The immediate cause of the abscess was never ascertained. Doubtless the attack, like the preceding ones, was due to the temporary impaction of a stone in the common duct. The peritoneal abscess may have been caused by perforation of the duct by the stones, in which case it must have been dissolved in the pus. The improbability of this explanation is rendered greater by the facts that the pus was bile stained only to the same extent as were the peritoneum and tissues of the abdominal wall, and that no bile ever appeared in the sinus after the operation. More probably the cause of the abscess was septic absorption, or rather penetration at an ulcerated spot at the seat of impaction. According to Naunyn, *B. coli commune* is generally found in the stagnant bile in cholelithiasis both in the bladder and ducts, and may give rise to cholangitis and cholecystitis. Its penetration of the wall of the duct at the damaged spot would be merely a repetition of its not infrequent behaviour in intestinal ulceration.

The stone was probably passed into the bowel two days before the patient was seen, when the pain ceased, the obstruction, however, being maintained by the pressure of the abscess.

A PRELIMINARY NOTE ON THE GOLGI IMPREGNATION OF FORMALIN- HARDENED BRAIN.

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THE investigation, of which the present account is a preliminary notice only, was commenced some months ago in order to ascertain a method of performing Golgi impregnation on brains which had been hardened whole in 5 per cent. formalin.

Excepting a statement by Schäfer¹, that previous hardening in formal does not interfere with Golgi's method, I have been unable to find any reference to the subject in the recent literature. Mixtures of formalin and bichromate have, however, been recommended by Strong,² Durig,³ Kopsch,⁴ and Fish⁵, and of Müller's fluid, formalin, and osmic acid by Fish⁶, as substitutes for the osmium-bichromate mixture of Golgi's silver-chrome process.

I have obtained the best results from the brains of cats and half-grown kittens, which, after preliminary washing to remove blood, had been placed in 5 per cent. formalin five weeks previously. I have, however, had nearly equally good results from brains that have been in formalin for as long as four months. Impregnation can also be obtained in adult human brains that have been in formalin for six months. On the other hand, I have obtained poor results, or none at all, from brains, even when small, that have been hardened from three to seven days only. In the last cases the real hardening process, though apparently complete, was probably not so.

The pieces of brain used should be not larger than a quarter of an inch square and one-eighth of an inch in thickness. Ammonium bichromate is the best chrome compound, used in strengths of from 0.5 to 2 per cent., and the most satisfactory time for the bath is one to five days. Potassium bichromate of the same strength and Müller's fluid give nearly equally good results, but the impregnation is usually not so black, and the tissue tends to be stained yellow. Chromic acid and chrome alum give no result, although the latter in my hands gives more successful Weigert-Pal preparations than those obtained either from the chromates or from any other salt of a heavy metal. This is evidence in favour of the Golgi stain being, as is now supposed, a compound of silver with CrO_3 , whilst the Weigert-Pal logwood lake is due to interaction between hæmatoxylin and a salt—or osmium salt—of one of the heavy metals.

The strength of the chrome bath, and the length of time it is used, very much influence the degree and kind of impregnation. A 5 per cent. solution in four days prevents the process, as does a weaker solution after a proportionately longer interval. This probably explains why Van Gehuchten⁶ has not obtained good results from the substitution of formalin for osmic acid in the normal Golgi process.

I find that a 1 per cent. solution of silver nitrate is better than a 0.5 or 0.75 per cent. The silver bath should last twenty-four hours, except in cases where Müller's fluid is used, when it may advantageously be continued a second day. Formic acid is unnecessary, and causes a too rapid precipitation of silver chromate.

REFERENCES.

- ¹ *Practical Histology*, 2nd edition, p. 154. ² *Anatomischer Anzeiger*, 1895, p. 494. ³ *Ibid.*, p. 659. ⁴ *Ibid.*, 1896, p. 727. ⁵ *Proc. Amer. Mic. Soc.*, 1895, p. 319. ⁶ *Bolles Lee's Microtommists' Vade-Mecum*, 4th edition, p. 428.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, ETC.

PNEUMOTHORAX: REPEATED PARACENTESIS: INCISION: RECOVERY.

C. J., a publican, aged 34, had left pleurisy in April, and again in August, 1896. Severe cough followed the second attack. In January, 1897, he consulted a London physician, who said there was commencing disease at the left apex, and sent him to Torquay. His cough, which was most violent and distressing, persisted until the middle of March. After its disappearance he rapidly improved in general health, and put on flesh, gaining over 2 st. in two months. I saw him for the first time in June, and beyond some slight emphysema could detect no evidences of lung disease.

On July 29th "he felt something give way in the right side" on turning in bed. Difficulty in breathing and pain in right hypochondrium and epigastrium followed. Signs of pneumothorax were detected the next day.

On July 31st, at 11 P.M., dyspnoea was so urgent that I punctured the right side with a fine trocar and cannula. He was immediately relieved, but during the night almost general subcutaneous emphysema supervened, the legs only being unaffected. The next morning paracentesis was again necessary; this time the cannula was not removed, a piece of goldbeater's skin being placed on the external orifice to act as a valve. A cannula was kept in almost continuously till August 6th, when it was removed, as only clear fluid was escaping. There was slight cough and a little nummulated muco-purulent expectoration. The temperature was 101.8°.

On August 12th dyspnoea was again severe with constant cough, which resulted in his expectorating some clear straw-coloured fluid. The subcutaneous emphysema entirely prevented examination of the chest.

With the assistance of Dr. C. Nankivell, to whom I am indebted for much kind advice and help, I made a free incision into the pleura through the sixth interspace, and inserted a largish rubber drainage-tube. No fluid, but air only escaped through the wound.

On August 18th air had ceased to come through the tube, which was removed, and the wound plugged with iodoform gauze. The subcutaneous emphysema was very slowly absorbed, but about August 20th it was possible to determine that there was dulness at the right base, below the angle of the scapula, with absence of breath sounds and diminished vocal resonance.

The wound remained open until October 18th as a fistulous track which appeared to communicate directly with the lung. During cough material similar to that expectorated was discharged through the wound. On three or four occasions, once after gentle probing, there was smart hæmorrhage from the sinus accompanied by hæmoptysis. A gentle injection of carbolic lotion into the wound immediately excited cough, and the patient could taste the carbolic; the sputum also tasted of iodoform, which was used in the dressings. His recovery is now complete; he has no cough, and except for a little shortness of breath is in good health. The right lung is resonant throughout, and natural breath sounds are audible to the base.

REMARKS.—Paracentesis had been repeatedly performed in this case, and the air had been allowed to escape for more than three days continuously, until the fluid which was collecting in the pleural cavity reached the level of the cannula. When the urgent symptoms recurred incision was decided