DISCUSSION

MAHER (Washington): On the second paper the authors should certainly be complimented for such a survey of endocrinology in only ten minutes. Some years ago we looked at cortisol before and after dialysis and found that the values went up. We correlated this with the loss of body weight and ultrafiltration during dialysis, so I am curious as to what was the fluid balance of your patients at the time that you were measuring the cortisols.

LINDSAY (Glasgow): We certainly did not notice this at all. In fact, of the nine patients—we did this on a few occasions—there was no constant change; some went up, some went down, and they went up at different times and it did not seem to have any effect when the patients were dialysed—whether they were on evening dialysis or daytime dialysis.

SHALDON (London): Dr. Lindsay, nowhere in your paper did you define the system of dialysis you were using, or the duration of treatment, and I think this is fundamentally important as your results would indicate, by some people's standards, that your patients were inadequately dialysed. Perhaps the most sensitive index of that is in your presence of gonadal function in your women particularly. I think this is clearly documented in the literature over the years, that ovulatory menstrual cycles return only with adequate dialysis, and the absence of this in your patients would suggest that we ought to know what system you are using and the frequency with which you are using it.

LINDSAY (Glasgow): The patients are all dialysed using a coil system incorporating the 0.9 sq.cm chronacoil; they are dialysed for a minimum of two 10-hour sessions per week. We have given some indication of the criteria and we feel that our patients are being adequately dialysed. On the point of the female, I cannot disagree with you; however, it seems to me that sexual function appears to have returned very well in the male patients, and it would seem rather strange if the males have been adequately dialysed and the females are not.

BERLYNE (Manchester): How can you draw any conclusions from urinary gonadotrophins in somebody who is virtually anuric?

LINDSAY (Glasgow): I have been expecting this question! Of course we cannot. The urine volumes, as you know, have a range from 100 ml to 1 litre, and I just put it up because we measured it. But I think we have some indication that pituitary gonadotrophins are depressed from indirect measurements, in other words, the failure of spermatogenesis and failure of return of ovulation, at least in these patients.

THIU (Basle): I would like to mention a patient, for three years on dialysis now, who not only has menstruation each month, but also became pregnant and had an abortion in the sixth month; all went well up to that moment. Probably if we had done what Scribner did, dialysing five times a week, that would have been the first normal birth in chronic dialysis patients.

McGEOWN (Belfast): We have a patient who was almost totally bald when he started dialysis and I would like to show you what has happened to his head since dialysis. He has been dialysed about 18 months. This is pre-dialysis, taken from an old photograph. This is post-dialysis. (Slides showed impressive regrowth of hair—Ed.)

CHAIRMAN (Migone, Parma): Anybody requiring treatment, apply to Dr. McGeown!
DISCUSSION

DUNCAN-WARNUM (Copenhagen): What happened to the serum calcium levels of your patients, Dr. Lindsay?

LINDSAY (Glasgow): I have not shown all of our calcium data. Our general impression is that the serum calcium has, over the two years of the longest patient, tended slowly to come down a little. The three patients, who had the odd cystic change had normal serum calcium and no elevation of alkaline phosphatase. As I said, we have one patient who certainly has radiographic evidence of osteitis fibrosa cystica, and this patient has shown a characteristic biochemical picture as well.

UNIDENTIFIED MEMBER: We have been studying serum $^{47}$Ca levels after oral administration of $^{47}$Ca and total body retention of $^{47}$Ca, and we can generally confirm your results. However, there was an exceptional patient who had increased intestinal reabsorption of $^{47}$Ca concomitantly with high serum parathyroid hormone levels. Dialysis, as in your experience, did not increase $^{47}$Ca absorption in the intestine, and we could confirm this in animal experiments. We dialysed rats and assayed the $^{47}$Ca uptake and there was no change after dialysis. Inhibition of $^{47}$Ca uptake in the intestine could not be provoked by urea elevation or by producing acidosis, so that it must be a somewhat more distant result of renal failure.

DUNCAN-WARNUM (Copenhagen): I am sorry to ask Dr. Lindsay again, but what was the calcium level of the patient with the low absorption?

LINDSAY (Glasgow): The serum calciums in the patients with impaired absorption: five patients were studied and, if memory serves me correctly, four of these five have normal serum calciums; one tends to be rather low. I cannot remember exactly but the figure is in the region of 4.4 mEq/l of calcium associated with a normal serum protein.

LEONARDS (Cleveland): I would like to suggest that probably one of the most sensitive tests of inadequate dialysis is the calcium absorption. We have in all of our 20 patients studied, found a marked decrease in calcium absorption, as has been reported here today. In one patient who, for another reason, was dialysed five times a week, eight hours each, with a full-size twin coil the calcium absorption completely returned to normal.

VERBERCKMOES (Louvain): We have done some calcium absorption tests with $^{47}$Ca in dialysed patients and in uraemic controls who were not dialysed, and in normals. The preliminary results are that our patients under dialysis are between the normal and the uraemic controls. One patient with a high serum calcium level, who had been treated four months before with high doses of vitamin D, had a supranormal calcium absorption from the intestine.

UNIDENTIFIED MEMBER: I am sorry to return. When did you perform the absorption tests between the dialyses? Just after you had dialysed the patient, or later in the period?

LINDSAY (Glasgow): In each experiment we carried out, at least two days had elapsed since the last dialysis. It was a constant time.