

STATED MEETING, HELD MAY 4, 1908.

DR. G. G. DAVIS in the Chair.

HÆMOPHILIA TREATED BY TRANSFUSION.

DR. FRANCIS O. ALLEN related the history of a boy of twelve, who was admitted to the Presbyterian Hospital a year ago, with a history of having bled from the mouth for four days previously. The bleeding had been profuse.

On admission, the patient was comatose, very pale, the skin was flabby and waxy, and a thin stream of blood was oozing from the mouth.

He was treated for two days with various drugs and with saline solution subcutaneously. The oozing continued, and the boy became weaker and more deeply unconscious. The hæmoglobin on the day of admission would not register on a Hare hæmoglobinometer, which does not register below ten. The resident physician estimated it as four. The next day it was estimated as five. The blood from the mouth tinged the pillow-case a pale yellow.

The second day after admission, Dr. Stryker, in whose care the boy was, asked Dr. Allen to transfuse the child. This was accomplished after much trouble, an uncle of the child consenting to be the donor. The technic was bad, owing to a lack of the proper instruments. The boy must have received only a small amount of blood, but how much it was impossible to state. During the operation, his mental condition changed, becoming bright enough for him to complain of pain and call the doctor hard names.

Two days after the operation, the hæmoglobin had risen from five to fourteen, and the red cells from 1,060,000 to 1,240,000. The bleeding stopped after the transfusion, but recurred slightly at intervals for the next five or six weeks. The hæmoglobin continued to increase.

On the 4th of June, one month after admission, the hæmoglobin registered sixty-eight, and the red cells 3,930,000. The

boy was discharged in good condition the only thing observable being that the teeth were carious and very irregular. It was almost impossible to tell where the bleeding came from; at times it seemed to come out of the teeth themselves, two of which were mere shells; at other times, it seemed to come from the edge of the gums.

The boy has been back to the hospital three or four times since. During the past winter he was admitted with hæmoglobin registering fifteen. He was not transfused on this occasion, but treated medically. The hæmoglobin gradually rose. Two or three weeks ago he was in fair condition, although he had one swollen knee-joint, and there was a slight oozing from the gums on the least provocation.

HEMORRHAGE FROM THE BOWEL FOLLOWING APPENDECTOMY.

DR. CHAS. F. MITCHELL related the history of a woman, aged twenty-six, who was admitted November 14, 1907, to the surgical ward of the Pennsylvania Hospital under the care of Dr. J. P. Hutchinson, with the following history:

Previous history negative: menses began when she was seventeen years of age, always regular, lasting four or five days, painful at times. No vaginal discharge. Has been married three years, and has had three children. Thinks she had a miscarriage about six weeks ago. Never was troubled with hemorrhoids or bleeding from the bowel, previous to admission.

Came to the hospital complaining that for the past six weeks she had almost constant bleeding from the vagina. When not bleeding there was a mucopurulent vaginal discharge present.

Physical Examination: Heart and lungs normal; slight tenderness noted in right lower quadrant of abdomen.

Vaginal Examination: Rather profuse vaginal discharge, not bloody. Cervix not dilated, uterus slightly movable. To the right of the uterus, a firm rounded mass felt, apparently connected with, but not continuous with the uterus. Mass not tender.

Urine examination negative.

Diagnosis.—Right-sided salpingitis with adhesions.

November 19th, under ether narcosis, a median laparotomy was performed, the pelvic mass to the right of the uterus was found to be a hæmatosalpinx, which was tightly bound down by

adhesions, the appendix being included in the mass. Left tube and ovary perfectly normal. After the adhesions were broken up, the mass which was made up of the right tube and ovary, was removed. The adherent appendix found to be very much inflamed, and was also removed, the stump of appendix first being crushed, and then turned in by means of a catgut purse-string suture.

Temperature immediately before and after operation was 98°, pulse 100. Patient did well until midnight, eleven hours after operation, when she became restless, complained of feeling faint, face became pallid, temperature dropped to 96.2°, and pulse became so weak and compressible that it could not be counted. There was no sweating. It was thought that a secondary hemorrhage had occurred, probably from the stump of the excised tube. The patient was again etherized, and the abdominal wound reopened, pelvis found to be perfectly dry, and no evidence noted anywhere of bleeding having taken place within the peritoneal cavity.

The stump of the appendix was then examined, but there was no sign of any bleeding at this region, the cæcum and colon being empty and collapsed. It was then noticed that the coils of small intestines about the umbilical region had a peculiar bluish color, were partially filled with fluid, which at the time was thought to be bloody in character. As the patient's condition was not good, no further exploration was made to locate the bleeding point or points, and before being removed from the operating table she was given intravenous injection of normal salt solution. Immediately after operation temperature was 97.2°, pulse 160.

November 20th, 5 A.M.: A little over four hours after the second operation, although still pale condition was fairly good. Temperature was 100.1, pulse 160, respirations 24. At 5 P.M. of the same day temperature was 98.4, pulse 124.

November 21st: Enema to-day brought away a large bloody stool, the blood being of a dark red color and mixed with fecal material. Later in the day passed three more stools, all of which contained blood.

November 22d: Had two stools to-day, both of which were made up principally of blood. Hæmoglobin 44 per cent., leucocytes 7250. Altogether there have been six bloody stools; unable to estimate exact amount of blood.

December 1, 1907: Eleventh day after operation, hæmoglobin 67 per cent.

December 6, 1907: Discharged from hospital to-day.

Dr. Mitchell added that during the last few years a number of cases of hemorrhage from the bowel following operations for appendicitis have been reported, the cause of this postoperative catastrophe being laid to some faulty technic of the operation. In a few of the reported cases the appendix stump was undoubtedly the site from which the bleeding came, as was proven either by secondary operation or post-mortem examination, but in the majority it was merely assumed that the bleeding came from the seat of operation.

He reported this single case to place on record a case in which the appendix was removed, the stump inverted by catgut purse-string suture, the operation being followed by severe hemorrhage from the bowel, which did not come from the inverted appendix, as was demonstrated by the secondary operation.

Dr. Wyeth¹ mentions in his paper on "Technic of Appendectomy," sixteen cases where the stump of the appendix was inverted, and which were followed by bleeding from the bowel, presumably from the stump of the appendix. In six of the sixteen cases was it clearly proven, by operation in five, and post-mortem examination in one, that the hemorrhage came from the stump of the inverted appendix. Thirteen of the sixteen cases recovered and three died.

Judd² reports an interesting case, which in many respects is similar to the case just reported. In his case the appendix was removed and the stump inverted by means of a silk purse-string suture. Eighteen hours after operation the patient complained of severe abdominal pain, and shortly afterwards passed by rectum about twenty ounces of bright red blood. During one hundred and forty-four hours succeeding the operation, passed fifty-eight ounces of blood. This patient was treated by morphine, quiet, no food, making an uninterrupted recovery, and was able to leave the hospital on the eighth day. In conclusion Dr. Judd says: "In this case the absence of any oozing from the stump was noted at the time of operation. It has always been

¹ Journal American Medical Association, vol. xlix, pp. 121-1907.

² Journal American Medical Association, vol. xlix, pp. 1843-1907.

my practice to clamp and tie with catgut any bleeding points before inverting the stump. In this case it seems incredible that such a hemorrhage should follow an operative procedure where the field was so dry, and in pondering over the subject it has occurred to me that some other explanation than bleeding from the stump is necessary to explain the cause."

I fully agree with Dr. Judd that it is most probable the hemorrhage in his case did not come from the appendix stump, but of course this fact was not proven. Its similarity to the case now reported suggests that the cause of the bleeding was the same in both cases.

It is a well established fact that bleeding from the stomach or bowels or from both, may follow any major operation. Busse³ reports fourteen cases of his own, and eighty-two similar ones collected from the literature of the subject, in which bleeding occurred from the stomach or duodenum after abdominal operation. The mortality in this series of ninety-six cases was fifty-five per cent.

The pathological changes which take place after the various abdominal operations and give rise to the bleeding, either from the bowel or stomach, have not as yet been satisfactorily explained. A number of theories have been advanced, however, to explain this condition. Mr. Moynihan in his book on abdominal surgery, states that hæmatemesis may follow any abdominal operation, but is more especially to be looked for when the stomach, duodenum or bile-passages are the seat of disease. He mentions five theories as possible causes of hæmatemesis, which may hold good to explain bleeding from the bowel after operation, as well as from the stomach.

The five theories are as follows: (1) The anæsthetic; (2) distinct injury to the stomach or bowel, resulting in ulceration from which the blood comes; (3) (Von Eiselsberg) injury to the omentum, rough handling, twisting or ligating of the omentum, producing a thrombosis of the omentum, which is followed by embolism in the walls of the stomach or bowel; (4) sepsis (Dr. W. L. Rodman's theory); (5) reflex nervous influence (Mayo Robson).

Mr. Moynihan personally believes that Dr. Rodman's theory

³ Archiv für klinische Chirurgie, 1905, p. 1568.

of sepsis is the correct one, and in support of this theory says: "This seems to me the most likely of all the explanations that have been given, though it cannot be denied that in some instances the obvious evidence of sepsis is wanting. In some of these cases it may be that the sepsis is of such a character as to produce a rapidly fatal toxæmia, the poison acting so rapidly indeed that local evidences, peritonitis, etc., have no time to develop.

Of the five theories just mentioned, that of sepsis, as suggested by Dr. Rodman, seems to the reporter to be the most feasible. In a few cases the bleeding may come from pre-existing gastric or duodenal ulcers, but in only a few instances can the cause be laid to these pre-existing conditions.

DR. ASTLEY P. C. ASHHURST said that he had never felt convinced that the majority of the cases reported by Wyeth were really due to hemorrhage from the stump of the appendix; for it has been known for some time that the French pathologists, especially Dieulafoy, have called attention to the black vomit of appendicitis. It is probable that a good many surgeons have seen this black vomit without realizing what it was. The appearance of the appendix in cases of so-called hemorrhagic appendicitis is well known. In such cases, all that can be seen macroscopically in the submucosa of the appendix is a hemorrhage of some kind. The French hold that appendicitis is merely a local manifestation of a general disease. There may be ulcerations, various sorts of ecchymoses, and erosions in other parts of the intestinal tract that pass unnoticed; and hemorrhage may come from some of these. The view mentioned by Dr. Mitchell as supported by Dr. Rodman, which regards sepsis and toxæmia as the cause of these lesions, is that on which modern ideas of pathology are based. This view was elaborated by Gandy, one of Dieulafoy's pupils, who (in his Paris thesès, 1899) showed that in all gastro-intestinal ulcerations there is some form of toxæmia; and that in all forms of toxæmia there is gastro-intestinal ulceration. Gandy traced in different diseases the various stages of the ulceration up to the well-formed ulcer, in which there may be either hemorrhage or perforation. Dr. Ashhurst therefore believes that it is the theory of sepsis and toxæmia upon which the pathology of this complication must be based. He has recently read in the *Lancet* an article by Hort, in which the claim is made that gastric ulcers and similar lesions are due to hæmorrhagins

and mucolysins. The writer also claims to have been able to produce these lesions experimentally in some of the lower animals; and to have cured them with antivaccines and serums, both in the lower animals and in patients. This shows that toxæmia must be the cause of these lesions.

DR. JOPSON said that while Dr. Ashhurst's explanation of the theories as to the cause of hemorrhage after appendectomy would be plausible in cases of acute infection, they would scarcely explain cases that come on after interval-operations and within such a short time that sepsis would not have a chance to be an active feature. If one operates between attacks and the patient has hemorrhage from the bowel eight or ten hours after the operation, one is inclined to ascribe it to the operative technic. While Dr. Jopson agreed with Dr. Ashhurst that perhaps the majority of these cases are not due to hemorrhage from the seat of the appendix, he thought that a certain number must be. Studies in anatomy have shown the occasional presence of an abnormal vessel at the base of the appendix which might easily escape a purse-string ligature, unless most carefully applied. Although Dr. Jopson has continued to use this method of ligation with inversion of the crushed stump, he has been careful to pass the ligature under the site of such a potential vessel at the base of the meso-appendix, so that it could hardly escape the grasp of the suture. This he considers a point of great importance. If active hemorrhage is present, after one cuts the crushed appendix, one should throw a ligature about it. The ideal method is complete excision and the application of the through and through hæmostatic suture, such as is used in gastro-enterostomy, followed by another continuous Lembert suture. One could not, however, venture to recommend this procedure to a large class of surgeons who are doing satisfactory operations by other methods. Nevertheless, it is the ideal method, anatomically speaking.

Dr. Davis asked whether the appendix had been crushed first and then inverted with a single purse-string suture, and remarked that a blood-vessel might enter the appendix between the loops of the purse-string suture and so escape constriction. If no circular ligature were applied, part of the circumference would be without pressure. For this reason, in cases in which no circular ligature was applied, the technic might have had something to do with the production of hemorrhage.

GASTRO-INTESTINAL HEMORRHAGE FOLLOWING RADICAL OPERATION FOR HERNIA.

DR. W. E. LEE reported the case of a white male, who was referred to the Pennsylvania Hospital for radical treatment of two inguinal herniæ. As railway engineer, miner and prospector he had been accustomed for many years to severe physical work. During an illness of several months in his seventeenth year he had general anasarca but there was nothing else in his history which had any relation to his present hernial condition.

The examination showed an unusually well developed and well nourished man with heart, lungs and urine negative. The right hernia appeared twenty years ago and had since been imperfectly supported with a truss. Seven years ago iodine injection treatment had been tried with negative results. At the time of admission there was an easily reducible scrotal mass about the size of a lemon.

The left hernia, which was of six years' duration and had been supported in a similar way with a truss, could just be felt at the left external ring.

Under ethyl chloride and ether anæsthesia the hernial sacks were ligated at the internal rings and excised, then the inguinal canals were reconstructed after Bassini's method.

During the following twenty-four hours he developed abdominal pain and slight distention, which were not relieved by free purgation, and toward evening he began vomiting a clear colorless fluid. The vomiting continued and the distention increased during the following day and fifty-four hours after operation he suddenly vomited 350 c.c. of dark fluid blood, after which the vomiting ceased. Twelve hours later and following a high alum enema he passed from the bowel 500 c.c. of blood very similar in appearance to that which had been vomited. There was no more evidence of blood in the stools and his recovery was uneventful.

It seems safe to assume that this hemorrhage was in no way the direct result of any operative procedure for there was no handling of any part of the gastro-intestinal tract. Numerous similar cases of postoperative hemorrhage of obscure origin are on record, and although the majority of them have followed abdominal operations they occur after operations upon all parts

of the body. Appearing usually during the first twenty-four hours, they may occur as late as the tenth day.

Various suggestions have been made as to the etiology. The fact that such hemorrhages are reported after operations with cocaine anæsthesia and even without any anæsthetic seems to discredit the anæsthetic being the cause. Trauma of the gastro-intestinal tract from the operative intervention is not to be considered in this case, for, except the gentle replacing of the coils of the small intestine as they appeared at the internal rings during the ligations of the sacks, there was no handling of the gastro-intestinal tract. Thrombosis of the arterial or venous systems with secondary embolism in the walls of the stomach and duodenum is suggested by the finding, post-mortem, of erosions and ulcerations in the organs. These lesions, however, are not constant and have only been found in a small number of the cases.

Sepsis, considered by Rodman to be the cause in a large number of cases, can also be eliminated in this instance, for there was no sign of any infection.

The prognosis seems to be very grave; in 96 cases collected by Busse there was a mortality of 55 per cent., while Purves reports 72.5 per cent.

The treatment is necessarily symptomatic. Morphia to quiet the movements of the gastro-intestinal tracts; gelatin by mouth or subcutaneously to increase the coagulability of the blood; and saline infusion to replace the lost blood have all proved useful.

TRAUMATIC CEREBRAL HEMORRHAGE.

DR. GWILYM G. DAVIS reported the case of a woman, aged 34, who was brought into the Episcopal Hospital in an unconscious condition. It was ascertained that on the day of the injury she had been on a visit to her sister and had drunk freely and later started for home evidently under the influence of liquor. While on her way home she fell and struck her head on the pavement. She was taken to the police station and thence sent to the hospital. On admission her temperature was 99°, pulse 88, respiration 24. Patient was dull, heavy, stupid, almost in coma. She seemed to be sleeping soundly but could with difficulty be aroused. The mouth was open and tongue dry. There was some

hemorrhage from the left ear and contusions of the nose, but no other apparent evidences of injury. There was a slight inequality of the pupils, the left being somewhat the larger. No paralysis of the extremities. Pulse full and strong; urine 1020; acid and slight trace of albumin; no sugar. Three days later she could be roused sufficiently to talk a little, but her mind was not clear. She fed herself with the left hand, but moved the right slightly. During the next ten days her mind became clearer, and her temperature normal and while much improved in her general condition the partial paralysis of the right arm persisted.

On the 14th day she was not so well and her temperature rose to 99.8°. The next day she was found almost comatose with a temperature of 100° and a full, strong pulse of 60 to the minute. The right pupil was dilated more than the left. She was immediately removed to the operating room and trephined on the left side below and in front of the parietal eminence. The dura bulged into the opening and looked congested, but showed no pulsation. On opening it no evidences of clot were discovered. She was turned on the other side and the trephine applied below and in front of the right parietal eminence. There was no pulsation, but on opening the dura a large clot was found. This was scooped and washed away, leaving the brain apparently normal. The dura was sutured, a wick drain inserted and both wounds closed. On the following day the drain was removed. Her temperature rose to 102° and her pulse to 132. On the 2d day after the operation she could be aroused and understood what was said. Her pulse improved and her temperature began to decline. On the 4th day her mental condition was improving, her temperature was nearly normal and she began to move her right arm. She continued steadily to improve and was discharged six weeks after the operation, cured. Her mind was clear and she had fully recovered the use of the right arm. This case was not operated on earlier because of the lack of localizing symptoms at the time of her admission and her subsequent steady improvement. Previous to the day of operation the localizing symptoms were bleeding from the left ear on admission, a slightly larger pupil on the left side and two or three days later a partial paralysis of the right arm. These symptoms all pointed to a lesion on the left side of the brain. On the day of operation, however, the right pupil was the larger. In view, however, of

the persistent right-sided paralysis and history of bleeding from the left ear it was decided to explore the left side first. The opening was so placed as to allow it to be extended forward if necessary and allowed of the areas of both the anterior and posterior branches of the middle meningeal artery to be reached. The paralysis as well as the absence of pulsation when the skull was opened showed that the left side of the brain was affected; whether it was by the direct concussion from the injury or by transmission of pressure from the right-sided effusion is a question. From the fact, however, of the paralysis not being noted until the 2nd or 3rd day after the injury we believe it to have been secondary and due to transmitted pressure. The fact of the clot being found on the right side shows that the dilated right pupil was a better index of the locality of the lesion than the partial paralysis of the right side. Traumatic cerebral hemorrhages whether epidural or subdural are most likely to occur at the site of impact. If, however, they are not found there then, as shown many years ago by Dr. Formad, they are found on the opposite side. While cerebral hemorrhages (clots) are very commonly the result of contrecoup cerebral fractures are rarely so and even when present are apt to be insignificant in extent. These hemorrhages by contrecoup are most likely to be subdural, although it is probable that in some rare instances they may be epidural or between the dura and the bone.

DR. A. P. C. ASHHURST said that during the last few weeks he had seen, at the Episcopal Hospital, a case under Dr. Neilson's care, who was struck on the right side of the head during a fight, and was brought to the hospital in a semi-conscious condition. He was treated for fracture of the base of the skull. Dr. Ashhurst did not happen to see him again for several days, when he noticed that he was having twitching convulsions of the right forearm and both lower extremities; but the left arm was not moving at all. The right pupil was widely dilated, and pressing upon the supra-orbital nerve elicited facial palsy on the left side, very marked. Dr. Ashhurst had thought that it was a case of extradural hemorrhage. The patient grew worse and died, and at autopsy a fracture of the skull involving the base and a subdural hemorrhage were found, as in Dr. Davis's case. The dilated pupil was on the side of the lesion, the right side, as also in Dr. Davis's case.

REMOVAL OF THE LINGUAL AND MANDIBULAR NERVES
BY THE TWISTING METHOD OF THIERSCH.

DR. GWILYM G. DAVIS reported the case of a woman, aged 47, who applied for the relief of a neuralgia affecting the tongue and lower jaw. The pains had begun five years previously, they were intermittent and affected chiefly the left side of the tongue and cheek down to the angle of the jaw. The paroxysms became frequent and severe, coming on most often in the morning when arising from bed. Sometimes, though rarely, she would have attacks at night. The pupils reacted normally and the tongue when protruded would deviate slightly to the right and was tremulous. She was otherwise well. The following operation was performed: An incision was made beginning about a centimetre below the ear and carried down behind the ramus and angle of the jaw and forward along the under side of its edge to just forward of the anterior edge of the masseter muscle. With a periosteal elevator the soft parts were detached from the bone and turned upward. The jaw was cleared off upward until the coronoid notch (*incisura mandibulæ*) was reached. A half inch trephine was then placed midway between the notch above and the lower edge of the jaw below and a button comprising the outer layer of compact tissue removed. The bridge of bone between the trephine opening and notch above was removed and the canal opened by means of a chisel downward until near the mental foramen. The mandibular nerve being thus exposed was lifted from its bed and displaced upward. (Fig. 1.) The bleeding from the accompanying artery was controlled either by ligation or packing. The trephine was then again introduced and another button of bone comprising the inner side was removed. With a forceps a considerable amount of fat was taken out and the lingual nerve exposed lying almost directly beneath on the internal pterygoid muscle. With a curved, long jawed, hæmostatic forceps introduced through the trephine opening both nerves were grasped, being lifted by a blunt hook until they were well up from the end of the forceps. The forceps were then slowly turned, not faster than one turn in a half minute or more. It took 13 minutes to complete the removal of the nerves.

The wound was packed with gauze and closed with sutures. The gauze was removed on the second day and the stitches on

the fourth and the wound closed by primary healing. This mode of removing peripheral nerves by torsion very slowly applied was devised by Thiersch (Verhand. der Deutschen Gesellschaft für Chirurgie, 18th Congress, Berlin, 1889, p. 44).

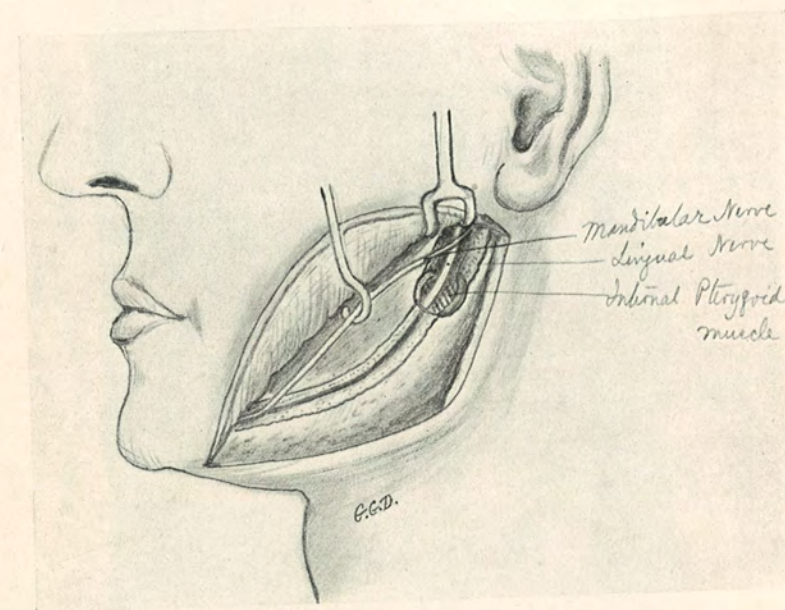
Angerer (Archiv. für klinische Chirurgie, Bd. 53, s. 179) gave the results in 26 cases; of these 2 changed to some other branch, 7 returned and 17 remained free, 16 had been operated on for more than 4 years. Of these three were reoperated on and one died of intercurrent disease. Of the remaining 12, three had a return of the pain and seven remained free.

Dr. Davis further remarked that these results are so much better than those in which only small portions of the nerve are removed as to demonstrate its superiority and necessitate the abandonment of the latter. The Thiersch method can be successfully employed for the supra- and infra-orbital, the mandibular (inferior dental) and lingual nerves. It seemed to him to be decidedly preferable to the operations devised by Kocher, Horstley, Lücke, Pancoast, Minter, Carnochan, and many others. The lingual nerve if alone involved can be readily removed by the Thiersch method through an intrabuccal incision, but to attempt the removal of the mandibular (inferior dental) nerve through the mouth by the method of Paravicini is a delusion and a snare.

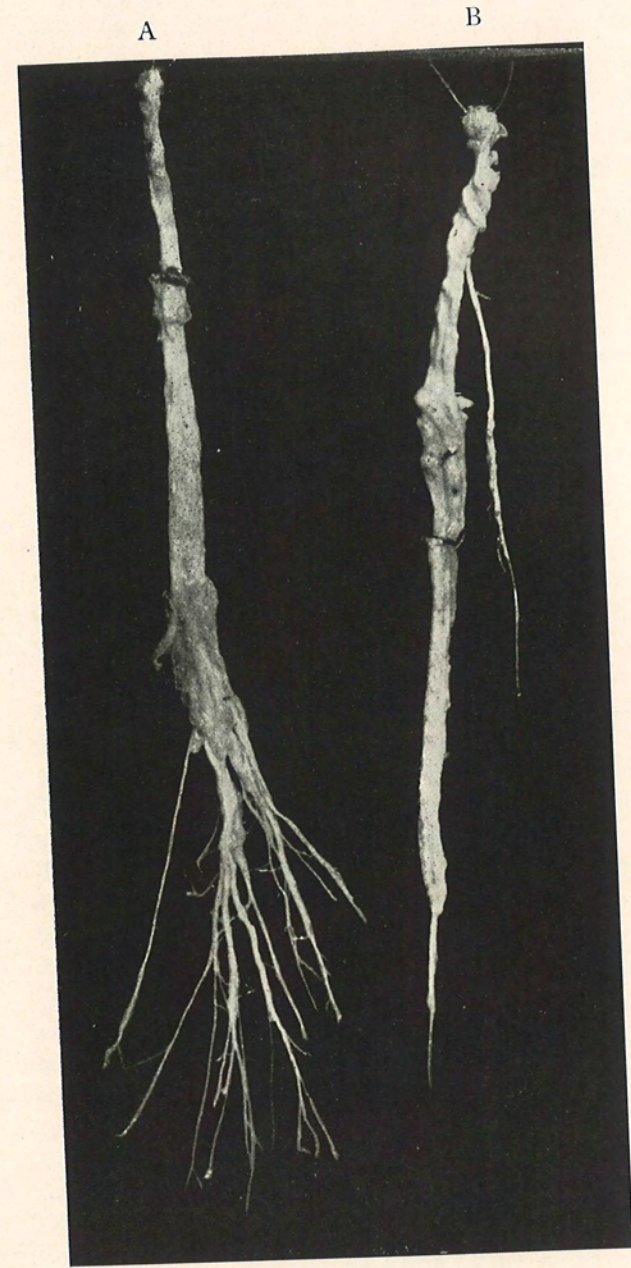
The disfigurement arising from an incision along the posterior and inferior edges of the jaw will be but slight if the subcutaneous tissues are first brought together with catgut sutures and then the skin united with the subcutaneous suture or very fine interrupted sutures removed by the 4th or 5th day. In the case reported the bone between the trephine opening and incisura above was removed in order that the mandibular nerve could be raised up out of the way in order to complete the section of the bone and allow access to the lingual nerve below.

The length of the lingual nerve removed was 15 cm. (6 in.) and that of the mandibular 12.5 cm. (5 in.) (Fig. 2.) Had the bone been removed and the dental canal opened clear down to the mental foramen as should have been done then more of the latter nerve could have been removed. The commencement of the incision from below the ear to the angle of the jaw is to be carried only through the skin and subcutaneous tissue; the parotid gland lies beneath and it should not be incised but dragged upward out of the way. There is a great tendency for the nerves to slip

FIG. 1.



Operation for the removal of the lingual and mandibular nerves, by torsion.



A. Lingual nerve. B. Mandibular nerve. (Natural size.)

off the end of the forceps. To avoid this Dr. La Place suggested the use of a slender pair of long jawed curved hæmostatic forceps. Their use was found to be perfectly satisfactory in this case.

The area of anæsthesia produced by the operation embraced the left half of the tongue and the floor and outer wall of the mouth. The roof of the mouth, palate and upper alveolus were sensitive. Taste was lost on the left half of the tongue until its base was reached just in front of the circumvallate papillæ. On the outside of the face sensation was lost anteriorly in a line starting at the upper anterior edge of the pinna and passing downward and forward to the angle of the jaw; posteriorly the line extended from beneath the lobe of the ear, along the line of incision, to the middle of the chin. The patient is still free over a year since the operation.

Pathological Report.—A microscopical examination of the excised nerves by Dr. Geo. P. Müller revealed nothing except a slight proliferation of the neurilemma.

DR. MORRIS BOOTH MILLER recalled an experience that he had had about a year ago. In this case, Dr. Miller attempted to do an inferior dental nerve avulsion and at the same time he wished to avoid the disfiguring scar on the outside of the face. The method followed was first used by Paravicini, who suggested that the inferior dental nerve might be attacked through the mouth. Dr. Miller had a good deal of difficulty in performing the operation. The idea of avoiding any scar appealed to him, and he finally succeeded, but he had great trouble in reaching the nerve. He had thought that the spine of Spix and the internal lateral ligament would be landmarks more easily reached and identified than it proved. He caught a nerve and, after having pulled on it with a certain amount of force, he found that the tongue twisted with the twisting of the nerve. He therefore recognized that he had the lingual nerve, which was not involved. Fortunately, he had discovered his mistake in time to avoid damage. After a good deal of difficulty, he succeeded in getting out the proper nerve, but he would never undertake this method again. He considers the operation used by Dr. Davis the only correct one in reaching the inferior dental nerve, but the lingual can be reached more easily by the intrabuccal route. In working through the mouth, however, it is hard to get light and there is not much room for the finger or instruments.

DR. JOSEPH M. SPELLISSY asked Dr. Miller whether there had been any return of the neuralgia in the case in which he had operated through the mouth.

DR. MILLER replied that the neuralgia partially returned some time after the operation.

DR. GEORGE P. MÜLLER said that he had done a number of these operations always removing the inferior dental nerve through an incision made along the angle of the lower jaw without having much of a scar, if the wound was closed by a subcuticular stitch. In two cases the incision divided the lower lobules of the parotid gland, and in one of these some trouble was experienced afterwards in closing a small salivary fistula. On one occasion he had removed almost as much of the nerve as in the specimen shown by Dr. Davis by trephining the angle and dividing the inferior dental nerve in the usual manner, and then, by means of a second incision, pulling it out of the jaw through the mental foramen and then twisting in the usual manner. The greatest difficulty he has encountered in these operations is to keep the nerve on the hæmostat while twisting. He uses a blunt hook to hold the nerve, keeping one hand on the hook, and the other twisting on the hæmostat. After having twisted the nerve three or four times and thereby loosening it, he allows it to untwist again and takes a more secure grasp with the hæmostat. The turns should be made very slowly.

DR. DAVIS, closing, said that the operation is such a radical one so far as the amount of nerve that is removed is concerned and the fact that at least seven of the fourteen cases remained permanently cured makes it the procedure of choice when a peripheral operation is decided upon.

Regarding Dr. Miller's remarks in reference to the intrabuccal procedure, Dr. Davis said that the operation was that of Paravicini and was described in Bryant's "Operative Surgery." The lingual nerve is very readily reached beneath the mucous membrane immediately behind the last molar tooth, where it crosses obliquely toward the tongue, but to reach the inferior dental by the intrabuccal method, however, is quite another question. It is very deep and close to the inner side of the jaw. Going upward and inward from the angle of the jaw, one meets the internal pterygoid muscle. Between this muscle and the jaw there is a chink in which the nerve and the artery are found; the

muscle also is attached to the jaw with the spinamandibular ligament above it. The spine of Spix may not be perceptible to the sense of touch, for the finger will run along the jaw and over the spine to the ligament, which is in front of the nerve and the vessel. To reach these, one must get rid of the ligament. If it is cut, one is liable to cut the nerve, because it is so close. If you hook it forward and cut it, you can reach the nerve and artery; but the inferior dental artery will probably be cut, and as it is a good-sized artery its bleeding will obscure things. If, however, it does not bleed, and you proceed to take out the nerve, the distance between the lower part of the skull and the jaw is so slight that it would be difficult to remove the nerve thoroughly, on account of the difficulty in manipulation.

Dr. Davis does not believe in any of the operations on cranial nerves that require one to work through too small an opening, because too little of the nerve is removed; for instance, the operation on the inferior dental through the mouth, or the operations through the zygomatic fossa in the temporal region on the maxillary and mandibular branches of the fifth nerve.