

## Reports of Societies

### RENAL CALCULI IN PREGNANCY

At a meeting of the North of England Obstetrical and Gynaecological Society in Liverpool on March 20th, with the president, Dr. RUTH NICHOLSON, in the chair, Mr. C. H. WALSH read a note on renal calculi in pregnancy.

He said it had been noted that kidney stones were rare in pregnancy, this being accounted for by the fact that renal lithiasis occurred, as a rule, in women between the ages of 30 and 50, and most pregnancies before 35. The condition presented many interesting features regarding diagnosis, the value of biochemical tests as a guide to treatment and prognosis, and the particular line of treatment. A further point of interest was the presence of ureteric dilatation normally occurring in pregnancy. Mr. Walsh had seen three cases of renal lithiasis in pregnancy during the latter half of 1935. The first patient, aged 36, was seen at the fourteenth week of her third pregnancy. She had complained of pain in the left loin for two years. The urine contained blood and *B. coli*, but no casts were present. X rays had revealed two stones in the left kidney. Nephrolithotomy was performed, with removal of the calculi. Convalescence was uneventful. The second patient, a trigravida aged 30, was first seen at the twentieth week of pregnancy, when she was regarded as a mild case of toxic albuminuria and treated as such, but the albumin increased in amount, so she was admitted for investigation. The output of urine was up to 67 ounces per day, and a trace of blood and pus was found, with *B. coli* in moderate amount. She improved with rest and dieting, and was discharged two weeks later, the urine containing a trace of albumin only. She was readmitted at the thirty-sixth week with marked oedema and albuminuria, and, having slight hydramnios, was examined radiologically, when a large branched calculus was apparent in the right kidney. Mainly on account of the hydramnios and oedema, it was decided to induce labour at the thirty-eighth week. The labour and puerperium were normal. Three months later, after further renal investigation had revealed a functionless right kidney, nephrectomy was performed. The third patient, a primigravida aged 20, was admitted at the twentieth week, acutely ill with symptoms simulating acute appendicitis, though the urine contained some albumin and pus. An extraperitoneal abscess was found, but the appendix was normal. The extraperitoneal tissues were drained and the wound partially closed. The pus contained *B. coli* and non-haemolytic streptococci, and an x-ray examination ten days later revealed a large calculus in the right kidney. The patient was kept under observation week by week, during which time her general health remained extremely good; she went into labour at the thirty-eighth week, and was delivered by natural forces of a child weighing 5 lb. 4 oz. The puerperium was uneventful. Mr. Walsh felt that there were a number of points of interest in the cases. In only the first case was it possible to suspect a renal calculus from the history, and in view of this it seemed likely that renal stones were not infrequently missed. The second patient had been operated on for chronic appendicitis, and had been treated for toxic albuminuria before an x-ray examination on account of hydramnios revealed the true state of affairs. Regarding the investigations which were usually undertaken, he had been interested to learn if there was any biochemical test which would serve as a guide to prognosis and treatment in renal pathological conditions generally during pregnancy. After an investigation of a number of cases of toxic albuminuria with regard to blood pressure, blood urea, and urea concentration findings, and their correlation with clinical results, he was of the opinion that only in the case of blood pressure readings was a reliable guide to be obtained. The urea concentration and blood urea were much too erratic to give any guide to prognosis. These remarks applied particularly to toxic albuminuria, but were not considered out of place in discussing renal calculi. Regarding the question of ureteric dilatation during pregnancy, a feature which was evident on the

sound side in each of the three cases, demonstrated by the injection of uroselectan and x-ray therapy, this was a normal state of affairs during pregnancy, and had originally been attributed to pressure on the ureters at the pelvic brim by the pregnant uterus. There seemed little doubt in view of recent work that this theory was quite wrong, and that the true explanation lay in an altered endocrine function present in pregnancy and affecting all involuntary muscle; it acted either directly or in conjunction with the sympathetic nervous system. In the question of treatment of diseased organs complicating pregnancy Mr. Walsh had formed the opinion that there was a widespread tendency towards terminating the pregnancy as a preliminary to surgical treatment. He considered this attitude entirely wrong, and felt that, speaking generally, even severe surgical conditions could be dealt with with little risk of interrupting the pregnancy. Applying these principles to the three cases under review, he considered that the first was correctly treated by nephrolithotomy at the fourteenth week. In the second case the renal lithiasis was not diagnosed until the thirty-sixth week, and there was thus little to be gained and much to be lost by surgical intervention at that time. In the circumstances induction of labour at the thirty-eighth week appeared to be rational. Looking back at the third case he concluded that nephrectomy at the twenty-fourth week was the method of choice, despite the fact that, as things turned out, conservative treatment resulted in a live birth, leaving a diseased infected kidney to be removed later. He summarized his conclusions as follows. (1) The diagnosis of kidney stone was difficult, and liable to be mistaken for conditions peculiar to pregnancy. (2) In reading radiographs during pregnancy after the intravenous injection of uroselectan it should be remembered that there was normally a state of ureteric dilatation. (3) Urinary and blood biochemical tests were of no help in prognosis or as a guide to treatment. (4) The guiding principle to treatment should be to remove the stones or kidney, and ignore the pregnancy.

Mr. J. W. BURNS agreed that the biochemical tests were of no value. He thought that the blood pressure was more useful as a guide to treatment in cases with albuminuria. Mr. P. MALPAS did not agree with the previous speakers, and thought that the non-protein nitrogen index had a certain value in eclampsia, especially if taken together with other findings and the clinical condition of the patient. If there was gross liver damage this index might not be grossly increased, although the patient was gravely ill. He referred to six patients whom he had recently encountered suffering from renal calculi. Mr. A. A. GEMMELL supported Mr. Malpas, and attached some value to renal efficiency tests during pregnancy. These were useful if fitted in with the clinical condition. He had found that the blood urea and the urea concentration tests improved in cases where the foetus had died *in utero*. Mr. HAMILTON referred to a patient with renal calculi who gave an eight-year history of haematuria. There was a large branched calculus in the left kidney. Pregnancy was allowed to continue until the thirty-eighth week, when induction was carried out for disproportion. The haematuria disappeared after delivery. Mr. C. M. MARSHALL thought that the liver damage vitiated the blood non-protein nitrogen results, and referred to a case in which he had decapsulated the kidneys because of the clinical condition of the patient, although the non-protein nitrogen was under 40 mg. per cent.

#### Simmond's Disease

Mr. J. ST. GEORGE WILSON, reporting two cases of Simmond's disease, said that this syndrome, which was most common in women, was first described in 1914, and was typified by progressive loss of weight and senile changes—such as loss of hair and an aged appearance, inhibition of genital function, and amenorrhoea. Lassitude and weakness were marked. The basal metabolism was markedly lowered, and the pulse was slow. There was anaemia, and there might be hypoglycosuria. Radiologically there might be enlargement of the sella turcica if the lesion was a neoplastic destruction of the pituitary. The first patient, aged 29, had complained of loss of

weight, following a normal confinement. There had been daily vomiting, dizziness, and loss of power in the left hand. She had, however, no loss of hair, and did not look prematurely aged. She had complained of amenorrhoea for the last twelve months, having previously been irregular. She was poorly nourished, having suffered from marked loss of weight. The blood pressure was 114/72, and the pulse 44. The cervix was multiparous and the body of the uterus small. She was treated by injections of insulin and pregnyl, and extra salt in the diet. The second patient, aged 37, also dated her symptoms to a confinement. She complained of loss of weight for twenty-one months, nausea for twenty months, and weakness for six months. She was stated to be looking much older than previously, and had had amenorrhoea for twenty-eight months. Her weight was 4 st. 10 lb. She exhibited hair on the face, pigmentation of the abdomen, a blood pressure of 98, and a pulse of 42. She had complained of amenorrhoea constantly for the preceding twelve months, having previously had scanty periods at intervals of five to six months. The uterus was found to be senile. She was treated by injections of antuitrin S and oestroform, and was given olive oil; eight months later she had gained 3 st. in weight.

Mr. S. B. HERD commented on the fact that in each case the condition had closely followed pregnancy. He wondered if in the past these cases had merely been considered as instances of superinvolution. Mr. T. N. A. JEFFCOATE considered superinvolution of the uterus to be due in all cases to pituitary disease. He also questioned whether there might not be also in Simmond's disease an element of suprarenal dysfunction. Dr. E. A. GERRARD referred to the relationship between prolonged suckling and superinvolution. He did not agree with the last speaker that there was of necessity a diseased pituitary body. Mr. F. E. STABLER asked if an Aschheim-Zondek test had been performed, as he had seen a case of the condition where it was slightly positive. Mr. ST. GEORGE WILSON replied that he thought there was a definite distinction between Simmond's disease and a simple uterine subinvolution. In the latter condition there was no loss of weight or other disturbance, and he failed to see that it was necessarily due to pituitary disease. An Aschheim-Zondek test had not yet been performed, but would be arranged.

#### Uterine Rupture and Placenta Praevia

Mr. C. McINTOSH MARSHALL described two cases of uterine rupture associated with placenta praevia. In the first case the rupture was spontaneous and in the second case it was traumatic, owing to a stomach tube, which had been inserted into the uterus as a means of induction of labour, having been passed through the uterine wall into the bladder.

The first patient was a 4-para, aged 29. She was admitted to hospital believing herself in labour, but the pains passed off. Vaginal examination a week later revealed a lateral placenta praevia, the os admitting one finger. After a further week pains began spontaneously, and after nine hours in labour some blood and clots were suddenly passed from the vagina. Vaginal examination showed that the cervix, though not too well taken up, admitted two fingers, and that the membranes were ruptured. The os was partially covered by the placenta, which was on the posterior wall of the lower segment. The child's head was macerated, and there was marked overlapping of the parietal bones. Willett's forceps was applied to the scalp, and a weight of 1 lb. attached. No further bleeding occurred. Four hours later the child, which weighed 5 lb. 11 oz., was delivered; it was macerated, and had an offensive odour. No bleeding followed the birth of the child, but an hour later the patient was pale and her pulse was rapid and soft. The placenta had not been delivered. During the next few hours her condition improved, and four hours after delivery it was decided to remove the placenta. As soon as anaesthesia had been induced a blood transfusion was commenced, and on passing the hand into the uterus a laceration was discovered in the lower segment. Laparotomy followed, and a large amount of free blood was found in the peritoneal cavity, also the placenta. There was a vertical tear three to four inches in length in the posterior wall of the lower segment and cervix. Subtotal hysterectomy was performed, and a drainage tube was inserted. Convalescence was stormy, but eventually the patient made an excellent recovery.

Mr. Marshall referred to a case reported by De Sa where spontaneous rupture of the uterus had also occurred through the placental site.

The second patient was a primipara, aged 22, who was six days over her expected date, the head being still above the brim. A stomach tube induction was carried out by an experienced house-surgeon. A general anaesthetic was not employed, but the tube was passed under direct vision, a speculum being used and the anterior lip of the cervix grasped with a sponge forceps. When about two inches of the tube had been inserted some resistance was met with, but was easily overcome, and the rest of the tube was inserted without difficulty. Pains commenced five hours later, and after a further ten hours the cervix was almost fully dilated, the head, however, being still above the brim. The stomach tube had not been extruded. The urine was found to be heavily stained with blood. On cystoscopy the stomach tube, which had been palpated through the anterior vaginal wall, was clearly seen in the bladder. Delivery of a living child was effected by version and extraction, and the placenta, which was inserted low on the anterior uterine wall, was removed manually. It was noted that its lower edge was about one inch from the cervical lip. A median suprapubic incision was made, and the utero-vesical pouch of peritoneum was inspected; no injury was seen. The peritoneum was then closed; suprapubic cystotomy was carried out and the tube removed. The bladder was drained. Cystoscopic examination a month later revealed a small, slightly raised puckered area lying behind the base of the bladder. This had a similar appearance to the cystotomy scar in the fundus.

Mr. ST. GEORGE WILSON expressed doubt whether in the second case the stomach tube had passed through the placental site. He was inclined to think that it had been forced through the wall of the cervix. Mr. A. J. STABLER thought that the first case could hardly be considered as one of spontaneous rupture, since Willett's forceps had been applied. Regarding the second case, he felt that a tube should never be passed without general anaesthesia. Apart from the difficulty which might be experienced, it was impossible otherwise to ensure an adequate aseptic technique. Dr. E. A. GERRARD supported the latter observation, drawing attention to the morbidity which frequently followed bougie induction. Mr. C. H. WALSH questioned whether true spontaneous rupture of the uterus ever occurred. It was interesting to note that all cases reported had been in multiparae; the suggestion was that trauma at a previous confinement was really the aetiological factor.

In reply Mr. MARSHALL said that he felt quite sure that the tube had not perforated the cervix, but that it had been deflected by the edge of the placenta and had passed through the placental site. Blood transfusion was a most valuable and life-saving measure in cases of placenta praevia.

#### RESULTS OF RADIUM IN CERVICAL CANCER

At a meeting of the North of England Obstetrical and Gynaecological Society in Sheffield on February 28th, with the president, Dr. RUTH NICHOLSON, in the chair, Professor FLETCHER SHAW and Professor D. DOUGAL presented a paper on the results of radium treatment of carcinoma of the cervix uteri, of which the full text is published at page 786 this week.

In the subsequent discussion the PRESIDENT congratulated Professors Shaw and Dougal on their paper and on the excellence of their results. She read on behalf of Mr. Malpas the figures from the Liverpool Radium Centre of cases treated during the years 1929 and 1930, the total five-year survival rate of all cases treated being 33 per cent. The method used was that of Heyman, followed by deep x rays. The president recalled a personal case where death had occurred from pulmonary embolism.

Mr. BURNS asked if any of the patients had suffered from annular constriction of the rectum following treatment; he had observed the condition in two cases. He also expressed the view that radium therapy was well worth while even in very advanced cases, as it relieved pain and made the end easier. Mr. T. F. TODD commented on the excellence of the results obtained, which he considered to be far and away ahead of anything else so far achieved. Except for one single year's results



from the Marie Curie Hospital he knew of nothing even comparable in the international literature. He considered that radiation was definitely preferable to surgery even in early cases. At least eight of the international centres had published a five-year survival rate of over 50 per cent. in operable cases: 10 or more per cent. better than those of surgery. Mr. Todd recalled Beckwith Whitehouse's published figures of 500 cases treated by several teaching hospitals in this country. The five-year survival rate was about 11 per cent.—a marked contrast to the present series.

Dr. ELLIS gave figures from the Jessop Hospital for Women, Sheffield, showing a 30 per cent. five-year survival rate. It was customary in Sheffield to perform Wertheim's operation on first-stage cases (if fit for operation) after preliminary irradiation. If the tumour was bulky and infected the patient had: (1) x-ray treatment for two weeks to the whole pelvis; (2) two weeks' rest, with douches; (3) radium; (4) one day later, Wertheim's operation; (5) if glands were found to be involved, further x-ray treatment to the whole pelvis was given. If the tumour was small and non-infected the procedure was: (1) a single dose of radium; (2) one day later, Wertheim's operation; (3) if glands were found to be involved, a full course of x rays to the whole pelvis was given. Cases in stages two, three, and four were given x rays, radium treatment, and then further x-ray therapy. Dr. Ellis showed a series of slides indicating the technique of the methods employed, also a slide to show the type of x-ray burn of the skin which, while healing perfectly, might be thought by the uninitiated to indicate an overdose—being in reality the dose aimed at. He also quoted Döderlein's figures in operable cases, which showed 80 per cent. five-year cures after complete irradiation as compared with 46 per cent. after operation. They afforded adequate reason for Döderlein's having given up the operative procedure. Dr. GERRARD drew attention to the excellence of the results in a series of cases which had been handled entirely by gynaecologists, without resort to their radiological colleagues. He thought that this was a point of importance, particularly since there was a growing tendency in certain areas for the general practitioner to refer malignant cases direct to the radiologist. This was hardly in the best interests of the patient, for a radiologist could hardly be expected to have had a wide experience in a special branch like gynaecology. The diagnosis in carcinoma of the cervix, particularly of the endocervical type, was not always easy, and the correct application of the radium was liable to present real difficulty unless the operator was regularly engaged in vaginal surgery. Mr. STACEY advocated Wertheim's operation in first-stage and early second-stage cases with radiation, since this precluded the ill-health from cystitis and proctitis which was liable to follow if radiation alone were employed. He considered that co-operation between gynaecologist and radiologist was advisable—the gynaecologist to diagnose the case, and the radiologist to decide the dose and apply the treatment. Professor MILES PHILLIPS also advocated the co-operation of gynaecologist and whole-time radiologist. He stressed the necessity of doing all one could to prevent carcinoma by the ruthless removal of the cervix whenever it was found in a badly damaged or chronically infected condition. The fact that the annual mortality rates showed, for a number of years, a steadily falling death rate from cancer of the uterus, whereas that from cancer in all other organs was increasing, was at least highly suggestive that this method of preventive treatment was becoming effective. Dr. CATHIE discussed the pathological aspect, referring to the grading of tumours as an aid to prognosis. He also referred to the question of radiosensitivity, and was inclined to disagree with the prevalent idea that the columnar-celled type of growth was radio-resistant.

Professor DOUGAL replied that the authors considered their series to be but small, and that they had perhaps been fortunate in their results. He agreed with Mr. Todd that there was now no justification whatever for the Wertheim operation. Regarding the question of rectal symptoms following the application of radium, he added that he had seen one case where a fistula had occurred, but the dose given had been unduly high—11,000 mg.-

hours. He considered that co-operation between surgeon and radiologist was undoubtedly desirable, though so far as the treatment of carcinoma of the cervix was concerned the dose was largely standardized. He did not think that a radiologist was the best person to apply the radium in this region. Even an experienced operator sometimes found great difficulty in advanced cases with the insertion of the intrauterine portion of the dose. Professor DOUGAL agreed also with Dr. Cathie that the columnar-celled type of growth was proving to be less resistant to radium than had been thought in the past.

### BONY SEQUELS OF PARATHYROID TUMOUR

At the March meeting of the Section of Surgery of the Royal Academy of Medicine in Ireland, with Mr. J. L. KEEGAN in the chair, a case of generalized osteitis fibrosa was reported by Professors W. BOXWELL and W. J. E. JESSOP, Mr. HENRY STOKES, and Dr. T. G. HARDMAN. Professor Boxwell and Mr. Stokes gave an account of the clinical history and operative findings.

The patient was a woman aged 64, who in 1926 had sustained a fracture of the shaft of the right humerus, due to slight injury. During the following six years she had complained of pains in the back and shoulders, right hip, leg, and ankle; she had developed scoliosis and muscular atony, and had lost weight. In June, 1932, a fracture of the left fibula occurred for an entirely inadequate reason, and in the next October a painful swelling appeared on the inner border of the right tibia. In the next month a parathyroid tumour was removed from behind the manubrium sterni, and this was followed by rapid improvement in the patient's clinical condition. Bone pains and muscular weakness disappeared inside two months, with a gain in weight of 28 lb.

Dr. T. G. HARDMAN showed radiographs of the right tibia and left fibula, demonstrating multiple large cysts; of the thorax, showing extreme scoliosis and cystic changes in the scapula and glenoid fossa; of the skull, showing the cranial bones rather thickened, with localized translucent areas due to small cysts; and of the pelvis, showing large cystic cavities in the neck of the femur and iliac bones. Radiographs taken subsequent to the operation revealed that the cysts had become much smaller; the bone was regenerating, and the cystic degenerations were becoming filled in.

Professor JESSOP described the biochemical findings, and the tumour and bone histology.

A detailed investigation of calcium metabolism showed a constantly high serum calcium figure and a persistently low plasma inorganic phosphate figure. Plasma phosphatase was eight times the normal, and the total calcium output on a low calcium diet was three times the normal. After the operation the serum calcium fell rapidly, and mild tetany developed during the first week; this was controlled by a diet rich in calcium, calcium lactate, vitamin D, and injections of parathormone. In a fortnight the serum calcium figure returned to the normal, and the calcium excretion was normal one month after the operation. Three years later the serum calcium, plasma inorganic phosphate, and plasma phosphatase figures were normal. The tumour removed weighed 11 grams, and was surrounded by a capsule. Histologically it consisted of densely packed principal cells, many of which were very large and very vacuolated. Eosinophil cells were only present in very small numbers. Small masses of homogeneous eosinophil material were found sometimes around the walls of vessels and between rows of the principal cells. A piece of bone removed from the right tibia was obviously easier to cut than normal, and histologically showed osteoporosis, absorption and deposition of bone, and fibrosis. There was no evidence of delayed calcification, and the sections did not include a cyst or osteoclastoma.

Professor Jessop stated that the principal features of a case of parathyroid tumour could be seen to follow in logical sequence the mobilization of calcium from bony tissue which was produced by excess of parathyroid hormone. Removal of the tumour led to a correction of all the abnormalities, and often enabled the patient, previously an invalid, to lead an active life. An examination of twenty-five published cases showed that no one feature was invariably present. The order of importance of findings from the point of view of diagnosis would seem to be: (1) general decalcification of the skeleton; (2) continually raised serum calcium and lowered plasma

phosphate; (3) increased calcium output; (4) bone pain and tenderness; (5) cystic changes in bone; (6) spontaneous fractures; and (7) muscular weakness and atony. Localized osteitis fibrosa, Paget's disease, multiple myelomata, and osteomalacia might resemble hyperparathyroidism, but chemical and histological examination would help to differentiate them. If there was general decalcification, with continually high serum calcium and low plasma phosphate figures, exploration of the neck was probably justified. In only about 30 per cent. of cases was there an initial complaint of bone tumour, fracture, or deformity. Bone pain was first to appear in over 50 per cent. of cases. Urinary calculi were a presenting symptom in two cases which showed skeletal change clinically or radiologically.

Mr. DENIS KENNEDY described a similar case, in which a fracture of the neck of the femur had occurred as a result of a trivial injury. A month later a painful swelling appeared in the left tibia, and after full investigation the patient was found to have all the features of a parathyroid tumour. The case was complicated by the fact that auricular fibrillation was present. The right lobe of the thyroid gland was isolated, and a parathyroid tumour was found in the centre of its posterior aspect. There was no post-operative tetany, and the patient was now well. Dr. C. L. McDONAGH said that only twice had he seen such large cysts. He pointed out that the original fracture of the humerus showed no evidence of a cyst. In such cases the changes in the skull were the most definite means of diagnosis.

## CORRESPONDENCE

### A Crusade Against Acute Rheumatism

SIR,—The paper by Professor W. T. Ritchie under the above title, in your issue of April 4th, is a most valuable and timely one. Much has been written and said on this deplorable menace to the child and the adolescent, but I have never seen a more convincing case made out for its inclusion as a major public health subject.

London, with its rheumatic clinics and admirable in-patient accommodation, has given a fine lead, but without the encouragement and stimulation of the Ministry and Department of Health it cannot be expected that most public health committees and their councils throughout the country will realize the need for action. This is particularly true of the suggestion that a rheumatism medical officer, comparable in function and status to the venereal diseases and tuberculosis medical officer, should be appointed. There would be little hope of this in the case of most local authorities unless the medical officer of health had the strong backing of a Ministry or Department circular in putting forward the proposal. The Government medical departments are reluctant to appear to coerce local authorities, but I know that medical officers of health would often welcome more specific recommendations, as these greatly impress the members of public health and education committees.

If compulsory notification is thought too drastic a measure—though I do not see why it should be so regarded—Professor Ritchie's suggestion of beginning with a voluntary scheme should be adopted without delay. No doubt the Society of Medical Officers of Health and other professional bodies will consider the matter. It would be a great public and human service if they acted promptly.—I am, etc.,

Beckenham, April 6th.

T. DRUMMOND SHIELS.

### Modern Methods in Bottle-feeding

SIR,—After reading Dr. Jewesbury's letter on this subject in the *Journal* of March 28th, I read the annotation of February 22nd to which he refers. It had escaped my notice earlier, but I should like to say now that I very cordially agree with the sentiments expressed in it. It seems to me that Dr. Jewesbury has scarcely dealt faithfully with the criticisms of the Truby King feeding formulae which it contains. Nor is one entirely convinced from what he says, that he is, as he very rightly says we all ought to be, "keeping an open mind."

Since the first attempts of Michael Underwood to put the study of this problem on a rational basis, the obvious goal has been to produce as a substitute for human milk a true imitation of it. It was believed at the time when Truby King popularized the milk modification which has become associated with his name that the goal was practically if not completely reached. Indeed, the word

"humanized" was used and still is, as certain advertisements frequently remind us. Yet it has been known for many years that this approximation is much more apparent than real, since the two milks differ markedly in the nature of their proteins. Further, it is now well recognized, as was stated in the annotation, that the protein of cow's milk is relatively deficient in certain amino-acids which are of special importance to growth, so much so indeed that, if one is to come near the goal of true imitation in this respect, it is necessary to use the milk quite undiluted. The plain truth is that at present there is no method, at once simple and inexpensive (that is, apart from elaborate methods involving the use of proprietary preparations), whereby anything like a true imitation of human milk can be achieved. Fortunately, experience seems to show that this doesn't matter. What does matter, however, is that our methods should be constantly under review in the light of new knowledge. In the present state of our knowledge we are faced with the alternative of perpetrating faults of omission or of commission. On the whole I think it is true to say that, so far as nutrition is concerned at any rate, Nature is more tolerant of the latter than of the former. She can deal with moderate excess, but a very little shortage will thwart her.

Lastly, it should be realized that the relative indigestibility of whole cow's milk is not, except in very rare instances, due to its protein content *per se* but to the buffering effect of it on the acid of the gastric secretion. This has been conclusively shown by the marked success which has attended the use of whole milk "de-buffered" by the addition of lactic acid, as advocated by McKim Marriott. In my experience infants on this feed more closely resemble in steady and sufficient gain in weight and in general vigour and resistance to infection their breast-fed brothers and sisters than do those on diluted milk mixtures. I have had the opportunity of observing quite a number of such infants in later childhood, but have not so far detected any damage attributable to the "protein insult" in infancy!—I am, etc.,

E. R. C. WALKER, M.B., F.R.C.P.Ed.

Aberdeen, April 8th.

SIR,—In your issue of March 28th Dr. Jewesbury replies to the annotation that appeared in the *Journal* on February 22nd (p. 370) under the heading "Modern Methods in Bottle-feeding." His letter, while it occupies a whole column, rather surprisingly does not refer once to the point at issue. The gist of the annotation was that owing to the relative deficiency of certain amino-acids in cow's milk as compared with human milk it was not sound practice to base the protein content of a milk mixture for infant feeding on the same basis as human milk. In other words, equal quantities of protein, one from human milk and the other from cow's milk, are not of equal nutritive value to the child.