

CONTENTS

FOREWORD

page vii

PART I. CONSERVATION OF QUANTITIES AND INVARIANCE OF WHOLES

I. CONSERVATION OF CONTINUOUS QUANTITIES	3
§1. <i>Technique and general results</i>	4
§2. <i>Stage I. Absence of conservation</i>	5
§3. <i>Stage II. Intermediary reactions</i>	13
§4. <i>Stage III. Necessary conservation</i>	17
II. CONSERVATION OF DISCONTINUOUS QUANTITIES AND ITS RELATION TO ONE-ONE CORRESPONDENCE	25
§1. <i>Stage I. Absence of conservation</i>	25
§2. <i>Stage II. Beginnings of construction of permanent sets</i>	29
§3. <i>Stage III. Conservation and quantifying co-ordination</i>	33

PART II. CARDINAL AND ORDINAL ONE-ONE CORRESPONDENCE

III. PROVOKED CORRESPONDENCE AND EQUIVALENCE OF CORRESPONDING SETS	41
§1. <i>One-one correspondence between glasses and bottles</i>	42
§2. <i>Correspondence between flowers and vases and between eggs and egg-cups</i>	49
§3. <i>One for one exchange of pennies and objects</i>	56
§4. <i>One for one exchange in conjunction with counting aloud</i>	61
IV. SPONTANEOUS CORRESPONDENCE—CARDINAL VALUE OF SETS	65
§1. <i>Reproduction of figures</i>	66
§2. <i>Single rows</i>	74
§3. <i>Conclusions</i>	85
V. SERIATION, QUALITATIVE SIMILARITY AND ORDINAL CORRESPONDENCE	96
§1. <i>Technique and general results</i>	97
§2. <i>Construction of serial correspondence (qualitative similarity)</i>	99
§3. <i>From serial correspondence to ordinal correspondence</i>	106
§4. <i>Reconstruction of cardinal correspondence</i>	114

	<i>page</i>
VI. ORDINATION AND CARDINATION	122
§1. <i>The experiment with sticks and the problem of seriation</i>	123
§2. <i>The experiment with cards forming a staircase</i>	134
§3. <i>The experiment with mats and hurdles</i>	139
§4. <i>Conclusions: ordination and cardination</i>	147
PART III. ADDITIVE AND MULTIPLICATIVE COMPOSITIONS	
VII. ADDITIVE COMPOSITION OF CLASSES—	
RELATIONS BETWEEN CLASS AND NUMBER	161
§1. <i>Technique and results</i>	162
§2. <i>Stage I. Absence of additive composition</i>	164
§3. <i>Stages II and III. Progressive reversibility of operations</i>	175
§4. <i>Number, and additive composition of classes</i>	181
VIII. ADDITIVE COMPOSITION OF NUMBERS AND	
ARITHMETICAL RELATIONS OF PART TO WHOLE	185
§1. <i>Technique and results</i>	185
§2. <i>Relations between parts and whole, and changes in composition of parts</i>	187
§3. <i>Equating of quantities</i>	190
§4. <i>Division into equal parts</i>	195
§5. <i>Conclusion</i>	198
IX. CO-ORDINATION OF RELATIONS OF EQUIVALENCE AND MULTIPLICATIVE COMPOSITION OF NUMBERS	203
§1. <i>Constitution of one-one correspondence and composition of relations of equivalence</i>	204
§2. <i>Stages of composition of relations of equivalence</i>	209
§3. <i>Multiple correspondence and numerical multiplication</i>	213
§4. <i>Conclusion: multiplication of classes and numbers</i>	219
X. ADDITIVE AND MULTIPLICATIVE COMPOSITION OF RELATIONS AND EQUALIZATION OF DIFFERENCES	221
§1. <i>Problems and results</i>	222
§2. <i>Development of the notion of measure</i>	223
§3. <i>Composition of relations and of numerical units</i>	230
§4. <i>Conclusions</i>	240
GLOSSARY	244
INDEX	245