Contents

	Preface page	vii
1.	Introduction	1
	1.1. Preliminaries	1
	1.2. Some examples	2
	1.3. Some complications	15
	1.4. General plan of the monograph	16
2.	The Poisson Process	17
	2.1. Definition and examples	17
	2.2. Properties of the Poisson process	20
	2.3. Inference about the parameter of a single Poisson process	29
3.	Analysis of Trends	37
	3.1. Introduction	37
	3.2. Regression analysis	39
	3.3. More specialized methods	45
	3.4. Exponential ordered scores	54
4.	Stationary Point Processes	59
	4.1. Introduction	59
	4.2. General considerations: the forward recurrence time	60
	4.3. Fundamental relationship between counts of events and	
	times between events	65
	4.4. Second-order properties of times between events	69
	4.5. Second-order properties of counts	72
	4.6. Miscellaneous relationships	75
	4.7. Examples of stationary point processes	78
5.	Estimation of Second-Order Properties of Stationary Pro-	
	cesses	85
	5.1. Introduction	85
	5.2. Estimates of first and second-order moments of intervals	87
	5.3. Estimates of the spectrum of intervals	96
	5.4. Estimates of first and second-order moments of counts	112
	5.5. Estimation of the spectral density of the counting process	124

CONTENTS

6.	Renewal Proce	esses and Some Related Significance Tests	134
	6.1. Introduct	ion	134
	6.2. General co	onsiderations for renewal processes	135
		Poisson processes	152
	6.4. Tests for r	enewal processes	164
	6.5. General te	ests of goodness-of-fit	171
7.	Generalization	s of Renewal Processes	179
	7.1. Introduction		
	7.2. Doubly stochastic Poisson processes		
	7.3. Wold's Ma	arkov process of intervals	183
	7.4. Branching	renewal processes	186
	7.5. Semi-Marl		194
	7.6. Events dis	splaced by random deviations	204
8.	Superposition of Processes		210
	8.1. Introduct	ion	210
	8.2. Some prob	pabilistic results	212
	8.3. Statistical analysis		
9.	Comparison of Rates of Occurrence		223
	9.1. Introduction		223
	9.2. Comparison of two Poisson processes		
	9.3. Comparison of several Poisson processes		231
	9.4. Compariso	on of rates in non-Poisson processes	239
10.	Some Generali	zations	245
	10.1. Introduction		
	10.2. Events in several dimensions		
	10.3. Events o	f several types	246
	Appendix I:	Some sets of data	251
	Appendix II:	Asymptotic significance points for some distri-	
		bution-free statistics	258
	Appendix III:	Exercises and further results	259
	Appendix IV:	References	268
	Author Index		277
	Subject Index		279