

Geoffrey H. Baker

second edition

Design Strategies in Architecture

an approach to the analysis of form

DESIGN STRATEGIES IN ARCHITECTURE

an approach to the analysis of form

Geoffrey H. Baker
School of Architecture,
Tulane University, New Orleans

second edition

VAN NOSTRAND REINHOLD
I(T)P™ A Division of International Thomson Publishing Inc. 

New York • Albany • Bonn • Boston • Detroit • London • Madrid • Melbourne
Mexico City • Paris • San Francisco • Singapore • Tokyo • Toronto

E & FN SPON
An Imprint of Chapman & Hall
London • Weinheim • New York • Tokyo • Melbourne • Madras



Published by E & FN Spon, an imprint of Chapman & Hall, 2-6 Boundary Row, London SE1 8HN, UK

Chapman & Hall, 2-6 Boundary Row, London SE1 8HN, UK

Chapman & Hall GmbH, Pappelallee 3, 69469 Weinheim, Germany

Chapman & Hall USA, 115 Fifth Avenue, New York, NY 10003, USA

Chapman & Hall Japan, ITP-Japan, Kyowa Building, 3F, 2-2-1 Hirakawacho, Chiyoda-ku, Tokyo 102, Japan

Chiyoda-ku, Tokyo 102, Japan

Chapman & Hall Australia, 102 Dodds Street, South Melbourne, Victoria 3205, Australia

Chapman & Hall India, R. Seshadri, 32 Second Main Road, CIT East, Madras 600 035, India

Distributed in the USA and Canada by Van Nostrand Reinhold, 115 Fifth Avenue, New York, NY 10003, USA

First published in 1989 by Van Nostrand Reinhold (International) Co. Ltd

Reprinted 1991, 1993

Second edition 1996

© 1989 E & FN Spon

© 1996 Geoffrey Baker

Printed in Great Britain by St Edmundsbury Press Ltd, Bury St Edmunds, Suffolk.

ISBN 0 419 16130 9 (E & FN Spon)

Apart from any fair dealing for the purposes of research or private study, or criticism or review, as permitted under the UK Copyright Designs and Patents Act, 1988, this publication may not be reproduced, stored, or transmitted, in any form or by any means, without the prior permission in writing of the publishers, or in the case of reprographic reproduction only in accordance with the terms of the licences issued by the Copyright Licensing Agency in the UK, or in accordance with the terms of licences issued by the appropriate Reproduction Rights Organization outside the UK. Enquiries concerning reproduction outside the terms stated here should be sent to the publishers at the London address printed on this page.

The publisher makes no representation, express or implied, with regard to the accuracy of the information contained in this book and cannot accept any legal responsibility or liability for any errors or omissions that may be made.

A catalogue record for this book is available from the British Library

ACKNOWLEDGEMENTS

This book draws together a selection of analytical material produced over two decades by myself and by students under my direction. I must give special mention to Simon Buckley, whose perceptive analyses of Markworth, Sierra and Assisi¹ have formed the basis of these studies in part two.

I am also indebted to Jeremy Blake, who has made an important contribution to the analysis of the Town Hall at Sigmarsålo, and to students of the School of Architecture at the University of Arkansas who produced useful analytical work during my period of teaching at Fayetteville. All these studies have informed my research.

I must also thank Gordon Brooks for his coordination of the computer modelling which helped me to draw the diagrams of Richard Meier's Athenaeum, and Beth Leaford and Chad Fabby who generated the computer images.

Although their work is not discussed in this book, and analyses of their buildings were done without consultation, I must thank Peter Alwends, Richard Burton and Paul Koralek for invaluable feedback which has influenced the development of the analytical methodology.

Thanks are due to Ellen Weiss for help with the manuscript, and Margaret Hudson, Christine Hiker and Jean Middleton, librarians at the Universities of Newcastle-upon-Tyne, the University of Arkansas and Brighton Polytechnic, for all their help.

¹ Symbolism, situation and architecture: shifting emphases in making places' Dissertation by Simon Buckley at the University of Newcastle-upon-Tyne, 1971.

² Athenaeum: Analysis of Form, video, written and presented by Geoffrey Baker and produced by Gordon Brooks at the University of Arkansas, 1980.

PREFACE TO THE SECOND EDITION

As those who study and practice it will know, architecture is a complex and wide-ranging discipline. In this introductory reader, one of my tasks has been to select, from a myriad of issues, those that will hopefully prove most enlightening to those seeking to fathom its mysteries.

In a book such as this, brevity is important, the summary is necessary, and visual information has a special role. 'Headlining' and the double page spread are each intended to help effective communication, bearing in mind the purpose of the book and its readership.

In this second edition I have added a section that outlines the relationship between some current perceptions of science, art and philosophy, and how these impinge on architecture. As throughout the book, vast areas of knowledge have been distilled to form very short summaries.

I am well aware of my inability to do justice to such profundities by such an abbreviated approach, but as my purpose generally is to introduce subject areas, I hope some doors will have been opened that will tempt the reader beyond.

Geoffrey H. Baker, New Orleans, April 1996.

FOREWORD

I was surprised and delighted when Geoffrey Baker's analysis of our design for the National Gallery extension appeared in *Architectural Design* (January and February editions, 1987), and I am pleased he has included it in this publication.

I felt he had 'understood' most of the formal design moves we made in evolving the scheme — indeed he interpreted several design subtleties which I only felt intuitively, and until his exposition had not fully perceived. It seems he is able to clarify and describe a work of Modern Architecture in ways that others such as Wittkower have been able to do for historic buildings.

Surely his method and skill in explaining the design intentions which lead to the appearance of a new building is of more value to the public than the gratuitous jottings of the architectural journalists, who seem always (in the U.K.) to be writing from predetermined and irrelevant viewpoints. An exception (in the U.S.) is Ada Louise Huxtable who is able to visit a building without dragging behind her a sackful of prejudices.

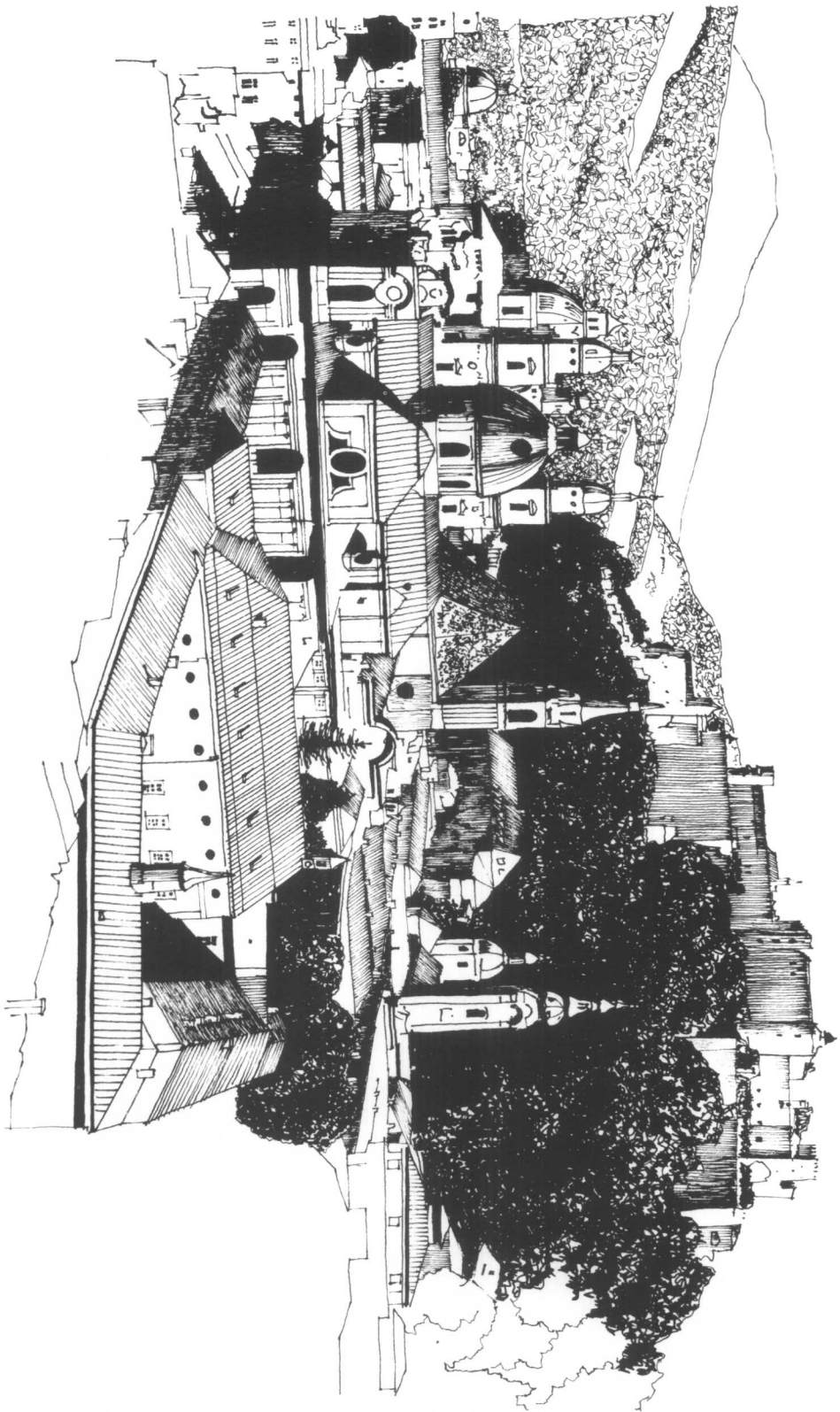
Dr. Baker's article on the National Gallery project was like a breeze of fresh air, and I believe his ability to analyze and explain an architect's formal ambitions en route to a building form should be a basic credential and a responsibility for architectural writers, and should form a foundation for their criticism.

So I hope that Dr Baker's skill will be appreciated by a new generation of architectural critics, that they will have a deeper and more sophisticated understanding of the design process related to a particular building, and that they will be able to communicate this to the intelligent reader who is surely striving to understand Modern Architecture.

For architectural students this publication is, of course, essential study matter.

James Stirling.

Salzburg : view of the city and castle



PROLOGUE

Unlike painting, music or literature, architecture is of the earth. It belongs to the ground as a container for the activities of man and as such is part of his very existence. This intrinsic link is evident in the basic need for shelter—buildings give shelter and in so doing engage architecture in man's survival against the hostile forces of nature.

Architecture therefore becomes involved in emotional and practical needs that are quite different to the needs that are met by technology. A car, a radio, a TV, are not necessary in the way that buildings are, so architecture has a different role and can represent significant areas of life. Although concerned with space, form and the satisfaction of functional demands, arguably architecture's primary role is symbolic. Alone among the arts it can express the idea of government, the church or the monarchy—it can also symbolize home.

So architecture is quite distinct from the other arts, which can all be dispensed with. We can remove a painting, choose when to listen to music, leave a book on a shelf. Architecture is not like that because it creates not only the framework for personal or family life, it creates the framework for national life and thereby represents the prime characteristics of a culture.

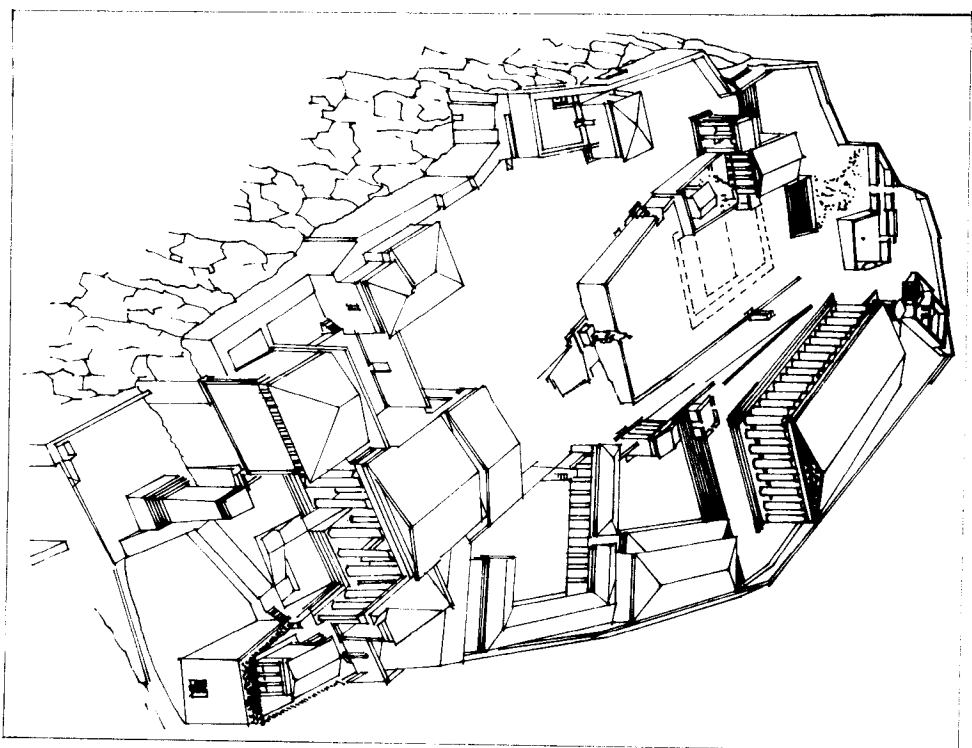
A civilization can best be understood by its architecture because of the way buildings show the interests of a society, its organizational skills, affluence or poverty, the kind of climate and the attitude towards technology and the arts. In towns and cities the general structure of society can be understood through the medium of architecture, so it becomes the most pervasive mirror of man's presence.

Importantly, and again unlike the other arts, architecture exists in relation to two sets of conditions; on the one hand buildings must respond to fundamental issues such as the need for shelter and for ideas to be symbolized, whilst on the other they must relate to a region, to a specific location, to topography, to the path of the sun, to variations of temperature, to the movement of people.

How then can architecture be understood? How can it be examined? To what, primarily does it respond? Broadly speaking, there are three key factors which affect architecture; buildings must respond to site conditions, functional requirements, and to the culture in which they find themselves. Regarding the latter, the state of advancement of the culture will affect the kind of structure and materials used. To understand buildings, all three of these factors must be taken into account and this becomes possible by analysis.

In any analysis of architecture it is convenient to consider the various factors as forces, and to begin with, because buildings are set on the ground, the topography should be examined. Here the forces are clearly apparent — a river is a force, a road is a force, a hill is a force, trees are a force, the climate is a force — and there are many subtle gradings of these forces.

Similarly, taking the second key factor outlined above, in satisfying functional needs, the organization of a building may also be considered in terms of its force characteristics. Form may be either linear or centroidal, static or dynamic. A tower for example may be thought of as a dynamic vertical force or a bridge as a static horizontal force, a castle may be seen as a centroidal defensive force.



The third important factor which affects architecture is the force exerted by a culture. In Ancient Greece a particular culture evolved in relation to a special set of circumstances at a particular time. Attitudes developed in the areas of religion, philosophy, science, mathematics technology and art which led to an architecture which represented the main ideas of the culture.

Although we can understand the Greek civilization through the combined media of say art, philosophy and literature, architecture, by its special role draws these together so that they become embodied in buildings. The cultural forces are encapsulated in the architecture and it is not coincidental that this architecture and the cultural values which it represents have endured to the present day.

This crystallization of cultural forces in buildings has happened throughout history and in our own time the glass skyscraper represents vital features of the twentieth century, symbolizing our technological capacity and key concerns such as did the pyramids, the Greek temple or Gothic cathedral.

Athens : The Acropolis

A reconstruction according to G.P. Stevens

In the richness and experience of a lifetime, ideas and principles... begin to be a source of freedom and power... now you are released by way of glass and the cantilever and the sense of space which becomes operative. Now you are related to the landscape... You are as much a part of it as the trees, the flowers, the ground; you can pick up the earth and the sky. You are now free to become a natural feature of your environment and that, I believe, was intended by your Maker.¹

My prescription for a modern house: first a good site. Pick one that has features making for character... then build your house so that you may still look from where you stood upon all that charmed you and lose nothing of what you saw before the house was built, but see more.

Architectural association accentuates the character of the landscape if the architecture is right.²

¹ Frank Lloyd Wright, a talk given to the Fellowship, quoted in Olgivanna Lloyd Wright, Frank Lloyd Wright: His Life, His Work, His Words, Filman, 1970, pp. 159-60

² Frank Lloyd Wright, In the Realm of Ideas Edited by Bruce Brooks Pfeiffer and Gerald Norland, Southern Illinois University Press, Carbondale and Edwardsville, 1988, p 44.

CONTENTS

ACKNOWLEDGMENT.....	xii
PREFACE TO THE SECOND EDITION.....	xiii
FOREWORD.....	xiv
PROLOGUE.....	xvii
PART ONE : PRINCIPLES OF ANALYSIS	
I THE ROLE OF ARCHITECTURE..... 3	
FORCES.....	4
GENIUS LOCI.....	5
NATURE.....	6
ART.....	7
ART AS SYMBOL.....	8
POETRY.....	10
MEANING IN USE.....	12
PRIMITIVE ARCHITECTURE.....	14
VERNACULAR ARCHITECTURE.....	15
MONUMENTAL ARCHITECTURE.....	16
HIGH ART.....	17
CULTURE.....	18
STATUS.....	19
PROGRAMME AND SITE.....	20
ORIENTATION AND IDENTITY.....	21
MOVEMENT.....	22
VIEWS.....	24
STRUCTURE.....	26
GEOMETRY.....	30
SUMMARY.....	32
2 ASPECTS OF FORM..... 37	
ARCHITECTURE AND CULTURE.....	38
ETHNIC DOMAIN.....	39
TENSION AND HARMONY.....	40
PERMANENCE AND HARMONY.....	42
HARMONY AND GEOMETRY.....	44
GEOMETRICAL DESIGN.....	46
CENTROIDAL STATIC.....	48
LINEAR DYNAMIC.....	49
CHARTRES.....	50
DYNAMISM.....	51
FORCES.....	52
ORGANIZATION.....	53
COMPLEXITY AND CONTRADICTION.....	54
THE DYNAMIC ENERGY OF FORM.....	56
ALVARO ALTO.....	57
THE CLASSIC WORK.....	58
3 THE ANALYSIS OF ARCHITECTURE..... 63	
ANALYSIS.....	64
DIAGRAMMATIC THOUGHT.....	66
SLAB TRANSFORMED.....	68
GENERIC AND SPECIFIC FORM.....	70
LA TOURRETTE.....	71
CARTESIAN GRID AND HORIZONTAL ABSOLUTE.....	72
MASS AND SURFACE.....	74
ARTICULATION OF THE MASS.....	75
CENTROIDAL AND LINEAR FORM.....	76

DYNAMICS OF FORM.....	77
CORE SYSTEMS.....	78
LINEAR SYSTEMS.....	79
AXIAL SYSTEMS.....	80
ECHELON AND RADIAL SYSTEMS.....	81
INTERLOCKING SYSTEMS.....	82
FORM DISTORTION.....	83

PART TWO : ANALYTICAL STUDIES

4 THE VILLAGE AND CITY IN HISTORY.....	87
MONASTIC COMPLEX AT ASSISI.....	89
PROBLEM AND SITE.....	91
GENERIC FORM.....	92
SPECIFIC FORM.....	94
FORM AS SIGNAL.....	96
FORM AS SYMBOL.....	97
MARKWORTH NORTHUMBERLAND.....	99
GENIUS LOCI AND SITE FORCES.....	102
CULTURAL FACTORS AND MATERIALS.....	104
LAYOUT.....	105
RELEVANT ISSUES.....	106
CAMPO AND CATHEDRAL SIENA.....	109
CULTURE AND SITE.....	111
TOPOGRAPHY AND ROUTES.....	114
CAMPO.....	116
DIAGONAL AXIS.....	118
PALAZZO PUBBLICO.....	120

TORRE DEL MANQIA.....	121
FOCUS.....	122
ROUTES.....	124
CATHEDRAL.....	126
THE PIAZZA OF SAN MARCO VENICE.....	129
SITE FORCES.....	130
ROUTES.....	131
ORIGINS.....	132
SITE FACTORS.....	133
ELEMENTS COMBINED.....	136
CENTROIDAL MASS.....	138
EXOTIC DOMINANCE.....	139
INTERLOCKING CONTRASTING MASSES.....	140
CIRCULATION NETWORK.....	141
MOVEMENT.....	142
OBLIQUE PLANE.....	143
ENCLOSURE.....	144
POSITIVE/NEGATIVE OBLIQUE/ORTHOGONAL.....	145
PIAZZA.....	146
PIAZZETTA.....	147
MOVEMENT.....	148
FROM MOLO TO PIAZZA.....	149
VIEWS.....	150
INTERPRETATION.....	152
5 ANALYTICAL STUDIES OF BUILDINGS.....	157

ALVAR AALTO — TOWN HALL	
AT SAYNATJALO 1950 — 61	159
ALVAR AALTO	160
ITALY AND FINLAND	162
SITE FORCES	164
CENTROIPAL MASS	165
GENERIC FORM	166
EFFECTS OF SLOPE	167
CENTROID FRACTURED	168
ACCESS	169
COUNCIL CHAMBER	170
SPIRALS	171
FLOW	172
SALIENT ISSUES	173
DIAGONALS	174
STABILIZING ELEMENTS	175
COUNCIL CHAMBER	176
BOX TRANSFORMED	177
ENERGY	178
COUNCIL CHAMBER	179
PERCEPTUAL FACTORS	180
CONCEALMENT AND MYSTERY	182
DISCOVERY BEYOND	183
BOLD AND DEFIANT	184
LIGHTING	185
RICHARD MEIER — THE	
ATHENIUM NEW HARMONY 1975-79	187
RICHARD MEIER	189

THE SMITH HOUSE	190
PROGRAMME	191
SITE FORCES	192
ZONES	193
ORTHOGONAL GRID	194
FUNCTIONAL GRID	195
VISUAL RANGE	196
AUDITORIUM	197
RAM P	198
TILTED AXIS	199
ROUTES	200
STAIR AND SCREEN	201
SQUARE OVERLAY	202
SCREEN AND STAIR	203
APPROACH	204
ENTRANCE	205
HOVERING PLANES	206
DYNAMIC CORNER	207
CURVED GALLERY	208
LIGHT WELL	209
WEST FACADE	210
SOUTH FACADE	211
PENETRATION TO SOUTH	212
ROUTE FRAMED	213
TRANSFORMATION OF BOX	214
PLANES AND SOLIDS	215
SQUARE IMPOSED	216
CURVED ADDITION	217

GROUND LEVEL.....	219
SECOND LEVEL.....	220
THIRD LEVEL.....	222
CASCADE AROUND CORE.....	223
VISUAL INTERLOCK.....	224
MOVEMENT SEQUENCE.....	225
MOVEMENT SEQUENCE 2.....	226
AUDITORIUM.....	228
THEME.....	230
JAMES STIRLING—EXTENSION TO	
THE NATIONAL GALLERY, LONDON	233
JAMES STIRLING.....	234
SITE FORCES.....	236
TRAFALGAR SQUARE.....	237
NATIONAL GALLERY AND	
HAMPION SITE.....	238
HAMPION SITE.....	239
NATIONAL GALLERY.....	240
THE EXTENSION.....	242
THEME.....	244
PAVILIONS.....	245
THE PAVILION.....	246
ENTRY.....	247
CANOPIES.....	248
CIRCULAR STAGE.....	250
SOUTH FACADE.....	252
DESIGN PRINCIPLES.....	254
PRIMARY FACADE.....	256
WEST FACADE.....	257

6

DISTORTION.....	258
MASS OR PLANES.....	260
SLIDING BOXES.....	262
MOVEMENT AND STRUCTURE.....	263
GALLERIES.....	264
LOWER LEVELS.....	266
SECTION.....	267
LIGHTING.....	268
ROUTE AND BANNER.....	269
DEVELOPED DESIGN.....	270
MASS EXPLODES.....	271
PAVILION TO PALAZZO.....	272
HISTORICAL REFERENCES.....	273
STAATSGALERIE, STUTTGART.....	274
DRUMS AND VISTA.....	275
SCULPTED FORMS AND SPACES.....	276
ENTRY.....	277
WEST ELEVATION.....	278
SOUTH ELEVATION.....	279
DESIGN STRATEGY.....	280
POST SCRIPTUM.....	283
SCIENCE PHILOSOPHY ART AND	
ARCHITECTURE	285
SCIENCE AND TECHNOLOGY.....	284
SCIENCE AFFIRMED.....	286
THE FUTURIST VISION.....	287
THE ARTIST AND THE SCIENTIST.....	288
HIGH TECH.....	289

VENTURI AND SCOTT BROWN.....	290
CULTURAL REINFORCEMENT.....	291
CONSTRUCTIVISM.....	292
THE CONSTRUCTIVISTS.....	294
ART AS LIBERATION.....	295
THE RATIONALISTS.....	296
VLADIMIR KRINSKY.....	298
ZAHA HADID.....	300
NEW TERRITORIES.....	301
DECONSTRUCTION.....	302
JACQUES PERKIDA.....	303
THE AVANT-GARDE.....	304
SYMBOLIC MISREADINGS.....	306
ART AND ARCHITECTURE.....	307
A PHENOMENOLOGY OF THE SOUL.....	308
THE POETICS OF THE HOUSE.....	309
SYMBOLS OF HOME.....	311
THE MIND OF THE UNIVERSE.....	312
THE FOURFOLD.....	313
GIFTS.....	314
AUTHENTIC EXISTENCE.....	315
CONCLUDING SUMMARY.....	316
CHRISTIAN NORBERG-SCHULZ.....	317
TO DWELL POETICALLY ON EARTH.....	318
ANTOINETTE PREDOCK.....	319