at 3.7 P.M.; time two minutes. 3.36 P.M., can invert test tube at 3.37 P.M.; time, one minute and a quarter. Animal now unintentionally killed by running 20 c.c. of a 1 per cent. oxalate of potassium solution into the jugular vein. The blood collected after death from the portal vein clots firmly in three minutes, that obtained from the heart a few minutes afterwards clots firmly in two minutes after collection.

In the case of another experiment where a small dog (*circ.* 4 kilos.) had received 1.5 grammes of CaCl_2 by the mouth, the first sample of blood which was drawn off immediately afterwards did not set firmly for twelve minutes. The next sample, which was withdrawn half-an-hour afterwards, set firmly in one minute. The third sample, collected three quarters of an hour afterwards, clotted firmly in two minutes, and the sample collected one hour afterwards clotted in one minute and a quarter.

The above are the protocols of only three experiments out of a series of seven, in all of which the increase of coagulability was very well marked, and it seems to me beyond question that the increase of coagulability observed was due to the calcium administered. It cannot have been due that the later collected samples contained an admixture of stagnant or already coagulated blood, for the cannula was in all cases taken out of the artery, carefully washed, and reinserted before drawing off each fresh sample. Again, the increased coagulability observed was probably not due to either of two causes, which a reference to protocol of dog No. 17 will show to exert a marked influence upon the coagulability of the blood. The modifying influences referred to are (a) the effect of hæmorrhage and (b) the effect of alterations in gaseous composition upon the coagulability of the blood. The influence of hæmorrhage upon coagulability—first studied, I believe, by Vierordt—is well brought out on noting the increase of coagulability in the case of the control tubes (a) of Samples 1, 2, and 3 (*vide* protocol, *supra*). I sought to guard against any such hæmorrhagic increase of coagulability in the case of my experiments with calcium by withdrawing very small samples of blood instead of, as in protocol of dog No. 1, very large samples.

With regard to the second class of influences, the changes in gaseous composition, which are shown in the same protocol—sample 3 (a) with sample 4 (a)—to affect the coagulability of the blood, I sought in the calcium experiments to avoid this source of error by attending carefully to the respiration in each case before drawing of the sample of blood. I endeavoured by these precautions to avoid the fallacies with which the path is thickly strewn, and on consideration of these facts I do not apprehend that the explanation of the increased coagulability by the addition of calcium salts to the blood is seriously open to question, especially as we have not only the fact of the increased rapidity of coagulation to go upon, but also the fact of the great firmness of the blood clots obtained from blood after administration of lime salts. The blood clots obtained under such circumstances are so firm and tough that they will bear almost any ordinary violence without breaking; such a large disc-shaped clot as is formed by running a small quantity of blood into a quart beaker can be thrown into the air and caught again an indefinite number of times without either breaking up or even soiling the fingers. Again, in a case the protocol of which the limits on my space forbid my quoting here, I was able to diminish the increased coagulability obtained by injections of CaCl_2 by subsequent injection of a weak oxalate of potassium salt solution.

Suggestions as to the Practical Application of these Facts.—I believe that the facts communicated above are sufficient to justify me in putting forward the suggestion that it might be worth while administering calcium salts (preferably calcium chloride) in conditions where it is desired to increase the coagulability of the blood in man. Such treatment might, I think, be tried in cases of internal hæmorrhage, even in cases where the hæmorrhage is acute, for the study of the protocols given above will show that the effect of an administration of calcium chloride by the mouth makes itself felt upon the coagulability of the blood in the dog within a very few minutes of its administration. This method of treatment might therefore be practicable in the case of hæmorrhage from the intestinal canal in typhoid fever, where the calcium administered would probably act both locally as a styptic and also indirectly by increasing the coagulability of the blood in the vessels. Similarly it might be tried where *post-partum* hæmorrhage was threatened, or where it was actually occurring, or again in cases of placenta prævia. In such cases of sudden

⁷ Quoted above in connection with experiments with regard to the efficacy of the proposed styptic.

internal hæmorrhage of course very large doses would be indicated. If the dosage and the dilutions I have employed in dogs without producing either local gastric congestion or any general symptoms were transferred to man the doses would be approximately 4 drachms of calcium chloride to a pint of water; but smaller doses would probably suffice.

The same treatment would, it appears to me, be worth giving a trial to in the case of hæmophilia, where it seems at least possible that the blood may be deficient in calcium salts. Even if the deficiency in coagulating power should, however, in such cases depend upon a deficiency in the organic substratum of fibrin, or in a deficiency in the power of forming fibrin ferment, the administration of calcium salts might be expected to act at least as a palliative, since it increases the coagulability of almost every kind of extravascular plasma (for example, peptone, MgSO_4 and 10 per cent. NaCl plasma). In any case where an operation had to be contemplated in a hæmophilia patient, a course of calcium chloride might at least be tried. The same thing applies in such cases of aneurysm as cannot be treated surgically. Possibly, also, a similar treatment might be undertaken in anticipation of certain surgical operations where it was important to avoid all possible hæmorrhage, or even perhaps, though the remark seems facetious, where one had to take one's chance of a bullet without having a surgeon conveniently to hand.

It must, however, be noted that the calcium chloride is excreted very rapidly through the kidneys so that the coagulability of the blood soon reverts to its normal level.

ON THE METHODS OF STRETCHING OR EXCISING A PORTION OF THE INFERIOR DENTAL, LINGUAL, AND SUPERIOR MAXILLARY NERVES FOR EPILEPTIFORM NEURALGIA (TIC DOULOUREUX).

By W. J. WALSHAM, F.R.C.S.,
Assistant-Surgeon to, and Lecturer on Anatomy at, St. Bartholomew's Hospital.

In the article on the various surgical procedures devised for the cure or relief of trigeminal neuralgia—"tic douloureux"—lately published in the BRITISH MEDICAL JOURNAL, Mr. Horsley, in speaking of the operation for stretching or excising a portion of the inferior dental or lingual nerves by the incision through the mouth, states that this operation may "now be said to be very rarely practised." I was surprised to read this, since it is an operation I have performed very frequently during the last twelve years, and I have come to regard it as the simplest, the safest, and the best of the methods of exposing these nerves. Mr. Horsley says, "The great objection to such an operation is the certainty of the wound becoming septic, and the consequent inconvenience and danger to the patient, not only from the danger of local necrosis, but of general infection." Seeing that the wound communicates with the mouth, I imagine it cannot be denied that it may become septic, but at the same time I can affirm, from an experience of a very considerable number of these cases, that it heals up perfectly in a few days, and generally by the first intention. I have never seen any general infection follow, and in only one case was there suppuration and local necrosis. But this happened to one of the first patients on whom I operated in this manner, and I attributed it rather to my then inexperience of the operation, and consequent unnecessary disturbance of the parts in exposing the nerve, than to any defect in the operation itself. Moreover, my experience of wounds in general about the mouth is that, as a rule, they heal exceedingly well. I do not think, therefore, that any fear of septic trouble, local or general, need deter us from choosing this operation, if in other respects it appears superior to others that have been proposed or performed. That it is superior I claim for the following reasons: (1) That there is no external wound or disfigurement whatever; (2) that no muscle or other important structure is divided; (3) that no removal of bone is necessary; (4) that the parotid

gland and the articulation of the jaw are not interfered with; (5) that the exposure of the nerves is all that can be desired; (6) that the wound heals readily in a few days, and that the patient, as a rule, may be said to be practically convalescent from the time he recovers from the anæsthetic.

There are some points, however, to which it is important to attend in performing this simple little operation. 1. A clean and free incision should be made through the mucous membrane to facilitate rapid healing. 2. The internal pterygoid should be separated from the bone without unnecessary bruising; and (3) care should be taken not to detach the periosteum from the jaw. As an example of the simplicity and safety of the operation, I may mention the case of a patient on whom I have operated some five or six times through the mouth. I first stretched his inferior dental nerve ten or twelve years ago. He has perfect immunity from pain after each operation: on the last occasion but one, for about eighteen months. On each recurrence of the neuralgia he comes into the hospital, has his nerve stretched, leaves on the second or third day after the operation, and is thus only incapacitated for business for a few days.

I have read over the steps of Mr. Horsley's operation very carefully, and am acquainted with the operations to which he refers; but I confess that after reconsideration of the subject it still seems to me that the incision through the mouth is by far the best operation. I make this communication since it seems to me a pity that so simple, so safe, and so efficacious a procedure should fall into disrepute.

I have a word or two to say on the method of stretching or excising the superior maxillary nerve and removal of Meckel's ganglion. In the few instances in which I have operated, I have reached the nerve and ganglion by working through the antrum, chipping away the lower wall of the infra-orbital canal, and trephining the posterior antral wall. I have had no difficulty with regard to the healing of the antral wound. It seems to me that when the periosteum is separated from the orbital floor, and the upper wall of the infra-orbital canal is attacked, there must be some slight risk of injury to the contents of the orbit; whilst, moreover, the antrum may still be opened, but in such a position that it would there be impracticable to obtain a dependent drain.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

APOMORPHINE IN ARDENT FEVER.

D. Z., Royal Artillery, aged 31, had served in the West Indies 5½ years, and during that time he suffered from enteric fever once, from bronchitis twice, and from ague once. He embarked for England in H.M.S. *Orontes*, at the end of March, 1891, and on April 12th he was brought to the military hospital on board at 8.30 A.M. in a semi-conscious state. His face was flushed, his eyes congested, pupils semi-dilated, and skin hot and dry; the temperature was found to be 106° F. He was given 20 grains of quinine and was put into a wet pack. The temperature was taken at intervals, but there was no marked change. At 11 A.M. it was 105.8°, and at noon it was the same. I then injected apomorphine gr. ⅙ into the right arm. At 1 P.M. the temperature had fallen to 102.8°. He vomited during the interval about 2 ounces of yellowish undigested matter. The wet pack was then discontinued. At 2 P.M. the temperature was 102.2°, and at 3 P.M. 100.6°. He was given milk freely. At 2 P.M. he was given half a pint of strong beef-tea, and at 3 P.M. 1½ ounce of brandy with 2 ounces of water. During the day he had ice to suck.

The cause of the fever was somewhat obscure, as he said that he had not been exposed to the sun, but had been working as usual near to the galley on the main troop deck. It was a case of ardent fever, and the effect of the apomorphine was very marked.

He slept from 3 P.M. till 6 P.M. At 6 P.M. the temperature was 99.2°. At 8 P.M. the pulse was found to be weak. The heart sounds were carefully listened to, but there was nothing specially requiring note about them.

On April 13th, after a good night's rest, his temperature was normal and he was generally better. Simple nourishment was taken during the day. The subsequent progress of the patient—who was treated with quinine, to which was added after a short time antimonium tartarate gr. ⅓, as he had a slight cough and complained of a tightness over the chest, although on examination the sounds were normal—was satisfactory.

On April 22nd the man was in a good state of health, and he was discharged from hospital fit for duty.

W. B. MILLER,
Portsmouth. Surgeon-Major Medical Staff.

PLACENTA FOLLOWING HEAD.

On October 16th I was called to a confinement eight miles away. The woman had been in labour five hours. The os was fully dilated, the membranes were unruptured, and the head presented in the left occipito-cotyloid position. I ruptured the membranes, and in two hours the head was born. The shoulders seemed rather slow in coming forward, and I found that the cause of the delay was the placenta, which was expelled in front of them. The child was born dead, and there was no hæmorrhage at any time. The pains seemed to me quite normal, but the woman complained of its length, as her former ones had been unusually quick. In studying the mechanism of this condition, I should suppose that the placenta had grown from the lower segment of the uterus, and that the point of the shoulder had caught it in descent and expelled it in front of it.

North Collingham, Notts. FRANK BROADBENT, M.R.C.S.

NOTES ON A CASE OF CANCER OF THE PANCREAS. The following case presents some points of interest, and is worth recording from the manner of death.

E. R., aged 51, a vagrant, was admitted into the casual ward of the workhouse. She had tramped several miles during the day, and appeared to be well in health. During the evening she complained of pain in one leg, which was swollen. In the night a woman sleeping in the same room was awakened by hearing her companion breathing heavily, but as this soon ceased she went to sleep again. In the morning E. R. was found to be dead.

I made a *post-mortem* examination a few hours after death. The body was well nourished; there was some œdema of the left leg. On opening the chest the heart was found to be healthy, but the pulmonary artery was blocked by a large clot, which was evidently the cause of the sudden death. Remembering Trousseau's statement that "spontaneous coagulation of the blood is common in cancerous patients," I examined all the abdominal organs, and found the pancreas affected by cancer. The pancreas was much enlarged, weighed 7½ ounces, was hard on section, and presented all the appearances of scirrhus. The liver and spleen were enlarged and congested. Kidneys and suprarenal capsules, stomach, uterus, and all other abdominal organs healthy. On microscopical examination the tumour of the pancreas was found to be ordinary scirrhus.

The case is, I think, especially interesting as showing the connection between abdominal cancer and the tendency of the blood to spontaneous coagulation in the veins. Had no *post-mortem* examination been made, the cause of death would probably have been returned as one of "heart disease" or "syncope," for, as far as I could ascertain, there were no symptoms during life specially to direct attention to disease in the pancreas. In Trousseau's well-known article on "Phlegmasia Alba Dolens" (*Clinical Medicine*) he states that "so great is the semeiotic value of phlegmasia in the cancerous cachexia, that I regard this phlegmasia as a sign of the cancerous diathesis as certain as sanguinolent effusion into the serous cavities."

LEONARD CANE, M.D.Lond., B.S.,
Senior Consulting Surgeon to Peterborough Infirmary.

EXTRAUTERINE GESTATION.

H. M., aged 33, married nine years, had had five children and one miscarriage. The last child was born on May 2nd, 1888, and was suckled for two years. The patient menstruated for the first time after the confinement when the child was 15 months old, in July, 1889. Menstruation, which usually