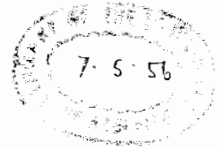


THE RENAL GLOMERULUS

OBSERVATIONS ON ITS MORPHOLOGY IN HEALTH AND DISEASE WITH PARTICULAR REFERENCE TO DIABETIC GLOMERULOSCLEROSIS

by

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CONTENTS

Introduction

PART I

The Structure of the Normal Mouse Glomerulus
shown by the Electron Microscope

Chapter I		
	Historical Background	4.
Chapter II		
	Previous Electron Microscopic Studies	11.
Chapter III		
	Electron Microscopic Study Methods	18.
Chapter IV		
	Results	21.
	Summary	33.
A Study of Changes produced in the Mouse Glomerulus by "Nephrotoxic" Serum		
Chapter V		
	History	36.
Chapter VI		
	Material and Methods	46.
	Results	47.
	Glomerular Histology	52.
Chapter VII		
	Electron Microscopic Findings	54.
	Summary	58.

PART II

Diabetic Glomerulosclerosis. A Study of the Incidence, Morphology and associated Renal Lesions

Chapter I		
An Historical Account		60.
Chapter II		
Material and Methods		83.
Incidence of Glomerulosclerosis		85.
Sex Incidence		86.
Age Incidence		87.
Oedema and Albumenuria		88.
Chapter III		
Associated Renal Disease		92.
Duration of Diabetes		95.
Causes of Death		98.
Glomerulosclerosis in Non-Diabetics		100.
Fibrinoid (exudative) Lesions		101.
Morphology and Staining of Glomerulosclerosis		104.
Chapter IV		
Case Reports		109.
Conclusions		123.
Appendices I to IV		125 to 153.
References		

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" ant kidney 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 polyarteritis nodosa.