Clark and Dr. George Harley. The former, after carefully examining the lungs, pronounced them comparatively healthy; the latter found the liver diseased, its

left lobe being not only enlarged and indurated, but conveying to the hand the feeling as if it contained a deeply seated tumour.

At this time the patient was exceedingly weak, both in body and mind; his intellect, indeed, was so perturbed and his memory so defective that he could give no intelligible account either of his past history or present symptoms. He had even forgotten the names of his doctors, or that he had ever had either shiverings or sweatings; notwithstanding that both had been very marked. The cause of this great mental confusion was afterwards found to be due to the toxic effects on the brain of blood-poisoning.

The result of the consultation having led to the conclusion that the tumour in the left lobe of the liver was probably an abscess, it was arranged that an exploration should be had recourse to. Accordingly, on July 23rd, Dr. George Harley, in the presence of Dr. McEnery and myself, performed the operation. The patient's temperature at the time was 102° F., his pulse 108, and he had profuse sweatings, without, however, any diarrhoea. His face was of a cachectic yellowish livid colour, and wore a most anxious expression. The liver dullness reached, as shown in diagram (Fig. 1) from the right nipple to the navel, and projected at least two inches and a half to the left of the mesial line.

The effect of the poultices, which had been assiduously applied since the consultation on the 18th, had proved most favourable, for now there appeared to be an indistinct fluctuating area surrounded by a hard rim about one inch and a half directly above the navel (Fig. 1, a).

Fig. 1.—The dark area denotes the liver dullness extending from the nipple to the umbilicus, and three inches to the left of the mesial line; a is the point at which pus was suspected, and afterwards ascertained to exist, and through which it was subsequently evacuated with a trocar.

On a large-sized aspirating needle being introduced into the centre of this doubtfully fluctuating area, a quantity of extremely foetid, blood-stained, putrid pus made its appearance. So offensive was its odour that not only was it almost intolerable to us three medical men, but even the patient, ill though he was, held his own nose, a very unusual thing, as Dr. George Harley remarked, seeing that people can in general tolerate the bad smells emanating from their own bodies much better than anyone else. Even the silver cannula, although it was not twenty minutes in the abscess cavity, was rendered jet black by the sulphuretted hydrogen the pus contained.

After about 18 ounces of pus had been removed, the abscess cavity, appearing to be pretty well emptied, was washed out with a tepid water solution of 10 grains of boracic acid to the ounce until the solution returned clear and almost odourless.

A drainage tube was then inserted into the cavity, which measured in a direct line backwards $5\frac{1}{2}$ inches in depth, and a hot poultice applied. It was noticed that immediately after the abscess was emptied the abdominal walls receded, and left a saucer-shaped depression round the seat

of the wound. The pus, on standing, separated into three distinct layers: an upper one of a dirty yellow colour, a middle one of a pale green tint, and a lower stratum of a decidedly pink hue. Under the microscope, besides pus and blood cells, I found a great many large exudation corpuscles.

By the following morning a marked improvement had taken place in the condition of the patient. The pulse, instead of being 108, was only 99, and his temperature had fallen two degrees, that is to say, to 100°. The discharge was, however, still very foetid, so that the cavity had not only to be washed out night and morning with boracic acid solution, but an antiseptic mixture of sulphate of iron and quinine given to the patient.

The next day a still more decided change for the better was observed, his temperature being only 99°, although the pulse remained about the same, namely, 99 per minute. On the fourth day, in spite of the drainage tube acting well, the abscess cavity had refilled with putrid pus; so Dr. George Harley made a second opening with a No. 10 sized trocar, about two inches from the first, and introduced another drainage tube into it. These two openings enabled the cavity to be thoroughly washed out; for, while the boracic acid solution was pumped in at one it flowed freely out by the other opening. From the second being also a somewhat larger drainage tube than the first it more readily permitted the numerous small blood clots and pus flakes to come away. On the fifth day the temperature was normal and the appearance of the patient greatly improved. The exhausting sweatings had ceased. The pus, though now thin and only slightly foetid, was still so copiously discharged that the poultices were discontinued and absorbing wool used in their stead.

On the 29th, that is to say, six days after the first operation, the discharge ceased to be foetid, and the abscess cavity was so greatly diminished in size as only to admit the probe one inch and a half, the patient being, at the same time, able to leave his bed and recline on the sofa. The following day he was well enough to get up to breakfast and to eat with an appetite a couple of eggs along with bread and butter. He said he now tasted the flavour of his food, everything previously having tasted as if it was foetid. Moreover, the confusion of ideas no longer existed, and he had regained his memory. The appearance of his face, too, was entirely changed; the cachectic hue had disappeared, and was replaced by a healthy colour. The most curious thing, however, was that not only had the saucer-like depression over the seat of the abscess vanished, but the cavity itself seemed to have become filled up with liver tissue! At least, the sensation yielded to the hand in that situation in no way differed from that communicated to it by any other part of the liver. The discharge, too, was now so slight that the boracic solution returned quite clear.

Having to start next day for China I handed the case over to the care of Dr. Cullimore, and from this point the notes are taken from my father's casebook.

August 4th. Although it is only the twelfth day since the operation the patient is so well that he returns to the country along with Dr. McEnery to-day. A probe now merely penetrates about half an inch into the liver, if it even does so much as that, for the thickness of the abdominal parietes being in this case an unknown quantity it is impossible to say exactly how far the probe enters the liver substance.

On August 17th the patient came to town looking perfectly well. He says that he eats with a good appetite, has gained a stone in weight, and feels himself every day getting stronger. There is only a drop of discharge from each of the wounds, and that probably comes from the abdominal walls, and not from the liver at all.

September 29th. The liver is quite normal in size. He has no pain or discomfort whatever, even when he walks, rides, or drives. So he may be said to be perfectly well.

P.S.—April 25th, 1889. I have to-day heard that he is well and strong; stronger, indeed, and in better health than he has ever felt before. The last news I have of him (July 15th) is that he is engaged to be married.

CASE II is one of another kind, being one of multiple abscess in a strumous patient aged 17. The lad, who is the son of a Lincolnshire farmer, is described as having been suddenly seized with a pain in his liver, associated with sickness and shivering, in June, 1888. On September 3rd, after walking twelve miles with a drove of cattle, he felt so ill that he had to be brought home in a carriage and placed under the care of Mr. Heaven, of Colsterworth. The following history of the patient I abridge from Dr.

Cooper Key's notes of the case:—On September 18th "I saw him in consultation with Mr. Heaven. He was very pale, with a small, weak, and frequent pulse. His temperature was 102°. Tongue coated; bowels irregular, with occasional attacks of diarrhoea and a good deal of pain over the hepatic region. In addition, there was a considerable amount of fluid in the cavity of the peritoneum, and a slight *bruit* over the left base of the heart."

The patient was subsequently seen by Dr. Newman, of Stamford, who suspecting hepatic abscess, explored the liver in two places, but found no pus. Early in November, the symptoms being urgent, he was sent to London to consult Dr. George Harley. On November 19th, the patient being placed under the influence of A. C. E. mixture, Dr. George Harley, assisted by Mr. Heaven and myself, proceeded to operate, making eight punctures into the liver with his long trocar without obtaining pus. The liver being exceedingly large, measuring four inches to the left of the mesial line, and two beneath the umbilicus, phlebotomy was attempted, but only a very little blood was obtained. During the night, however, profuse hæmorrhage took place through the bile-ducts into the intestines, and at 1 o'clock in the morning I found the patient in a state of collapse. In two hours (after the administration of brandy) he rallied, and, somewhat to our surprise, the bleeding was followed by the most satisfactory results, as within thirty-six hours the liver's dulness had diminished an inch and a half all round.

Fig. 2.—The dark area represents the extent of liver dulness, from the nipple to two inches below the umbilicus, and four to the left of the mesial line. The dots indicate the points at which the exploring trocar was introduced: *a* is the seat of the first abscess, evacuated November 25th; *b* the seat of the second abscess, emptied November 28th.

On November 25th appeared a circumscribed swelling 2 inches above and slightly to the right of the umbilicus, with a feeling of deep fluctuation; and Dr. George Harley explored it, and was successful in hitting the abscess. It contained very viscid pus. A short length of a silk elastic catheter was then placed in the cyst, and it was washed out twice daily with a 10 grains to the ounce solution of boracic acid. The temperature was 103°, and pulse 120. During the next few days the pus became very offensive, and carbolic tow was placed over the poultice to catch the discharge, which was very profuse.

On November 28th a second abscess appeared in the right lumbar region on a level with the umbilicus. This was opened, and found to communicate with the other. A drainage tube was passed into it, and the boracic acid solution used twice daily to it also. The temperature was now 101°, the pulse 112, and the discharge thin and less foetid.

November 30th. Temperature 100°, pulse 108.

December 1st. A slight rigor. Temperature 101°, pulse 102.

December 3rd. Temperature fell to 100°, pulse 100.

December 21st. Temperature 98°, pulse 80. No longer any discharge.

January 2nd, 1889, that is to say, on the thirty-eighth day after the first abscess was opened, the patient returned to his home in Lincolnshire, a distance of 120 miles, without a single bad symptom."

In a letter from Mr. Heaven dated May 12th, he says: "G. is gaining flesh and strength rapidly, and going about as usual. There is no pain or tenderness about the liver, except a little on pressure over the seat of the abscesses."

Not only do I consider the rapidity of the recovery in this case remarkable, but that any recovery should have taken place at all, in such a weakly constitutional strumous patient, seems to me surprising; all the more so when I mention that so great is the tendency to suppurations in the lad that Mr. Heaven says, in a letter dated August 1st, that he had a few days before drawn "off a large saucerful of thick pus" from his left side—the exact seat of the suppuration not being specified.

When all the foregoing facts are taken into consideration, I scarcely think that anyone who has had much experience in treating abscesses of the liver can fail to be struck with the satisfactory results in the above-cited cases, as two more unfavourable ones for any line of treatment whatever it would be difficult to find. It is, indeed, on this very account they were selected to illustrate the advantage of treating liver suppurations in the manner I have described, and which may be briefly summed up in the three following sentences: First, by the employment of boracic acid we have not only the assistance of a thoroughly safe antiseptic agent, but the great advantage which accrues from the use of one free from the objection of coagulating the albuminoids in the pus, and thereby inducing a fouling of the instruments, such as is unfortunately the case with carbolic acid and most other antiseptic preparations. Secondly, the daily washing out of the abscess with boracic acid solution not only expedites the healing process by keeping it clean, but has the further advantage of rendering it quite unnecessary to take any precautions against the intrusion of air into the cavity, no matter how large it is. Thirdly, the washing out of the abscess with boracic solution, from its enabling us to get rid of all the purulent matter, thick as well as thin, does entirely away with the necessity of making a large opening either in the abdominal walls or liver tissues with a knife or other instrument—a point of no mean moment, seeing that it is a well recognised axiom that the smaller the breach of continuity in any animal tissue, no matter whether it has been made accidentally or intentionally (other things being equal), proportionally quicker is the healing process.

Dr. GEORGE HARLEY, in reply to the question of the danger from hæmorrhages arising after exploring the liver, said that no doubt there did exist danger, but only when the explorations were improperly performed; for, as he had explained at the meeting at Brighton when Professor Boyes Smith related his case of hæmorrhage into the abdominal cavity after exploring the liver for abscess, the danger only arose when the instrument was thrust into the liver at a point of the organ where pressure could not be applied by bandaging the abdominal walls sufficiently tightly to make them close up the opening of the puncture into the liver. He need not repeat his remarks on the subject, as the whole matter had been fully gone into in a paper published in the JOURNAL² in reply to Dr. Boyes Smith's criticisms upon his paper on Hepatic Phlebotomy read at the Brighton meeting.

THROMBOSIS OF VERTEBRAL ARTERY PRESS- ING ON GLOSSO-PHARYNGEAL NERVE: UNILATERAL LOSS OF TASTE AT BACK OF TONGUE.

Read in the Section of Pathology and Physiology at the Annual Meeting of the British Medical Association, held in Leeds, August, 1889.

By FRANK M. POPE, M.B., M.R.C.P.,
Physician to Leicester Infirmary.

THE question whether the glosso-pharyngeal nerve is a nerve of taste is still *sub judice*. Dr. Gowers, in the last edition of *Diseases of the Brain*, p. 209, says: "There is no recorded case in which the roots of the glosso-pharyngeal nerve have been diseased, and

indeed, no case in which there were symptoms of disease limited to the nerve roots of the medulla, and in which there was any loss of taste." The present case seems to me to belong certainly to the more general and probably to the latter of these two categories.

S. K., aged 76, a labourer, who had always enjoyed good health, felt weak on May 17th, 1889. He fell down on getting out of bed on May 18th, but did not lose consciousness; after this he was unable to swallow anything or to stand. There was no affection of speech, no pain in throat, no urinary trouble. He was admitted to the Leicester Infirmary on May 21st. He walked with much difficulty when supported by two persons. He was a large heavy man. The power of the left arm, hand, and leg was much diminished but not abolished. He was quite unable to swallow either liquids or solids. The house-physician considered that there was slightly less expression on the left side of his face than on the right, and that the right side moved more when speaking. This I could not see; at all events, there was far from extensive or general facial paralysis. The left pupil was much smaller than the right, and insensible to light. An œsophageal bougie or tube passed readily into the stomach.

On the next day, after he had been fed by the stomach tube, it was noticed that in addition to the expectoration of a very large quantity of frothy mucus, he regurgitated the greater part of the food that had been given him, also that the left side of the soft palate was higher than the right. The tongue was protruded in a straight line. Suspecting interference with the glosso-pharyngeal nerve I investigated the condition of his sense of taste. Two substances were employed: (1) a weak solution of acetic acid and (2) simple syrup. The tongue was thoroughly dried, and a drop of each solution in turn placed on it with a glass pipette at four different points—namely, at back and front of each side of the tongue, about half to three-quarters of an inch from the median line. Precautions were, of course, taken to thoroughly free the mucous membrane from one solution before applying the other. On the right side he tasted them well, and distinguished for himself between what he called the "sharp" and sweet tastes. He was told to signal with his hand the instant he commenced to taste, and his latent or conductive period was, as far as I could judge, rather short. On testing the left side neither solution could be tasted at the back of the tongue; the acid was tasted at the tip of that side, the sweet solution not being perceived in the latter situation.

From the great contraction of the pupil as well as the other symptoms described, it was thought probable there was a small hæmorrhage into the pons Varolii.

On May 27th, though other symptoms were unchanged, he was weaker, and complained of pain on the left side of the head and face, but said that it was numb to the touch. He could feel the prick of a pin well in the area complained of, but not stroking with a blunt instrument. After this he got rapidly weaker, and died on May 29th.

At the necropsy the left vertebral artery was found distended to about a quarter of an inch in diameter, and occupied by a firm clot for its whole course inside the theca vertebralis to its junction with its fellow of the opposite side. The enlargement was fusiform and regular; there was no sacculation. The brain was carefully examined and appeared normal. There was no valvular disease of the heart. All the other organs were healthy.

Here we have, I think, as clear evidence of the taste function of the glosso-pharyngeal nerve as could have been afforded by a precise laboratory experiment. The dilated artery pressed directly on the roots of the nerve, paralysis of which was shown by the loss of power of swallowing and the raising of the palate on the left side, due to the unopposed action of the levator palati. This is, of course, assuming that the glosso-pharyngeal is really the motor nerve of the palato-glossus and superior constrictor of the pharynx. The only other nerve involved was the pneumogastric, which cannot be supposed to have any influence on taste. The fifth was quite out of the region of pressure, as was the facial. The myosis and weakness of arm and leg on the same side as the tumour were doubtless due to deficient blood supply to the descending pyramidal tract on that side. The hypoglossal nerve, as evidenced by the tongue being protruded in a straight line, escaped pressure doubtless from the position of its roots on the opposite side of the artery to the two nerves already mentioned, namely, glosso-pharyngeal and pneumogastric. I am unable to account satisfactorily for the pain and numb feeling on the left side of the face. There was not complete anæsthesia, and in fact little loss

² JOURNAL, January 15th, 1887.