## Table of Contents

CHA	APTER	PAGE
	Introduction	ix
	PART ONE-WHAT SCIENCE PRESUPPOSES	
1	Language	3
	Problems of Language	3
	The Defense of Vague Language	5 8
	The Language of Science	
	The Language of Philosophy	8
	A Very Important Word	12
2	Mathematics	14
	What Mathematics Is Not	14
	What Mathematics Is	18
	The Relation of Mathematics to Science	22
	Pure vs. Applied Mathematics	29
	Can All Sciences Use Mathematics?	33
3	Assumptions	36
	The Law of Nature	36
	The Need for Assumptions	41
	Various Types of Assumptions	44
	Causal Laws	47
	Other Forms for Laws	53
	Factual Assumptions	57
	Uniformity of Nature	59
4	Probability	65
_	There Are Two and a Half Schools of Thought	65
	The Frequency Concept	69

Table of	Contents
----------	----------

	•
v	1

CHA	CHAPTER	
	Statistical Laws	72
	The Theory of Errors	75
	The Great Dispute	80
	Part Two-SCIENCE	
	FARI I WO—SCIENCE	
5	Тне Метнор	85
	The Cycle	85
	Facts vs. Theories	89
	Induction	93
	Deduction	96
	<b>Ver</b> ification	99
	A Case History	101
6	CREDIBILITY AND INDUCTION	105
	The Problem of Explication	105
	The Daily Use of "Credibility"	109
	Rules of Induction	112
	Positing and Eliminating	115
	The Justification of Induction	120
7	Concepts of Science	122
•	Types of Concepts	122
	Operationalism	125
	Fictitious Concepts	131
	Rules of Interpretation	134
	Concept Formation	138
8	Measurement	141
	Classification	142
	Partial Orders	145
	Simple Orders	148
	Numerical Scales	150

	Table of Contents	vii
CH.	APTER	PAGE
9	SCIENTIFIC EXPLANATIONS	156
	Good Explanations	156
	Bad Explanations	158
	Incomplete Explanations	162
	Explanations vs. Predictions	164
	The Hierarchy of Explanations	167
	The Role of "Purpose" in Explanations	169
10	WHAT IS SCIENCE?	174
	What Unites Science	174
	What Divides Science	178
	Reasons for Dividing Science	180
	PART THREE-PROBLEMS RAISED BY SCIENCE	Œ
11	Determinism	187
	Metaphysical Determinism	187
	Predicting the Future	188
	Two Related Topics	192
12	Life	195
	The Limitations of Science	195
	Evolution	196
	The Opposition	200
	Criteria for an Adequate Theory of Evolution	206
	Reduction of a Branch of Science	207
	Mechanism vs. Vitalism	211
13	THE MIND	217
•	The Traditional Divisions	217
	The Scientist's Attitude	219
	Thinking Machines	220
	Free Will	<b>2</b> 25
	Are Human Actions Predictable?	227

Table o	of (	Contents
	Table	Table of

CHAPTER	PAGE
14 Science and Values	230
Value Statements	230
The Factual Basis of Val	ue Statements 232
Ends and Means	237
A Complete Scale of Value	1es 239
15 THE SOCIAL SCIENCES	244
The Status of the Social S	Sciences 244
Method in the Social Science	ences 247
An Example	252
The Future of the Social	Sciences 256
16 Quo Vadis?	<b>2</b> 59
Bibliography	265
Index	271