

CONTENTS

.....	vii
Part I — Introductory/Tutorial/Survey Papers	
Completeness and mathematical proof, <i>Scientific American</i> , 1975	3
The difficulty of computations, <i>IEEE Transactions on Information Theory</i> , 1970	14
Information-theoretic computational complexity, <i>IEEE Transactions on Information Theory</i> , 1974	23
Algorithmic information theory, <i>Encyclopedia of Statistical Sciences</i> , 1982	33
Algorithmic information theory, <i>IBM Journal of Research and Development</i> , 1977	38
Part II — Applications to Metamathematics	
Gödel's theorem and information, <i>International Journal of Theoretical Physics</i> , 1982	55
Completeness and Gödel's theorem, <i>Proceedings 1985 Solvay Conference</i> , in press	66
Algebraic equation for the halting probability, <i>The Universal Turing Machine</i> , in press	70
Computing the busy beaver function, <i>Open Problems in Communication and Computation</i> , in press	74
Part III — Applications to Biology	
A mathematical definition of "life", <i>ACM SIGACT News</i> , 1970	79
Toward a mathematical definition of "life", <i>The Maximum Entropy Formalism</i> , 1979	86
Part IV — Technical Papers on Self-Delimiting Programs	
Theory of program size formally identical to information theory, <i>Journal of the ACM</i> , 1975	107
Completeness theorems for random reals, <i>Advances in Applied Mathematics</i> , 1987	123
Algorithmic entropy of sets, <i>Computers & Mathematics with Applications</i> , 1976	147
Part V — Technical Papers on Blank-Endmarker Programs	
Information-theoretic limitations of formal systems, <i>Journal of the ACM</i> , 1974	165
Note on Monte Carlo primality tests and algorithmic information theory, <i>Communications on Pure and Applied Mathematics</i> , 1978	191
Information-theoretic characterizations of recursive infinite strings, <i>Theoretical Computer Science</i> , 1976	197
Program size, oracles, and the jump operation, <i>Osaka Journal of Mathematics</i> , 1977	201

