# Contents


| | |
|---|---|
| **Preface** | v |
| **1 General Introduction** | 1 |
| 1.1 Background | 1 |
| 1.2 Some Definitions | 2 |
| 1.3 Types of Identification Method | 3 |
| 1.4 Hierarchies, Trees and Keys | 3 |
| 1.5 Pattern Recognition | 9 |
| **2 Conventional Identification Methods** | 11 |
| 2.1 Diagnostic Keys | 11 |
| 2.1.1 Use | 11 |
| 2.1.2 Construction | 15 |
| 2.1.3 Other forms | 22 |
| 2.1.4 Theory | 26 |
| 2.1.5 Multi-access keys on punched cards | 28 |
| 2.2 Identification by Comparison | 32 |
| 2.2.1 Tabular methods | 33 |
| 2.2.2 Mechanical methods | 36 |
| **3 Automatic Identification Methods** | 37 |
| 3.1 Computational Background | 37 |
| 3.1.1 Advantages and disadvantages of computers | 37 |
| 3.1.2 Data format | 38 |
| 3.1.3 Estimates of the usefulness of characters | 43 |
| 3.2 Key-constructing Programs | 45 |
| 3.2.1 Program logic | 45 |
| 3.2.2 The figure of merit | 47 |
| 3.2.3 Programming details | 50 |
| 3.3 Punched Card Keys | 53 |
| 3.4 Matching Methods | 55 |
| 3.4.1 Measures of likeness | 55 |
| 3.4.2 Probabilistic methods | 62 |
| 3.5 On-line Identification programs | 68 |
| 3.6 Character Set Minimization | 73 |
| 3.7 Continuous Classification and Identification | 77 |
| 3.8 Special Techniques for Identification | 78 |
| 3.9 Comparison of Methods | 78 |
| 3.10 Special Kinds of Specimen | 80 |

**4 History of Identification Methods** 82

**5 Applications** 88
5.1 Botany 89
5.2 Zoology 89
5.3 Palaeontology 90
5.4 Microbiology 90
5.5 Pharmocognosy 91
5.6 Medical Diagnosis 92
5.7 Summary 93

**References** 95

**Index** 101