found lying free among the intestines in its bag of membranes, with the placenta still partly attached to the lower half of the uterus. There was a large rent extending from the middle of the vagina on the left side up through the cervix to about the junction of the middle and lower third of the body of the uterus; the left broad ligament had been split from far out on the lateral pelvic wall to close up against the bladder. There were only a few small clots in the abdominal cavity.

After removing the child with the placenta and membranes intact subtotal hysterectomy was performed, leaving the appendages, since they were healthy. The tear in the cervix and vagina was closed with a continuous catgut suture, and the stump of the cervix was sewn over in the same way. The abdominal wall was closed in four layers without drainage. The patient stood the operation fairly well. On her return to bed the stomach was washed out, as it had been found very distended. Within an hour after the completion of the operation, however, her condition became grave. She was restless, and her pulse had risen to 160, but by 8 a.m. she was improving, and by midday was decidedly better. By 2 p.m. the pulse rate had dropped to 130. The temperature was 98.6° F. and the respirations 30.

After this the patient made steady progress. There was a slight degree of fever for the first six days, up to 100°, and once to 100.5° F.; then the temperature became normal for three days, rose slightly on the two following days, and after that returned to normal. Her pulse was 100 to 120 for the first few days.

At the end of the first week slight thickening was felt in the upper part of the broad ligaments on either side, but there was very little tenderness. The patient took her food well from the first. The wound healed by first intention, and she was discharged well on October 24th.

The patient was seen a month later, and, except for moderate anaemia, was doing well. On vaginal examination the pelvic contents appeared quite normal, and there was no sign of cellulitis. The cervix was patulous on the left side on the site of the old tear.

The specimen was sent to the gynaecological museum of the Calcutta Medical College Hospital.

THE PROMOTION OF CALCIUM RETENTION.

BY

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THE success of calcium therapy is so dependent upon the degree of retention it achieves that satisfactory results can only be expected when the principles underlying calcium retention receive at least as much attention as its administration. Even in the discussions on the therapeutic uses of calcium salts at the Annual Meeting of the British Medical Association last July, this close connexion does not appear to have been sufficiently emphasized.

Unless the principles of calcium retention are given the consideration their importance deserves, failures and incorrect conclusions as to the value of calcium therapy are the inevitable results. In some cases there would be no retention of calcium, but, on the contrary, an increased loss, since it favours acidosis. When the dose of calcium chloride is as heavy as 10 grams a day—and as much has been given by one physician—it is not surprising that the results are so entirely disappointing as to bring calcium therapy into disrepute.

Acidosis is readily recognizable by the increased acidity of the urine, and the higher the degree of acidity the more lime the urine has withdrawn from the blood, as was shown by Schetelig in 1880 and confirmed more recently; the weaker also must have been the alkaline reaction of the blood from which the urine was excreted. It is therefore a logical inference that the losses of calcium are smaller (or the calcium retention is greater) when the degree of blood alkalinity is high. This degree corresponds under normal conditions with 0.3 per cent. of sodium carbonate (or bicarbonate in the venous blood). In other words, as the blood alkalinity decreases the calcium loss in the urine rises above the normal, which is 0.2 gram in twenty-four hours.

This leads to consideration of the question as to how the blood alkalinity is created and maintained in man and herbivorous animals. Carnivorous animals obtain their sodium carbonate from the interaction of ammonium

carbonate and sodium chloride; in man and omnivorous animals this occurs completely only under such conditions as prolonged hunger. The most common factor in alkalization in man and the herbivora is the oxidation of the alkaline salts of organic acids; potassium and sodium salts, especially of citric and malic acids, are contained in leaves, roots, tubers, and fleshy fruits. The potassium citrate and malate in such vegetables are converted into sodium salts by the sodium chloride contained in the meals. These salts, however, are lacking in meat and all kinds of seeds, which indicates the importance of a well-balanced diet. It is a very important and significant fact that milk contains sodium citrate; otherwise a baby would suffer from acidosis from the first day of its life.

Proteins, however, which form such an important part of present-day diet, favour a state of acidosis. Their sulphur contents appear in the urine as sulphuric acid and ester-sulphuric acid, and their phosphorus contents as acid phosphates. Therefore the physiological laws of a correct diet are observed by the usual practice of supplementing a dish of meat with potatoes, or cabbage and fleshy fruits. When, however, the meals consist of an excess of meat, beans, and bread, without any green vegetables or fruits, there would be no calcium retention, and ailments, such as gout, might gradually arise. It would definitely be a mistake to employ calcium chloride in such a case.

With animals, such as cattle and horses, which feed chiefly on hay, the use of calcium chloride produces excellent results by favouring growth, fecundity, and health. The normal dose of calcium chloride has been inferred from physiological laws, and fixed at 0.04 gram of the crystallized salt to 1 kilo of body weight, or 0.02 gram of the anhydrous salt. Hay contains alkaline salts of citric, malic, and other organic acids, which provide for calcium retention and counteract the acidosis produced by calcium chloride.¹ Therefore, when due consideration is given to the usual diet of man, calcium lactate is preferable to calcium chloride, since it does not favour acidosis, and far superior still to calcium lactate is the double salt of calcium and sodium lactate (Wulffing), since it favours calcium retention by being oxidized into carbonate. Many physicians have used it with most excellent results.

Is the calcium content of the blood a reliable index?

There is still considerable adherence to the view that a deficiency of lime in the system can be recognized by determining the amount of calcium in the blood. It has, however, been proved by various workers that this is decidedly unreliable, and Stewart² was right in calling that index unsatisfactory. Indeed, it has been commonly observed that, in various diseases which readily respond to calcium therapy, the blood calcium was normal, or higher than normal, and not lower, as one would expect. In other cases, again, the calcium index of the blood was below the normal. In short, the evaluation of the calcium content of the blood is not a sure guide for the application of calcium therapy. Such an examination of the blood calcium is, moreover, unnecessary, even if there is a developing disease which cannot be definitely diagnosed, since calcium can do no harm in any case, and frequently acts as a prophylactic.

The fact that a lack of lime in certain organs is sometimes coincident with a rise of blood calcium is accounted for when we remember that the calcium stored in the bones can be utilized to fill up deficiencies in other and more vital parts of the body. Since this transfer of calcium takes place through the blood, an increase of blood calcium may be observed in spite of a deficiency of calcium in certain other organs. Sometimes when there is not enough calcium in the food bone calcium will supply the material needed for calcification of tuberculous foci in the lungs, or it may serve to calcify weak arteries and thus increase their power of resistance against a rise of blood pressure. Even the teeth may be called upon to give up part of their calcium in certain cases; hence the suggestion by many women that the birth of each child costs the mother a tooth.

How unreliable an index is the evaluation of the blood calcium has recently been again demonstrated in cases of urticaria undergoing hospital treatment. Because the

blood calcium was found to be normal it was doubted whether calcium therapy would be of any use, and this in spite of the work of Wright and Bettman and the observations of numerous other authorities. Herzfeld and Lubowski³ observed hypercalcaemia in 100 patients who suffered from neuralgia, chorea, tabes dorsalis, and chronic enteritis, yet calcium therapy has furnished splendid results in cases of neuralgia. Vergliano, Looft,⁴ and Tschiember⁵ have observed hypercalcaemia in a series of cases of tuberculosis; Loeper and Bechamp⁶ in cases of nephritis, asthma, and pneumonia; Longo⁷ in rickets, and Blum⁸ in a case of osteomalacia. In all these cases, however, calcium therapy would have produced entirely satisfactory results, in spite of the contrary inference from the state of hypercalcaemia.

REFERENCES.

- ¹ Cf. Oscar Loew: *Der Kalkbedarf von Mensch und Tier*, fourth edition, O. Gmelin, Munich. ² *British Medical Journal*, October 29th, 1927. Report of Discussion of the Therapeutic Uses of Calcium Salts, p. 777 et seq. ³ *Deut. med. Woch.*, 1923, p. 603. ⁴ *C. R. Soc. de Biologie*, 1924. ⁵ *Ibid.* ⁶ *Ibid.*, vol. 69. ⁷ *Il Polietnico*, 1910, p. 495. ⁸ *Presse Médicale*, 1922, p. 223.

Memoranda :

MEDICAL, SURGICAL, OBSTETRICAL.

PNEUMOCOCCAL PERITONITIS DURING THE PUERPERIUM: RECOVERY.

THE rarity of the occurrence of pneumococcal infections of the peritoneum would seem to justify publication of a case, especially since recovery ensued.

A woman, aged 24, was delivered of her first child on May 16th, 1927. The labour was conducted by Dr. C. Fraser, who simply eased the head over the perineum with forceps, under light chloroform anaesthesia. The labour was otherwise normal, and the placenta was expelled half an hour after delivery.

On May 23rd, seven days after delivery, the temperature rose to 103.2° F., and the pulse rate was 140. On the following day I was called to see her by Dr. Fraser, and gently brushed over the interior of the uterus with a gauze swab on a holder, but found no retained chorion; the uterus had scarcely involuted at all. I injected an ounce of sterile glycerin through a catheter into the uterine cavity, after the manner of Remington Hobbs. The patient was also given 5 grains of quinine bishydrochloride intramuscularly, and 60 c.cm. of polyvalent antistreptococcal serum, since the case looked like a streptococcal infection; but the report by Dr. H. M. Galt on the swab which I took from the cervix was that the film showed Gram-positive diplococci, while from culture were recovered diphtheroids, *Staphylococcus albus*, and a few coliform bacilli.

On May 25th the temperature had fallen to 99.4° F. and the pulse rate to 100, the patient being very comfortable. I contented myself by giving a further 5 grains of quinine and injecting another ounce of glycerin into the uterine cavity. On May 26th in the morning the temperature again rose to 103° F., and the patient complained of severe pains in the lower abdomen. Towards evening the abdomen had become rigid; vomiting had set in, and the pulse was uncountable.

It was obvious that the patient had general peritonitis, and the case looked hopeless. She was given an anaesthetic, and I opened the abdomen, and found the coils of intestine, as also the uterus, tubes, and ovaries, coated with a greenish covering of fibrinous exudate. I let out about two pints of turbid fluid. Three drainage tubes were inserted through the laparotomy wound, one to the right, another to the left, and a third down into the pelvis.

On May 27th her condition was better, although she vomited from time to time. Her pulse rate was 130 and her temperature 101° F. She was pouring out copious fluid through the drainage tubes. Dr. Galt's report of the turbid fluid taken from the abdomen was that the film showed large numbers of pneumococci, while on a tryptic medium an abundant and pure growth of pneumococci was obtained. On receipt of this report the patient was given 10 c.cm. of Pané's antipneumococcal serum.

On May 28th her condition had further improved; she ceased vomiting, her bowels acted, and she began to take nourishment. She was given another 10 c.cm. of Pané's antipneumococcal serum. On May 29th a further dose of the serum was injected; pus was coming freely through the drainage tubes.

From this point her recovery was uninterrupted, although her temperature did not become normal until the end of June. An abscess in the right forearm, which also proved to be pneumococcal, was opened on June 16th. She is now in good health.

I have ventured to report this case since pneumococcal peritonitis during the puerperium is rare. In making a search through the literature I have so far found only one case, although there must have been others, no doubt, where a bacteriological examination was not made. This case is reported by Professor C. Monckeberg¹ of Santiago du Chili. His case was fatal, and differs from mine in that pneumococci were found in the swab taken from the cervix;

pneumococci were also found in the mouth of the "sage-femme" who attended the woman in her labour, which may or may not have been the cause of infection. No laparotomy was performed in this case, but the necropsy revealed purulent endometritis, pneumonia, and peritonitis. The pneumococcus was found abundantly in the ascitic fluid, as in my case.

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HAEMORRHAGE FROM THE DEEP EPIGASTRIC ARTERY INTO THE RECTUS ABDOMINIS.

THE following case is of special interest in view of the diagnostic difficulty experienced.

A man, aged 55, was admitted to the Kettering General Hospital with a provisional diagnosis of acute intestinal obstruction. He had continued his work until the morning of the day of his admission to hospital, when he had a sudden attack of pain in the umbilical region; the pain was definitely localized, increasing in severity with each respiration. On palpating the abdomen the left rectus was found to be markedly rigid, and there was also a certain amount of general abdominal rigidity; a definite painful area on pressure was present about the middle of the left rectus. The bowels had acted in the morning before the onset of pain; the abdomen was not distended, and the flanks were resonant. There were repeated attacks of feeling sick, but he was unable to bring anything up. The tongue was furred and the breath foul. The temperature was 98° F., and the pulse 108 (6 p.m.). An enema was given with good results. Operation was postponed, and the patient was kept under close observation. At 2 o'clock the next morning the temperature was 100.4° F., and the pulse 76; pain and rigidity still persisted. At 10 a.m. the temperature was 99° F., and the pulse 80. As the pain and tenderness persisted it was decided to operate. The abdomen was opened in the middle line above the umbilicus, and the middle third of the left rectus was found to be the seat of haemorrhagic effusion with apparently no other pathological lesion. The patient became worse under the anaesthetic, and, although the operation was short, stimulants had to be resorted to twice before he left the table. Death occurred on the fourth day after operation.

At the necropsy the haemorrhage into the rectus was found to have increased. The heart valves were apparently normal, but the myocardium was extremely friable; throughout the arterial system there was what appeared to be an advanced stage of general arterio-sclerosis.

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TINEA INTERDIGITALIS PEDIS.

IN his recent address on ringworm and its treatment Dr. J. M. H. MacLeod mentions (*British Medical Journal*, April 21st, p. 656), among other varieties of ringworm affection, a type of "eczematoid ringworm of the extremities"—otherwise tinea interdigitalis pedis. Without discussing the question of which particular variety of epidermophyton is responsible for this most discomfiting and intractable affection, I desire to question the wisdom of part of the treatment recommended for it by the lecturer—namely, the advice to soften the skin by soaking in salt water or wading in sea water; and perhaps also the choice of medicament.

This affection manifests eczematous characters, and always appears to be readily curable in cold climatic conditions, but recurs somewhat unaccountably in the summer time, or more particularly under tropical conditions of living, when it is then most intractable. Any such conditions which result in undue moisture of the skin between the toes induce a fresh outbreak of symptoms, initiated by intense irritation and followed by vesication, painful fissures, and the appearance of white sodden patches of thickened epidermis between and beneath the toes. Moisture and warmth are the two factors necessary to promote development of this fungoid affection, which seems able to remain unnoticed in the epidermis for months before reappearing. Salt-water bathing is harmful, because it usually leads to moisture remaining between the toes despite careful drying, and sea wading especially so, because in addition it means spreading of the toes, with consequent causation of fissures made needlessly worse than they otherwise might have been. I would certainly dissuade any sufferer from sea wading or walking barefoot on a sandy beach if previous experience had not already made him wise. It has been demonstrated to me that a week's indulgence of sea bathing in the summer can precipitate the reappearance of this affection after

¹ *Gynécologie et Obstétrique*, Tome vi, 1922, No. 1.