year since, in the "mind" of the computer the last numbers of 1981, eg 801081 were obviously larger than, say 001082. This would have completely disrupted the computer searches in future years. As a result the programs had to be re-written in the format 82XXXX in time to enter the 1982 cases in the correct manner.

The above problems are indicated, not to inhibit potential computer users, but to point out that a good system will only be attained by slow, cautious development. Our system required about six months of fairly intensive work to give a service which enabled the laboratory to process all its histological and post-mortem reports. A further six months of off-and-on work has subsequently been put in to provide the icing on the cake.

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Glomerular zippers and ports?

I read with great interest Professor Moffat's excellent update on the anatomy of the kidney.¹ I must take exception, however, to the statement that glomerular capillary endothelial fenestrations (GCEF) "are not closed by a membrane".

Over a decade ago I had occasion to study renal tissue obtained by percutaneous biopsy from a 49-year-old man suffering from gross haematuria and proteinuria. Although there was no material available for immunofluorescence studies, the history as well as light and electron microscopic findings were compatible with IgA nephropathy (Berger's disease).

One of the sections prepared for electron microscopy had caught a glomerular endothelial cell approximately parallel to the plane of the capillary wall thus displaying numerous GCEF cut at various levels in the same orientation (Fig. 1). This section shows, in my opinion, very substantial evidence that at least some GCEF (at least

Fig. 1 *Glomerular endothelial cell cut on a plane parallel to the surface. Numerous endothelial fenestrations can be seen. Uranyl and lead $\times 5000$*

Fig. 2 *Detail from Fig. 1. Structures resembling central knobs of GCEF are quite evident. Some GCEF (arrow) appear to be covered by a very thin membrane. Uranyl and lead $\times 30\,000$*

some of the time) are covered by a very thin diaphragm complete with central knob (Fig. 2) as has been described.² The central knobs are more evident than the diaphragms but if there is no diaphragm then what is supporting the central knobs?

I note that Professor Moffat, as have others,³ refers to the appearance of the glomerular epithelial slit diaphragm as resembling a zipper (although certainly not suggesting that it functions as one). Reflecting upon this while viewing the GCEF diaphragm it occurred to me that this diaphragm

might be similar in both appearance and function to the device used to close the circular entry ports used on isolation cabinets. When twisted open, no covering is to be seen. However, when this structure is twisted closed, there is a thin covering complete with a central accentuation quite similar in appearance to the central knob.

Could it be that some, if not all, GCEF have such a structure which is open most of the time, or if not, opens rapidly following slight injury unless fixation is rapid and optimum?

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Professor Moffat replies as follows:

It is true that a few investigators have reported the presence of a diaphragm in some of the glomerular endothelial fenestrations but this is a very uncommon finding and most have been in animal kidneys. For example, Rhodin's investigations quoted by Dr Duffy, were carried out on the mouse and I do not know of any nephrologist who believes that diaphragms can be found as a normal regular feature in the glomeruli, in spite of a number of purposeful searches. Dr Duffy's electron micrographs certainly suggest that the arrowed fenestration might well contain a diaphragm but in the others the central node does not resemble that found in a true diaphragm, being more diffuse and in some cases almost filling the fenestration. I wonder whether this might be a manifestation of Berger's disease in which the IgA deposits are said occasionally to extend to the subendothelial region.

Dr Duffy's idea of a controllable form of iris diaphragm is ingenious but it is difficult to explain why diaphragms are never (or hardly ever) found in the glomeruli whereas they are constantly present in the endothelium of adjacent peritubular capillaries in the same section.

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