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INTRODUCTION

The work which formed the basis of this thesis was carried out during a 5 year period in the Department of Pathology at the University of Adelaide. In this time I held an honorary appointment in the Pathology Section of the Royal Adelaide Hospital and performed 700 autopsies on patients from the wards of this institution which is, at present, the only large general teaching hospital in South Australia. The study of material from this source allowed me to develop an interest in the structure of the renal glomerulus and the changes produced in it by disease.

With the introduction of techniques for cutting very thin histological sections, it became possible to use the electron microscope not only to examine cellular features at higher magnifications than previously, but to see structures beyond the resolution of the light microscope. It was hoped that the electron microscope would substantiate or modify previous conceptions of cellular morphology and furthermore, add to its detail. This expectation has certainly been fulfilled. However, difficulties in interpretation arose not only from the novelty of
appearances at high magnification but from the
imperfect knowledge of structural alterations
produced by different fixatives used under variable
conditions. In other words, it was not always easy
to decide what was real and what was fixation
artefact.

Nevertheless, as certain aspects of glomerular
structure had not been resolved by classical methods
of examination and because initial studies with the
electron microscope were hampered by inadequate
techniques of fixation and embedding, further
observations of the normal mouse glomerulus were made
and the findings recorded in Part I, Chapter 1 to 4.

It was found possible to produce diffuse
glomerular lesions in mice by injecting them with
"nephrotoxic" antikidney serum and these changes were
studied with the light and electron microscopes. The
experiments were performed simply to observe the type
of structural alteration produced by the method and
no claim is made that the lesions were necessarily the
result of a specific, immune glomerular reaction or
that they were the homologue of human glomerulonephritis or nephrosis. This forms Part I, Chapters
5 to 7 of the thesis.
Part II contains an extensive historical survey of diabetic glomerulosclerosis and my experience of the condition resulting from the study of the records (clinical and pathological) and the kidney sections of patients dying at the Royal Adelaide Hospital. During its compilation I performed autopsies on 51 diabetic patients, and although little new knowledge resulted the work was almost entirely my own.

The appendices contain an analysis of kidney diseases in 241 autopsies and an account of glomerular lesions in patients dying with malignant hypertension, glomerulonephritis and polyarthritis nodosa.