

normal thyroid function all of whom had "myxoedema reflexes". The patient described by your correspondents had widespread atherosclerosis, an abdominal aortic aneurysm, an acute myocardial infarction, and severe ischaemia of the legs.

Is it possible that the abnormal ankle-jerk on one side may have been related not to ischaemia of the calf muscles but to ischaemia of the spinal cord due to atherosclerosis of the spinal arteries and obstruction of the segmental arteries arising from the abdominal aortic aneurysm? It would be of interest, also, to know whether serological tests for syphilis were obtained.

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### MEGALOBlastic ANAEMIA

SIR,—Although I agree with Dr. Varadi (June 13) that blood-films from antenatal patients should be examined, in my experience this is of little value in the detection of folic-acid deficiency of pregnancy. Of a series of 75 antenatal cases<sup>1</sup> only 4 showed macrocytosis on film inspection, yet 63 of these patients had megaloblastic changes in the marrow. In 17 the serum-folate by *L. casei* assay was less than 3  $\mu\text{g}$ . per ml., and in 35 less than 4  $\mu\text{g}$ . per ml. Polymorph nucleus hypersegmentation was not a striking feature on inspection of these films; and detailed lobe counting, even if useful, would not be practicable with a large antenatal clinic.

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### BICARBONATE THERAPY IN DIABETIC ACIDOSIS

SIR,—The report by Dr. Addis and his coworkers (Aug. 1) prompts us to report a comparable case.

A 37-year-old woman, previously undiagnosed as diabetic, was admitted in diabetic precoma. She was semiconscious, with severe dehydration and air-hunger. The blood-sugar was 434 mg. per 100 ml.; the capillary-blood pH (Astrup method) was 6.69 and when repeated 6.7. At these low levels it was impossible to estimate the base-deficit or  $\text{Pco}_2$ . The serum-electrolytes (mEq. per litre) were: bicarbonate, 2; sodium, 133; potassium, 4.8; and chloride, 106. Blood-urea was 54 mg. per 100 ml.

The patient was given 150 mEq. of bicarbonate after which the base-excess was  $-22$  mEq. per litre, and from the equation  $\text{base-excess} \times 0.3 \times \text{bodyweight in kg.}$  she needed 460 mEq. of base to counteract her acidosis. This was given with 4.5 litres of fluid in six hours, after which her pH was 7.28,  $\text{Pco}_2$  16 mm. Hg, standard bicarbonate 11 mEq. per litre, and base-excess  $-18$  mEq. per litre. The patient was by then fully conscious, but still drowsy and hyperventilating. Further bicarbonate was given to a total of 850 mEq., and twenty-four hours after admission her pH was 7.49,  $\text{Pco}_2$  41 mm. Hg, standard bicarbonate 30 mEq. per litre and base-excess  $+7$  mEq. per litre. At this time her blood-sugar was 179 mg. per 100 ml. In twenty-four hours she received 200 units of insulin, the initial dose being 50 units intravenously and 50 units intramuscularly. She also received 1 litre of physiological saline solution, 3 litres of dextrose-saline, and 60 mEq. of potassium chloride.

Several interesting points arose from this: first, that a pH as low as 6.69 is compatible not only with life, but also with consciousness; secondly, that in severely acidotic patients the factor of 0.3 in the Mellema and Astrup equation may have to be raised, our final calculated requirements being  $0.6 \times \text{base-excess} \times \text{weight in kg.}$ ; and thirdly, that a comparatively low blood-glucose of 434 mg. per 100 ml. can be present in the severest cases of acidosis.

The patient has since remained well on 40 units of insulin zinc suspension daily.

The ready availability of the Astrup capillary electrode

made the management of this patient much easier, particularly since the measurements could be made and interpreted rapidly.

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### STERILE WATER FOR OPERATING-THEATRES

SIR,—The article by Dr. Kelsey and Miss Beeby (July 11) prompts me to comment on the significance of "positive", albeit low, plate-counts, such as we found in testing various materials for sterility.

In tests on bottled and canned milk<sup>1</sup> we concluded that an average plate-count of fewer than 5 colonies, or a single count below 7, could always be due to contamination during sampling or manipulation. In later tests of canned meats<sup>2</sup> for sterility we came to regard a single plate-count of fewer than 10 colonies as of no significance.

We have since conducted about 17,000 routine tests for sterility at the request of other institutes and manufacturers. Conventional aerobic as well as anaerobic counts<sup>3</sup> at 32°C, using mostly soya-peptone yeast extract cysteine agar, did not differ essentially from the earlier figures.

While we therefore can corroborate the opinion of Dr. Kelsey and Miss Beeby that a quantitative method is essential in tests for sterility, and that low counts obtained from non-inhibitory substrata are generally due to insignificant technical contamination, we suggest at most 10 colonies as the limit for the number of permissible colonies per plate.

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### EXPERIENCE WITH THE MINICOIL ARTIFICIAL KIDNEY

SIR,—The introduction to this country of a disposable haemodialysis unit<sup>4</sup> was an important step forward in the treatment of acute renal failure, especially in patients who could not be safely transferred to a renal unit. The article by Mr. Kille and his coworkers (Sept. 5) prompts us to describe the application of the minicoil unit to the treatment of combined acute respiratory and renal failure.

In the past ten years the combination of respiratory and renal failure has come to be recognised as almost invariably fatal, unless the condition is controlled by means of ventilation and dialysis.<sup>5,6</sup> Our 5 patients were seriously ill and showed progressive clinical and biochemical deterioration: they had generalised and pulmonary oedema, bilateral conjunctival oedema, severe oliguria, and peripheral cyanosis. Arterial blood analysis revealed a rising concentration of urea, a low pH, and metabolic acidosis. In some patients controlled ventilation, either with air or oxygen-enriched air from a respirator, failed to correct the changes in the body-fluids. The maintenance of adequate ventilation becomes increasingly difficult, and the  $\text{Pco}_2$  rises above normal.

We believe that metabolic acidosis is an important cause of death in this syndrome and difficult to correct by means of dialysis with conventional fluid or by the use of intravenous sodium bicarbonate. Our experience suggests that, if excess body-water is removed by ultrafiltration (or presumably by osmosis) and the metabolic acidosis is corrected, then a diuresis may follow and adequate pulmonary ventilation can be established. We have achieved the first change by using the minicoil unit and vein-to-vein dialysis with a roller pump, which gave a line pressure of approximately 200 mm. Hg. The

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