

Contents

1	The Classes of Natural Product and Their Isolation	1
1.1	Introduction	1
1.2	The Classes of Secondary Metabolites	2
1.3	Polyketides and Fatty Acids	3
1.4	Terpenes and Steroids	6
1.5	Phenylpropanoids	15
1.6	Alkaloids	18
1.7	Antibiotics Derived from Amino Acids	22
1.8	Vitamins	22
1.9	Chemical Ecology	24
1.10	The Isolation of a Natural Product	28
1.11	The Stages in Structure Elucidation	30
2	The Characterization and Determination of the Carbon Skeleton of a Natural Product	35
2.1	The Characterization of a Natural Product	35
2.2	Spectroscopic Characterization	37
2.3	Simple Chemical Derivatives	45
2.4	The Determination of the Carbon Skeleton	46
2.5	Spectroscopic Methods in the Determination of the Carbon Skeleton	57

3	The Location of the Functional Groups and the Molecular Stereochemistry	63
3.1	Introduction	63
3.2	Spectroscopic Interrelationships	64
3.3	Chemical Methods	69
3.4	The Determination of Absolute Stereochemistry	75
4	Some Examples of Structure Elucidation	85
4.1	Santonin	85
4.2	Griseofulvin	89
4.3	Penicillin and Clavulanic Acid	93
4.4	Prostaglandins	96
4.5	Vitamin C	98
5	The Biosynthesis of Secondary Metabolites	105
5.1	Introduction	105
5.2	Biosynthetic Methodology	105
5.3	The Pathway of Carbon into Biosynthesis	107
5.4	The Biosynthesis of Polyketides	108
5.5	Terpenoid Biosynthesis	112
5.6	The Biosynthesis of Phenylpropanoids	119
5.7	Alkaloid Biosynthesis	121
5.8	Other Natural Products Derived from Amino Acids	124
	Further Reading	131
	Answers to Problems	135
	Subject Index	145