

Boston, May 15 - June 2nd, 1923

Report of Trip.

- I. Clinic of Dr. Harvey Cushing, Peter Bent Brigham Hospital.
- II. Pathological Laboratory of Dr. F. B. Mallory, City Hospital.
- III. Celebration of 10th year since foundation of Peter Bent Brigham Hospital.
- IV. Meetings of American Neurological Society.

1. Organization of Surgical Clinic.

General.

Surgical internes appointed for 14 months. (No medical rotation).

In addition to the usual house officer activities, 3 or 4 months are spent in the Out Door Department. For half of this period the interne sees patients from 9 A.M. till 5 P.M. in general surgery and is on call for all emergency admissions at night. For the other half of this period he has his mornings free and works in the G. U. Clinic in the afternoon. During this time of free mornings and evenings the men study x-ray or some other specialty or very often begin a piece of research.

Two assistant residents and one resident. The last does a great deal of operating with most of the night work. The assistant residents assist at operations and get a little operating and they are expected to do research in the Surgical Research Laboratory.

Attendings - Dr. Cheever and Dr. Homans alternate in charge of the general work of the surgical wards. They have their offices in the private patient building basement and have private patients there the year round.

Dr. Cutler has his office in the Surgical Dispensary and is responsible for the conduct of the dispensary. All attendings have one afternoon a week to see patients here. Dr. Cutler acts as Secretary or Executive Officer to the Department of Surgery. He has private patient privileges and occasionally does ward cases.

Genito-Urinary. Dr. Quinby is in charge of the G.U. work. His office is in the dispensary adjoining the G.U. clinic. Here he sees private and clinic patients. He has a G.U. assistant resident who runs the clinic with his supervision, does cystoscopies, supervises ward patients and operates or assists Dr. Quinby.

Neurological. Dr. Cushing has his offices, that of his artist and photographer and a large neuro-surgical pathology laboratory beneath the operating rooms. Neurological patients are scattered through the general wards. Histories and general physical examinations are done by the ward men. The histories on private patients and neurological examinations on all patients as well as a complete summary on all cases - are done by the Neurological Assistant Resident, who is at present Dr. McKenzie from Toronto. Patients seen by Dr. Cushing in his office are usually examined first by Dr. Horrax, who in addition to helping in the office, thus operates on a certain number of cases who are from one division and supervises patients on that division. Dr. Bailey supervises ward patients on the other division, occasionally operates, and on occasion assists Dr. Cushing to operate. Most of the first assisting is done by the assistant resident however.

The neuro-pathological laboratory is placed between Dr. Cushing's office and the general Pathological Laboratory of Dr. Wolbach is being developed by Dr. Bailey. Here he and Dr. Cushing are working up the vast harvest of pathological material which has fallen under Dr. Cushing's scalpel. They have a technician and are securing another one and expect a Swedish research worker to join them. They are trying to get a young Spaniard to come over to this country from Cajal's Laboratory in Madrid to teach them some of the Spanish histological procedures. Dr. Bailey has been made an Associate in Surgery on a full time basis. He has developed a successful glia stain.

Operating Room. There is a head nurse and permanent assistant and a graduate scrub up nurse for neurological operations. For other operations student nurses scrub up. The three operating rooms are across a hall from the anaesthesia

sterilizing, stock and instrument rooms. At the end of the hall are several small recovery rooms where hypodermoclyses are administered. The instruments are selected, boiled and laid out by an interne, the instrument man. Preparation of the hands - scrub in soap and water 10 minutes, wash in alcohol and bichloride (the bichloride soak has been given up) and put on gloves in 1-5000 bichloride. Most of the attendings put on gloves dry or in water. Preparation of the patient is by alcohol sponges in the bare hands of the assistant followed by bichloride sponges. The skin in every instance is kept covered during the operation. During operations there is usually a graduate "dirty" nurse present in the room ready to get what is wanted or to direct the "scrub up" nurse. Sterile things are brought in by her with long sterile forceps.

Special Surgical Procedures.

Suboccipital craniotomy for cerebellar tumor. (3 operations seen.)

The patient enters room in bed and is lifted face down on to the operating table. The anaesthetist sits on a standee below her and in front of her head. Patient is anaesthetized by blowing ether into wet towel funnel fastened about her face and then an intrapharyngeal tube is placed and anaesthesia maintained by a Connell machine. The patient's face rests on a horseshoe shaped head rest and extension of the neck is secured by tension of a retractor on the scalp in the hands of an assistant.

The details of the whole operation are recorded in my notes together with illustrative sketches. This operation as well as all the others in Dr. Cushing's hands have become standardized, the opening and closure being always done the same way. He considers this the most difficult and dangerous operation in neurological surgery.

He uses a cross bow incision. The greatest care is given to the reflection of the muscle so as to provide for accurate replacement of the muscle and overlying fascia. He uses a motor driven burr to enter the skull for this

and all other operations. This machine has the advantage of not tiring the operator and saves a small amount of time perhaps. He usually taps the lateral ventricle through a separate trephine hole before opening the dura and leaves the needle projecting out all through the operation. On one occasion I saw this needle inadvertently driven farther in. Closure takes an hour or more, the whole operation being between 3 and 4 hours in duration. All sutures are of fine silk interrupted and tied in a triple knot everywhere except in the last skin layer. Two layers in muscle, one in fascia and two in skin. The wound is covered with silver foil. The patient is left prone on the operating table until fully conscious. This would seem a dangerous procedure because of the patient's tendency to lift the head and break out the muscle sutures. This did occur in one case which had to be resutured a week later.

Transfrontal bone flap for approach to supracellar tumors. The skin flap is carried well over to the midline of the forehead and goes very little above the hair line. The bone flap likewise is carried very close to the midline and down so far that in the case which I saw the frontal sinus was opened. He used a motor driven burr for making the holes in the skull, which are placed rather far apart, and the Gigli saw is passed on 2 flexible strips of metal, one of which protects the dura and the other carries the saw thru. This is handled very well and seems to be an improvement over the methods used by Dr. Frazier and Dr. Elsberg. An excellent exposure is obtained largely because of the fact that the bony opening comes down quite flush with the roof of the orbit. The temporal lobe can be re-elevated then and a good exposure obtained of the optic chiasm. I saw him by this exposure evacuate a good sized cyst thru the limbs of the optic chiasm, the cyst lying well back in the interpedunculated space. He uses now a suction tube to clear the field of operation of escaping fluid or blood. This works very well indeed. Dr. Cushing still uses the transphenoidal approach on certain cases,

especially those where there seems to be a lesion well down in the pituitary fossa. The advantage of this approach in certain cases is that after a partial removal, a second operation can still be done when symptoms recur by the trans-frontal route, whereas after one transfrontal operation, a second one becomes almost impossible.

Parietal Bone Flap. I saw several large bone flaps done. The openings are made by the motor driven burr and the bone cut out with the Gigli saw. Dr. Cushing does not use any clamp for the base of the flap but places hemostats on the galea of the scalp flap. The application of his hemostats and their subsequent handling requires a good deal of time and is rather awkward. He sometimes removes the bone from the scalp flap when he cannot close the dura after an exploration, but tries to replace the flap if possible. The closure here as in all other operations is done with exceeding care with fine silk. The bone flap is not fastened with silver wire to the surrounding skull as Dr. Dandy does it.

Casserectomy for Trigeminal Neuralgia. The usual curved incision is made beginning just anterior to the ear and the bone on the under surface of the lateral aspect of the frontal lobe is rongeured away. He deals with the meningeal artery by means of silver clip and places wax in the bony opening of the artery but never uses a peg for this purpose. The dura is dissected off on the third division of the nerve and an attempt made to free it from the motor division. He does not use Dr. Frazier's electric light retractors and the exposure is not very good. The result is that he frequently divides the motor root with the sensory roots as happened in a case which I saw him do. In discussing the approach with him he advises my using Dr. Adson's approach rather than the one that he uses. Dr. Adson splits the dura over the sensory root well back on the ganglion, thus getting a better exposure. In Dr. Cushing's experience the occurrence of trifacial neuralgia on the other side is not

infrequent. If the motor root has been destroyed one would hesitate to attack the other side for fear of destroying the motor root on that side also.

Subtemporal Decompression. Dr. Cushing still uses this operation in certain cases where he cannot make a diagnosis, to save the sight. He also uses it as an approach to a tumor in the temporal lobe at times. He feels very strongly that the criticism of this operation is unjustified. He does it in a short time and there is almost no reaction to the operation. This was certainly true of a case that I saw. After making a subtemporal incision and splitting the fibre of the temporal muscle, the bone is removed well down to the under surface of the temporal lobe. He of course does not close the dura but closes the muscle in 3 layers carefully with fine silk. The fascia is then closed and 2 layers are placed in the skin as usual. In a case which I saw him do the exploration was negative and the history very suggestive of a vascular disturbance rather than tumor. However the man was out of bed and feeling perfectly well on the third day.

Postoperative Treatment. The crinoline bandage is used in all cases except for suboccipital craniotomies. In these cases a very large head bandage and neck bandage are put on and the neck fixed so that it cannot be moved, with a plaster splint. Vaseline gauze is put back of the ears as well as cotton to prevent discomfort from pressure here. The suboccipital is left, has has been said, face down until he has fully recovered. This is done for fear of embarrassing his breathing when he is placed on his back in bed. It would seem however that the danger of tearing out the muscle sutures when the patient tries to raise his head in this position would more than offset this consideration. Silver foil is used on all wounds. For ganglion or transfrontal cases the stitches are sometimes cut in 12 hours and removed in 24 or 48 hours. Stitches are left in the suboccipital cases 9 days and also in bone flaps where there is no considerable pressure upon the flap. Hypertonic saline has been used occasionally after

operation to reduce edema, but is more frequently used before operation to rouse a comatose patient, which it does quite well. Rectal saline is given routinely to all these patients. No stimulating medication whatever is given to the patients during operation. Blood pressure ratings are taken by the anaesthetist at regular intervals during the operation and are charted on the anaesthesia

chart together with the pulse and respiration. Transfusions are given after operation when indicated. Patients are placed with their heads at the foot of the bed so as to facilitate dressing. There is no special preoperative preparation except for a very careful shave which is done by the assistant resident or occasionally by the operating room orderly.

Cranial Pneumography. Although Dr. Cushing feels that he has gotten very little help from the cranial pneumographs, he is doing quite a good many of them. The pneumographs are done by Dr. Horrax, Bailey or McKenzie. Patient is placed upon his back and a trephine opening made just off to the midline about on a level with the parietal eminences. Only one trephine opening is made. A ventricular needle bearing small rubber tube is then inserted thru the dura with the scalp incision gaping. The needle is inserted horizontally thus reaching the posterior horn of the lateral ventricle. Fluid is allowed to escape until it stops running and then air is injected and fluid again allowed to escape. This is repeated until air returns. In this way the operator does not know how much air has been placed in the ventricles, and the pressure in the ventricles is atmospheric at the end of the operation. Making this opening is much more convenient than the occipital opening of Dr. Dandy.

On the other hand there seems to me to be more danger of striking an unsuspected tumor here than in the occipital lobe, where a careful visual field practically rules out a tumor. Some effort was made to suck the air thru cotton, but as a bulb syringe was used for the air and merely applied to a piece

of cotton this was not very efficient. Patient was kept on his back and the operator accompanied him to the x-ray room after the needle had been withdrawn and his incision closed. The lateral plates were taken with the patient on his back so that the head had to be raised on a pillow about 3-4 inches off of the plate which is an unnecessary handicap when the patient might be placed prone. The x-ray plates were certainly no better than the ones taken here, although a comparison was difficult to make. They do not make a custom of removing the air after the pneumograph, and they have had some very serious reactions with vomiting, headache, coma, etc. After the appearance of these symptoms they have not infrequently attempted to remove the air. It would seem that the custom of routinely removing large amounts of air before the appearance of distressing symptoms is a good one.

In general the recovery of patients after brain operations is remarkably smooth, healing of the wound almost perfect, and the whole neurological service seems to be running with the utmost smoothness and efficiency. One is impressed by the fact that the principle interest of those in the clinic is in the various types of brain tumor. Very little time is found for the study of hydrocephalus, and very few spinal cord tumors appear in the clinic. 4 laminectomies were performed last year, according to the catalogue report. No work is being done on epilepsy or the physiological aspects of intracranial lesions. The slowness of Dr. Cushing's operating does not seem to keep the patients under ether too long; the average operation is more than 3 hours. The loss of blood is reduced to a minimum, the greatest care being taken to prevent bleeding in the scalp, bone or brain. The brain is handled very gently. The amount of shock which the patients exhibit after these long operations is no greater than that shown by Mr. Sargent's patients at the National Hospital, his operations rarely exceeding 1 1/2 hours in length, but the blood loss by Mr. Sargent being very much greater. The postoperative course of Dr. Cushing's patients is infinitely smoother.

11. Pathological Laboratory of Dr. F. B. Mallory, City Hospital, Boston.

A complete series of brain tumors in the laboratory was studied. The sections of dural endothelioma upon which Dr. Mallory based his recent paper, and which decided him to call this tumor arachnoid fibroblastoma, was most interesting. His phosphotungstic acid stain shows clearly that these tumors are made up of fibroblasts, inasmuch as one can see the fibroglia fibrils very distinctly as well as collagen and occasional elastic tissue. These fibrils can be seen also in the cells of the arachnoid nests which normally invade the dura near the longitudinal sinus. I was convinced that it would be better to call these tumors fibroblastomas, and they do apparently arise from the arachnoid, as has been suggested by others. After drawing many different sections of glioma, it was impossible to separate out any particular types of glioma with the phosphotungstic acid stain except that there were 2 or 3 cases which showed the frequent formation of alveoli or crypts lined with cells which resembled the cells of the central canal or ependyma in one case. This tumor seemed to be arising from the ependyma over the choroid plexus. This may have been an ependyma glioma which Dr. Bailey has worked up as a class from Dr. Cushing's set of gliomas.

111. Celebration of 10th year since the Foundation of Peter Bent Brigham Hospital.

For 3 days papers were read by various former and present members of the staff on a wide variety of subjects. There were a number of social functions mixed in with the reading of the papers. It was attended by a large number of the former staff. I read a paper on the Relation of Extracranial Infections to Meningitis Serosa.

1V. Meetings of American Neurological Society.

The meetings were held at the Brigham Hospital, Dr. Cushing being President of the Society this year. Some of the papers were of great interest. Dr. Cushing presented a series of baffling cases which he happened to have on