



University
of Glasgow

Kamel, Hassan Mohamed Hassan (1986) *The application of perception theory in architecture and urban design with particular reference to Liberation Square in Cairo*. PhD thesis.

Volume 1

<http://theses.gla.ac.uk/30640/>

Copyright and moral rights for this thesis are retained by the author

A copy can be downloaded for personal non-commercial research or study, without prior permission or charge

This thesis cannot be reproduced or quoted extensively from without first obtaining permission in writing from the Author

The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the Author

When referring to this work, full bibliographic details including the author, title, awarding institution and date of the thesis must be given

THE APPLICATION OF PERCEPTION
THEORY IN ARCHITECTURE & URBAN DESIGN

WITH PARTICULAR REFERENCE TO
LIBERATION SQUARE IN CAIRO

VOL. I

PH.D. Thesis submitted October 1986 to Mackintosh
School of Architecture - Glasgow University by
Hassan Mohamed Hassan Kamel

CONTENTS

PAGE NO.

LIST OF FIGURES	vii
LIST OF TABLES	xxiv
DEDICATION	xxv
ACKNOWLEDGEMENTS	xxvi
INTRODUCTION	1
CHAPTER 1: PERCEPTION & PHYSIOLOGY	8
1.1 The Eye	8
1.2 The Brain	13
1.3 Mechanism of Perception	19
CHAPTER 2: ASPECTS OF PERCEPTION	32
2.1 Perception in Life	32
2.2 Perception in Art/Architecture	38
2.3 The Limits of Perception in the Design Process	41
CHAPTER 3: THE ARCHITECTURAL ELEMENTS & PERCEPTION	49
3.1 The Principle of Unity	49
3.2 Perception of Colour	59
3.3 Perception of Light	69
3.4 Perception of Texture	77
3.5 Perception of Rhythm	86
3.6 Perception of Proportion	91
CHAPTER 4: THE DYNAMICS OF ARCHITECTURE	101
4.1 The Dynamics of Lines	101

4.2	The Dynamics of Forms	107
4.3	The Dynamics of Directions	113
4.4	The Dynamics of External Space	124
4.5	The Dynamics of Internal Space	128
4.6	Inside and Outside	132
4.7	The Visual Weight	137
4.8	The System of Motion	141
4.9	Symmetry & Dissymmetry	145
CHAPTER 5:	ARCHITECTURAL ASPECTS OF PERCEPTUAL CONNOTATION	152
5.1	The Expressionist Aspect	152
5.2	The Symbolism Aspect	161
5.3	The Aspect of Character	172
CHAPTER 6:	SEVENTH HEAVEN COMPETITION	185
6.1	Seventh Heaven 1	185
6.2	Seventh Heaven 1 & The Limits of Perception	209
6.3	Seventh Heaven 2	211
6.4	Seventh Heaven 2 & The Limits of Perception	224
6.5	Seventh Heaven 2 & The Egyptian Islamic Architecture	227
6.6	Seventh Heaven 2 & The Egyptian Architectural Islamic Criteria	235
6.7	The Validity of Constructing the Seventh Heaven in Old Cairo and The Limits of Perception	238
CHAPTER 7:	SQUARES IN THE HISTORY OF THE WORLD	245
7.1	The Story of the Square's Evolution	245

7.2	Historical Background of the Squares in Egypt.	297
CHAPTER 8:	THE SQUARE, ITS FUNCTION & ITS IDENTITY INSIDE THE CITY	314
8.1	The Definition of Space	314
8.2	The Biological & The Psychological Importance of Squares	327
8.3	The Square: Its Function & Its Importance in the City	334
8.4	The Traffic in the City & Its Impact on the Square Function	336
8.5	The Conservation Policy in the Squares	342
8.6	The Location of Squares within the Organism of Cities	346
8.7	The Confining Elements of the Square	356
CHAPTER 9:	PARLIAMENT SQUARE COMPETITION	364
9.1	Historical Background	365
9.2	The New Square as we Need It.	367
9.3	The Researcher's Entry	371
9.4	Parliament Square & The Limits Of Perception	381
CHAPTER 10:	APPROACH & METHODOLOGY	387
10.1	Perception & Methodology	387
10.2	Hypothesis to be Tested	389
10.3	The Questionnaire Design	392
CHAPTER 11:	LIBERATION SQUARE ANALYSIS	398
11.1	The Historical Evolution of Liberation Square	398

11.2	Liberation Square and How it Looks Today	409
11.3	The Function of the Square and How People Use It	412
11.4	The Potentiality of the Square and the Power of Its Components	428
11.5	The Square Buildings: Their Style; Character and Their Expression	441
11.6	The Square and the Pedestrians Bridge	453
11.7	The Landscape of the Square as a Recreational and Formative Element	456
11.8	The Square, Its Expressive and Symbolic Connotation	462
11.9	The Square and The Conservation Policy of Its Historical Buildings	469
11.10	The Square and The Structure of The City	473
11.11	Modern Cairo and The Design of The New Paris by Haussmann	480
11.12	Cairo's Spatial Structure and The Monumental and The High Buildings	486
CHAPTER 12:	CONCLUSION AND RECOMMENDATION	497
12.1	Conclusion	497
12.2	Liberation Square and The Limits of Perception	501
12.3	Recommendation of Relevance to Liberation Square	505
12.4	Proposal for Liberation Square	510
12.5	General Recommendations	512
APPENDIX A:	THE QUESTIONNAIRE	525

APPENDIX B:	SEVENTH HEAVEN COMPETITION 'SCHEME 1'	566
APPENDIX C:	SEVENTH HEAVEN COMPETITION 'SCHEME 2'	572
APPENDIX D:	PARLIAMENT SQUARE COMPETITION	583
BIBLIOGRAPHY		588

LIST OF FIGURESPAGE NO.

1.1	The human eye	10
1.2	The muscles of the eye	12
1.3	The brain	14
1.4	The human receptors	14
1.5	A nerve cell	16
1.6	Varied sections in the brain	17
1.7	The optic pathways of the brain	18
1.8	Body and perception	20
1.9	Fragments of an information unite	22
1.10	Principles of Engram Notation	24
1.12	Basic image of a house	26
1.13	Basic image of a church	26
1.14	The system of self maximisation	29
1.15	The visual array in perception	29
3.1	Unity by proximity	50
3.2	Unity of direction	50
3.3	Unity of direction	50
3.4	Kandinsky, several circles	50
3.5	Dominance & Unity	52
3.6	Church, Leningrad, USSR	53
3.7	Repetition & unity	53
3.8	Contrast & unity	55
3.9	Unity & repetition	55
3.10	The organic unity	58
3.11	Colour circle	60
3.12	Ostwald's colour wheel	60

	PAGE	
3.13	Munsell's colour wheel	60
3.14	Runges colour wheel	60
3.15	Colour and visual weight	64
3.16	Colour interval	64
3.17	The value scale	67
3.18	The dynamics of colour	67
3.19	Direction and speed	70
3.20	Cheerfulness and happiness	71
3.21	Melancholy and depression	71
3.22	A sense of emphasis	73
3.23	An illusion of depth	73
3.24	Shadow creates space	75
3.25	Light and form clarity	75
3.26	Light, shadow and depth	75
3.27	Texture's language	78
3.28	Yew park	78
3.29	Pattern and texture	80
3.30	Sense of thickness	80
3.31	Rugged textural pattern of an elephant's skin	80
3.32	Unity and textures harmony	82
3.33	Section of bark tree	82
3.34	Light and texture	82
3.35	Imitation of nature	84
3.36	Marble	84
3.37	Wood	84
3.38	Rhythm and light	88
3.39	Tactile rhythm	88
3.40	Colour and rhythm	90

3.41	Rhythm and contrast	90
3.42	The system of proportion in Greek architecture	92
3.43	The Proportions of the human body	92
3.44	The human being and the system of proportion	96
4.1	Line of access	102
4.2	Line of movement	103
4.3	The identity of lines	105
4.4	The dynamics of lines	106
4.5	Nature and creation	109
4.6	Aspect of Gestalt form	111
4.7	Seascape and horizontality	114
4.8	Berm houses	116
4.9	Reference in space	118
4.10	Frontality and obliqueness	120
4.11	The third dimension in geometry	122
4.12	The third dimension in architecture	123
4.13	The skyline and the perceptual field of forces	125
4.14	The perceptual field of forces in Portoghasi's drawing	127
4.15	Objects in space	129
4.16	Discrepancy and disconcert	134
4.17	As inside as outside	135
4.18	Visual weight and proportion	139
4.19	Material and visual logic	140
4.20	Life in landscape	142
4.21	Like a human heart, like a city heart	144
4.22	Symmetry and dissymmetry	147
4.23	Dissymmetrical plan	149

5.1	Dynamics of expression	153
5.2	Sydney Opera House	155
5.3	Bruno Taut, 'The rocks line, they speak.....'	156
5.4	Design for car factory	156
5.5	Expressional architecture	158
5.6	Expression and function	158
5.7	The spontaneous expression	160
5.8	Symbols of different objects	163
5.9	The Colosseum of Rome. The symbol of its public value.	163
5.10	The Power of Germany. Speir's Grand Domed Hall	165
5.11	TWA Terminal	167
5.12	The Pyramids of Giza, are a symbol of Egypt	169
5.13	The Church of St. Peter in Rome	169
5.14	Access to the Piazza del Campo in Sienna	171
5.15	Liverpool Anglican Cathedral	171
5.16	Lower Manhattan from Brooklyn	173
5.17	The German Pavilion, Paris World Fair	173
5.18	Habu Temple	175
5.19	The Acropolis of Athens	175
5.20	Architecture of Extroverted mood	176
5.21	The city of Naardan, Holland	177
5.22	The Forum of Trajan	177
5.23	Architecture of war	179
6.1	Regent's Park main elements	186
6.2	Regent's Park, London	188
6.3	The chosen location of Seventh Heaven 1	189
6.4	An Aerial perspective of Seventh Heaven 1	191

6.5	Planes of Seventh Heaven 1	192
6.6	First prize scheme in Seventh Heaven Competition	193
6.7	Third prize scheme in Seventh Heaven Competition	193
6.8	The Seventh Heaven and the shell	195
6.9	The tower and the shell	195
6.10	The form and the perceptual visual weight	199
6.11	The potential energy of the scheme's form	201
6.12	Nature and the aspect of self unity	202
6.13	The frontal elevation of the scheme	
6.14	The interaction of the internal spaces	205
6.15	The field of forces of the scheme's form	205
6.16	The skyline of the scheme	207
6.17	Perspective of Seventh Heaven 2	213
6.18	The spatial structure of Rome by Sixtus V	214
6.19	The main elements in Regent's Park	215
6.20	An aerial perspective of Seventh Heaven 2	217
6.21	An exciting dialogue of horizontal and vertical directions	219
6.22	Tension of Polarity	219
6.23	A dialogue of light and shadow	219
6.24	The expected engendered field of forces of Seventh Heaven 2	220
6.25	The Golden section and the scheme	221
6.26	The city of Baghdad	222
6.27	A comparison between the concept of the Seventh Heaven and the concept of the city of Baghdad	222
6.28	Sense of completion	223

6.29	Qubbat as Sakhrah, Jerusalem	228
6.30	Barado's Palace courtyard, Algiers	230
6.31	Different view of Barado's palace	230
6.32	Ornamental details in Ibn Tulun Mosque	232
6.33	Examples of Mushrabiyyah, Cairo	234
6.34	Sense of Contradiction	239
6.35	The Citadel Square	241
7.1	The Hellenistic Agora in Corinth, Athens	247
7.2	Plan of the Roman Imperial Fora	247
7.3	The town of Mohenjo-Daro, 1600 BC, India	248
7.4	Maidan-I-Shah, Isfhan, Iran	249
7.5	View of Maidan-I-Shah towards the Masjed	249
7.6	Piazza della Signoria	251
7.7	Todi Square	252
7.8	Madrassa Salih Negm	254
7.9	Palazzo Pubblico from the Piazza del Campo, Siena, Italy	255
7.10	Cross section through the exhibition space at the bottom of Palazzo Pubblico	255
7.11	Site Plan of the Piazza del Campo	255
7.12	San Marco's Piazza	257
7.13	St. Peter's Square in Rome	258
7.14	Piazza del Popolo, Rome	259
7.15	Versailles	261
7.16	Place Vendome, Paris	262
7.17	Place de la Liberation	262
7.18	Place de la Concord, Paris	263
7.19	Place de L'Etoile, Paris	265
7.20	The Square of Cleveland, Ohio, 1859, U.S.A.	267

7.21	Piazza in the city center of Lanciano	269
7.22	AMP Square	270
7.23	The Piazza of Dallas City Hall	271
7.24	Plan of ANZAC Square	272
7.25	ANZAC Square as seen from the G.P.O.	272
7.26	Squares and the sense of drama	272
7.27	ANZAC Square as a place for Commemoration in Brisbane	273
7.28	Plan of Central Hamburg as it was in 1892	274
7.29	General View of the city center of Hamburg, 1921	274
7.30	Town Hall Square and the use of San Marco's Concept, 1921	275
7.31	Victoria Square, 1873, Montreal, Canada	275
7.32	Ghent Square, Virginia, U.S.A.	276
7.33	Portland Plaza, first prize	277
7.34	Portland Plaza, second prize	277
7.35	Portland Plaza, third prize	278
7.36	Portland Plaza, fourth prize	278
7.37	Portland Plaza, fifth prize	279
7.38	Portland Plaza, sixth prize	279
7.39	Mehring Platz, Berlin	280
7.40	The Lutzow Platz, Berlin	280
7.41	Prager Platz, Berlin	281
7.42	Prager Square as it was until 1981	281
7.43	Plan of Luisenstadt in Berlin	281
7.44	Prager Square proposal	282
7.45	Venturi's Piazza, 1977, Washington	283
7.46	Trafalgar Square and the sense of drama	284
7.47	The Royal Scottish Academy and the National Gallery of Scotland	285
7.48	Placa Reial, Barcelona	286

7.49	Placa de las Navas, Barcelona	287
7.50	The New Housing and The Municipal Center of Drancy, France, 1980.	288
7.51	Place de la Palmera	289
7.52	General View of Place de la Palmera	290
7.53	Looking from the tree area towards the back of the curved wall	290
7.54	General View of Tetuan Square	291
7.55	Plan of Tetuan Square	291
7.56	Detail of gates and lamp in Tetuan Square	291
7.57	Site Plan of Alella Square	292
7.58	The boundary between a private garden and the square	292
7.59	Plan of Alella Square Barcelona	292
7.60	Square and Market, Alella	293
7.61	Perspective Alella Square as it can be seen from a private garden	293
7.62	San Francisco's Union Square	294
7.63	New York's Rockefeller Center	294
7.64	Rockefeller Center Plaza	295
7.65	Trafalgar Square, London	296
7.66	Ammon Temple at Karnak, Egypt	298
7.67	The town of Kahun, Egypt	298
7.68	The development of Cairo during Ismail reign, 1869-1870	304
7.69	The mosque of Ibn Tulun, Cairo, with its central square	305
7.70	Ibn Qalawun Mosque and its square	305
7.71	Al-Atabah al Khadra Square	306
7.72	Abdin Palace and its square	306
7.73	Cairo Central Station Square, Bab Al-Hadid	306
7.74	Mohamed Ali Square	307

7.75	The square of Cairo Opera House	307
7.76	The Liberation Square 'Maydan Al-Tahrir', Cairo	307
7.77	Crowd in Al Husayn Square after Friday praying service	308
7.78	Al Husayn Mosque and its square	308
7.79	The Mosque of Al Hakim and its square	309
7.80	The Mosque of Al Hakim with its internal court (Sahn)	309
7.81	Heliopolis Cathedral with its dominated open space	310
7.82	Al Gizeh Square	311
8.1	Positive space and negative space	315
8.2	Grouping and the potentiality of space	315
8.3	The basic formal elements of space.	316
8.4	Casualty and space	316
8.5	The space and the surrounding physical conditions.	316
8.6	The introduction between form and space	318
8.7	A sense of spatial possitivity	318
8.8	Plan of Musahino Art University	319
8.9	Sense of hierarchy between different exterior spaces	321
8.10	Axis without terminous	322
8.11	Asakusa temple in Tokyo	322
8.12	The tombs of the Ming Emperors	323
8.13	The relationship between the height of the buildings and the appropriate intervals between them	323
8.14	Sense of spatial tension between opposing buildings	323

8.15	The main elements of enclosure	324
8.16	Place in Durham	325
8.17	Contrast of spaces	325
8.18	Change of levels and the sense of surprise	326
8.19	Alley in Dartmouth	326
8.20	A small neighbourhood plaza in Sacramento, California	328
8.21	The bustling place Du Tertre, Paris	329
8.22	A small plaza and arcade in Porto Fino, Italy	329
8.23	The Place de La Concord; a symbol of Paris	331
8.24	The Piazza del Campo in Siena	331
8.25	The small Mechanics Plaza in San Francisco	333
8.26	Prague Main Square	341
8.27	The Place de L'Etoile	341
8.28	Group of Houses in Cheyne Walk, London	343
8.29	A photograph in St. Martin's, Stamford	343
8.30	The relationship between the old and the new buildings	345
8.31	The structure of the city in abstract form	348
8.32	The main elements in the structure of the city	349
8.33	Lenin Square in Erevan	350
8.34	The square and the city	351
8.35	The central part of Washington	352
8.36	Plan of London by Hooke	353
8.37	A comparison between Washington, Versailles and Paris	354
8.38	The development of Savannah	355
8.39	Project for the center of Leinfelden, West Germany	355

8.40	The wall and the identity of the square	358
8.41	Brick makes different pattern of floors	359
8.42	The floor of the Capitoline's Hill by Michelangelo	360
9.1	Parliament Square	366
9.2	Parliament Square site plan	368
9.3	Plan of the existing square	370
9.4	Perspective of the Researcher's Scheme	372
9.5	Abstract plan of the researcher's proposal	374
9.6	North elevation of the researcher's concept	376
9.7	Analytical studies of the researcher's entry	378
9.8	First award scheme in Parliament Square competition	379
11.1	Overall view of Liberation Square in the 60's.	399
11.2	Qasr Al-Nil Barracks in the 1940's (British troops headquarters).	401
11.3	The Hotel of Hilton Al-Nil	401
11.4	Liberation Square and the important buildings around its edges	403
11.5	The medieval city of Cairo and the new added part by Ismail in 1867	405
11.6	Cairo in the mid-nineteenth century	405
11.7	Liberation Square in 1956	406
11.8	The Egyptian Museum on the North side of the square	407
11.9	The group of the residential buildings on the east side of the square	407
11.10	The Egyptian Ministry of Foreign Affairs	407
11.11	Hilton Al-Nil Hotel building and the bus terminal in the front of it	
11.12	The Arab League building	408

11.13.	The Government Central Building and Omer Macram Mosque	408
11.14	Liberation Square as it looks today during the construction of the underground central station	410
11.15	An established sense of chaos in Liberation Square	411
11.16	Downtown Cairo and the main roads in the city	414
11.17	Liberation Square before the demolition of its landscape in the end of 1982	415
11.18	The traffic's and the bus terminal's occupied area inside the square	417
11.19	The anticipated impact of the underground on peak hour bus trips, which terminate in Liberation Square	419
11.20	The expected impact of the underground on the bus trips, which end at Liberation Square	419
11.21	Cairo's traffic problems over the Egyptian Newspapers	420
11.22	Al-Tahrir Underground Station and its entrances and exits system	421
11.23	View of the square looking towards the north	424
11.24	Sense of human violation	424
11.25	Liberation Square in the 60's	427
11.26	Liberation Square, a place mastered by traffic	431
11.27	Sub-conscious study for the potentiality of the square's shape	432
11.28	The boundaries of the square	433
11.29	The potentiality of the traffic inside the square	434
11.30	The potentiality of the crowds inside the square	435
11.31	Sense of containment	436
11.32	General sense of disruption	437

11.33	The height of the buildings around the square	438
11.34	The skyline of the buildings around the square edges	439
11.35	Geometrical study for the square form	440
11.36	The Government Central Building	443
11.37	Sense of dominance, rigidity, formality and balance	443
11.38	The residential group of buildings around the square	445
11.39	Comparison between the Government Central Building and the residential group of buildings	445
11.40	The Government Central Building and Omer Macram Mosque	447
11.41	A comparison between the Government Central Building and Omer Macram Mosque	447
11.42	Hilton Al-Nil Building Hotel	449
11.43	A comparison between the building of Hilton Al-Nil and the Government Central Building	449
11.44	Cleopatra Hotel Building	451
11.45	Comparison between the building of Hilton Al-Nil and the building of Cleopatra Hotel	451
11.46	The Arab League building	452
11.47	Sense of emptyness and hollowness	452
11.48	The pedestrian's bridge in Liberation Square	454
11.49	The pedestrian's bridge at Al-Falaki Square	455
11.50	Nature in Landscape	457
11.51	The square's previously demolished landscape	460
11.52	Liberation Square and the Arab League Building	465
11.53	Al Husayn's Square	467
11.54	The Egyptian Museum	470

11.55	The Ministry of Foreign Affairs building	470
11.56	The Egyptian Museum and the Tower of Hilton Ramses	472
11.57	The Foreign Affairs Building within a sense of confusion	472
11.58	Plan of the medieval city of Cairo before Ismail's addition in 1867	474
11.59	The important squares appeared in the modern city of Cairo, 1887	476
11.60	Plan of the central part of the contemporary city of Cairo with both of its old and new parts	478
11.61	The structure of Paris after Husssmann's addition	482
11.62	The Madeleine and its leading bridge over the River Seine	482
11.63	Liberation Square as it can be seen from the direction of Al Tahrir Bridge	484
11.64	Al-Falaki Square and how it looks today after the construction of the elevated crossing system	485
11.65	Collision at Al-Falaki Square	485
11.66	The skyline of London in the 19th Century	488
11.67	The skyline of Venice	488
11.68	The city of Philadelphia	489
11.69	The skyline of old Cairo	491
11.70	Different views of the skyline of modern Cairo	491
11.71	The skyline of modern Cairo	492
12.1	The proposed location for the bus terminals	506
12.2	Liberation Square as a public urban Piazza	509
12.3	Site plan of the proposed concept	513
12.4	Plan of the proposed idea shows the relationship between the two collonades and the system of exits and entrances	514

12.5	Longitudinal section through the proposed concept	515
12.6	Site plan of the proposed concept	516
12.7	Overall view of the concept passes Ramses Street	517
12.8	View from the east towards the River Nile	518
12.9	View from the east showing the concept of its relationship with the area of downtown Cairo	519
A.1	Analytical studies of the main crosses of Ramses Street	541
A.2	Ramses Square	542
A.3	Orabie Cross	542
A.4	Al Essaaf and 26 July Cross	543
A.5	Abd Al-Moniem Reyaad Cross	543
A.6	Analytical studies of Ramses Street and its main buildings	544
A.7	Ramses tower	545
A.8	Al-Fath Mosque	545
A.9	Red Cross Hospital	546
A.10	The Corporation of Engineers	546
A.11	The Organisation of Communication	547
A.12	The Organisation of Properties Registration	547
A.13	The Corporation of Lawyers	548
A.14	The Egyptian Museum	548
A.15	Liberation Square and its main axes	553
A.16	View from Qasr Al-Nil Street towards Liberation Square	555
A.17	The Egyptian Museum and Hilton Ramses Hotel	555

A.18	View from Al-Qasr Al-Aini Street towards the Square	556
A.19	View from Ramses Street towards the Square	556
A.20	The Pedestrians in Liberation Square	558
A.21	The pedestrians bridge in Liberation Square	560
A.22	View of Ramses Street taken from Reyaad C Cross	562
A.23	View of Ramses Street looking towards the Organisation of Communication and 26 July Cross	562
A.24	The formal organisation of Ramses Street	563
A.25	The formal organisation of Qasr Al-Nil Street	564
A.26	The formal organisation of El Qasr Al-Aini Street	565
B.1	Site plan of Seventh Heaven (Scheme 1)	567
B.2	The ground floor; the elevations; the site plan and perspective	568
B.3	The mezzanine floor; the basement and the sections	569
B.4	The ground floor	570
B.5	The mezzanine floor	571
C.1	The site plan; the mass plan and the perspectives of Seventh Heaven 2	573
C.2	Site plan of Regent's Park and the proposed concept	574
C.3	General perspective of the proposed scheme and the Seven Columns	575
C.4	Mass plan of the proposed concept	576
C.5	The ground and the first floor	577
C.6	Sections and elevations	578
C.7	The ground floor and the basement	579
C.8	The first floor	580
C.9	Section B-B	581

C.10	The front elevation	582
D.1	The site plan; perspective; pedestrian's movement and location analysis of Parliament Square Scheme	584
D.2	General perspective of the proposed concept	585
D.3	The south elevation and section A-A of the researcher's entry	587

A.1	The result of question No. 2 from the questionnaire	533
A.2	The result of question No. 3 from the questionnaire	534
A.3	The result of question No. 4 from the questionnaire	534
A.4	The result of question No. 5 from the questionnaire	536
A.5	The result of question No. 6 from the questionnaire	536
A.6	The result of question No. 7 from the questionnaire	536
A.7	The result of question No. 8 from the questionnaire	536
A.8	The result of question No. 9 from the questionnaire	537
A.9	The result of question No. 10 from the questionnaire	537
A.10	The result of question No. 11 from the questionnaire	537
A.11	The result of question No. 12 from the questionnaire	537
A.12	The result of question No. 13 from the questionnaire	537
A.13	The result of question No. 14 from the questionnaire	538
A.14	The result of question No. 15 from the questionnaire	538
A.15	The result of question No. 16 from the questionnaire	538
A.16	The result of question No. 17 from the questionnaire	541
A.17	The result of question No. 18 from the questionnaire	549

FOR MY WIFE

ACKNOWLEDGEMENTS

The researcher is indebted to:

Ain Shams University Library staff in Egypt
Alexandria University Library staff in Egypt
Cairo Surveying Organisation
Cairo Underground Metro Organisation staff
Cairo University Library staff
Glasgow University Library staff
Mackintosh School of Architecture Library staff in Glasgow
Strathclyde Library staff in Glasgow

The researcher is also indebted to the following people:

Catherine Harrison
Richard McLaren
Lyn McLughlin
Neil McVicar
Stewar Neil
Judy Pickering

Finally, the researcher's special thanks to Professor Andy MacMillan, the head of the Mackintosh School of Architecture and the supervisor of this thesis, for his advice and guidance towards the completion of this work, and Professor William Lever, the Mackintosh School of Architecture and in Glasgow University for checking this thesis technically and linguistically. Also Dr. James Macaulay in the Mackintosh School of Architecture and Glasgow University for checking parts of this thesis linguistically and for his advice.

INTRODUCTION

Perception may be regarded as the most complicated process to occur within the human brain. In its basic form, perception implies the use of memory in order to make sense of life's phenomena. The field of perception is extremely complicated. Its data derived from both psychological experiments and also from research in the field of philosophy. Perception is also a very broad subject, for it deals with all aspects of mankind's life and its problems.

Perception in Architecture and the Environment, which is the main concern of this thesis, can be counted as one part of the whole subject of perception.

In a comment on meaning, Langer says that architecture has been counted as a plastic art where it uses the elements of space, form, colour, material, etc., which architects are required to understand in their abstract connotations and in their varied moods¹. Lynch on the other hand states that; structuring and identifying the environment is a fundamental ability in which a lot of varied cues are used such as colour, shape, light, motion, sound and smell². Designers of the city must therefore be attuned to their language and the potential of their varied expressional accents.

The importance of the field of perception as a basis for the process of design in both architecture and urban structure has been acknowledged. However, currently there is a great lack of application and utilisation of knowledge of that field³. Low standards of urban design as Smith says, are in part the direct

result of a gross under-estimation of the complexities of human perception and the mental requirements⁴. Hence, one can say that dissatisfaction with undesirable results in the design of our environment and with its design courses, were the main motive behind the researcher's venture into the field of perception and its application to both architecture and urban design.

Within the general structure of the research are four case studies chosen as practical applications in these two subject areas, from the point of view of the field of perception. These cases respectively are: The Seventh Heaven Competition, Seventh Heaven 2, The Parliament Square Competition, and finally, the redesign of the Liberation Square in Cairo (Egypt).

Apart from their consideration as practice designs in both architecture and urban design, these case studies were regarded as useful opportunities for the researcher to apply and demonstrate his understanding of the area of perception and its constraints, which govern the human mind's conceptual ability in structuring the environment.

The redesign of Liberation Square (Maydan Al-Tahrir), in particular is treated as the principal case study through which the researcher attempts both to evaluate the role of the square as a symbolic urban space in Cairo and to redesign it within the methodology derived from his researches.

According to the methods chosen in this research, such a treatment aims at the construction of new design guidelines for constructing squares deriving from the principles and the limits of perception.

In connection with the methodology used in this research, it

is worthy of note that the researcher uses the 'questionnaire' as a means of eliciting subjective responses, side by side with a theoretical analysis which mainly has a bias towards psychological and perceptual interpretation.

In detail, the structure of this thesis contains eight parts and four appendices. The first part has two chapters, comprising a theoretical introduction to the operation of perception within the human mind. The second part comprises three chapters which contain a literature survey of architectural elements within the context of perception. The third part has only one chapter comprising two case studies of a project in Regent's Park in London, 1983, which can be counted as an application of the theoretical aspects of Part 1. The fourth part has two chapters; these comprise a discussion of the theoretical background to that entity, the square in the city. The fifth part is a single chapter which can be regarded as an application of the later theoretical arguments. It comprises a third case study for a project based on a competition for redesigning Parliament Square in London, 1984. The sixth part also contains only one chapter which mainly describes the methodology used in analysing the final case study, that of 'Liberation Square in Cairo'. The seventh part contains also one chapter, which comprises the analysis of 'Liberation Square' in Cairo on two levels: i) the square as an individual locus, the styles of its buildings, its function, symbolism and validity as a public urban space; and ii) the square in terms of its relationship to the city as a component of its organism. The eighth and final part of this research contains the conclusion and recommendations. There

follow four Appendices identified as follows: The first appendix presents a copy of the questionnaire used in the research. The second appendix contains some photographs of Seventh Heaven 1 scheme; the third, some photographs of Seventh Heaven 2 scheme. The fourth and final appendix contains some photographs of the Parliament Square competition scheme.

NOTES AND REFERENCES

- 1 See Langer, Susanne K., Feeling & Form (Routledge & Kegan Paul Limited, 1953), pp.366-9 and Arnheim, Rudolf, Art & Visual Perception, A Psychology of the Creative Eye (University of California Press, 1974), pp.3-8.
- 2 Lynch, Kevin, The Image of the City, (The M.I.T. Press, Massachusetts Institute of Technology, Cambridge, Massachusetts, and London, 1982, p.3.
- 3 See Goodey, B., Perception of the Environment (Research Publications Services Ltd., 1971), p.1 and Arnheim, R. Art and Visual Perception, (University of California Press, London, 1974), p.3 and Arnheim, & The Dynamics of Architectural Form (University of California Press, London, 1977,) p.1.
- 4 See Smith, Peter F. The Dynamics of Urbanism (Hutchison, 1974), p.11 and Arnheim, ibid., 1977, p.11.

PART 1

PRINCIPLES OF PERCEPTION

INTRODUCTION:

The process of perception is considered to be one of the highest achievements of the human mind. Man without perceiving his environment would not be able to understand it.

Our environment is a mixture of ever changing phenomena and "perception is the use of memory to make sense of (these) phenomena and, if necessary, calculate the requisite innate responses needed to negotiate the objects in space. Our behaviour in the environment is the result of the interaction between the viewed phenomena and those responses which are given by the human mind. "The word 'phenomena' designates every 'something' which may be experienced, and its counter, 'nothing' does not designate anything, but expresses the concept that I do not experience anything, that is, that nothing is present to me."²

For analysing the visual perception of our environment, we need a mass of data.

Psychologists have contributed a mass of data on these elements (human relationships of time, his intuitions and his emotions) in behaviour, but when it comes to man's perception of space and environment, there is much less empirical research to report, and our understanding is far from complete. ³

Perception is a broad field which covers all aspects of the human life. Environmental perception which is a part of these aspects, "is a process whereby sensory information from the 'real' world is structured by the mind to

facilitate absorption by the individual".⁴

Structuring and identifying the environment is a great ability in which many kinds of cues are used such as: colour, shape, light, motion, sound and smell.

In the process of perception the human being's mind receives messages from the body's five senses. Later, these messages are interpreted emotionally to different responses. In perceiving our environment we mostly use our sense of vision in which we use our eyes to pick up information from the real world to be sent to our mind.

Briefly, the process of perception can be described as being an operation in which the EYE and the BRAIN are used. The reader therefore will find that part looks like a trip in which the information moves through the human vision system and it arrives later in his mind, which can be described as a producer of our responses on which our behaviour is dependent.

1.1 THE EYE

1.1.a LIGHT AS A STIMULUS FOR VISION

Man needs light to see. It stimulates the receptor cells in the eye to form the image. "...light that stimulates the receptor cells in the eye must traverse the optic media, including the cornea, aqueous humor, lens, vitreous humor, and most of the retina."⁵

In the process of vision our eyes perceive two dimensional images on the screen of the retina. However, the world which we perceive is three-dimensional. In this context, Wilson (The Mind, 1968) adds that:

...since each of our eyes regards an object from a slightly different point of view, we receive two slightly different versions of the same scene. Normal vision is the fusing of these two images into a simple picture with a three-dimensional look.

This phenomena is the principle behind the stereoscope, a visual device using a prism or mirror to endow flat pictures with an artificial third dimension. 6

1.1.b SEEING

The eye is often described as a camera. It transfers the optical images that fall on the retina into electrical currents which are driven later to the mind through the optical nerve.⁷ On that meaning Gregory (Eye and Brain, 1974) also comments that,

The eye's (function)...is to feed the brain with information coded into neural activity - chains of

electrical impulses - which by their code and the patterns of brain activity, represent objects... when we look at something, the pattern of neural activity represents the object and to brain is the object. No internal picture is involved. 8

Gregory, contrary to what Gestalt writers say, states that there are no pictures within man's brain.

The process of seeing does not depend solely on that information meeting the eye. On the contrary it uses that information, stored within our minds, which has been collected from previous experiences. That reveals to us how cartoonists can show things by offering little clues, leaving the rest to the mind to complete.⁹

The human being's eyes as Gregory describes them are typical vertebrate eyes, and are not among the most complex highly developed eyes, but the human's mind is the most elaborate of all brains. The eye system is a unique structure, being isolated from the blood stream. Parts of that system depend on the aqueous humour as a source of nutriment like the cornea and the lens. The main organs of the eye's system are: The eye ball; the crystalline lens; the cornea; the iris and the pupil. The eye ball is equipped with six extrinsic muscles, which hold it in position in its orbit, and rotate it to follow moving objects or direct the gaze to chosen objects. The crystalline lens functions as a visual accommodation organ which by the changing of its position and its shape, our visual scope can be focussed. The cornea's function is to bend the incoming rays of light to form the image. The iris which is a pigmented and opaque membrane works as an effective aperture stop for the lens. By

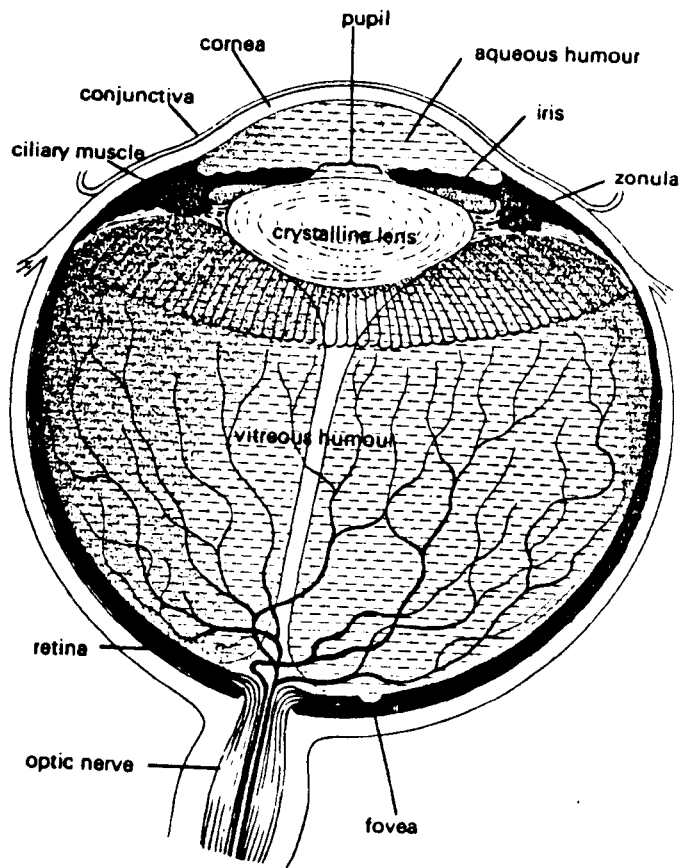


fig. (1.1)

The human eye. The most incredible optical instrument. Here lies its important parts: the cornea, the crystalline lens, the retina and the optic nerve.

(Source: Gregory, 1979, p.50.)

narrowing or widening that aperture, the iris controls the amount of light entering the eye; consequently the retina gets less light. The pupil is not a structure on its own, but is the hole formed by the iris through which light passes to the lens and on to the retina as an image. The retina is a thin sheet of interconnected nerve cells, including the light-sensitive rod and cone cells which convert light into electrical pulses - the language of the nervous system.¹⁰

One of the most incredible things about eyes is their ability to engender a depth of perception. This happens when eyes pivot inwards for viewing near objects, or when they pivot outward for viewing remote objects: distance here is signalled to the brain by this angle of convergence. Depth of perception can also happen through the disparity of the two viewed images. The eyes are horizontally separated (by about 6.3 cm) and so receive somewhat different views. The slight difference between the perceived images is known as 'disparity'. It gives perception of depth by stereoscopic vision.¹¹

A remarkable fact about eyes is also their ability to provide us with a feeling of safety. We feel giddy if there is a railing to protect us from falling, but if the same railing is covered with cardboard or paper, and gives support to the eye, giddiness often disappears through the illusion of safety. Gropius again confirms this when he says that people get lost in a space which lacks visual definition.¹²

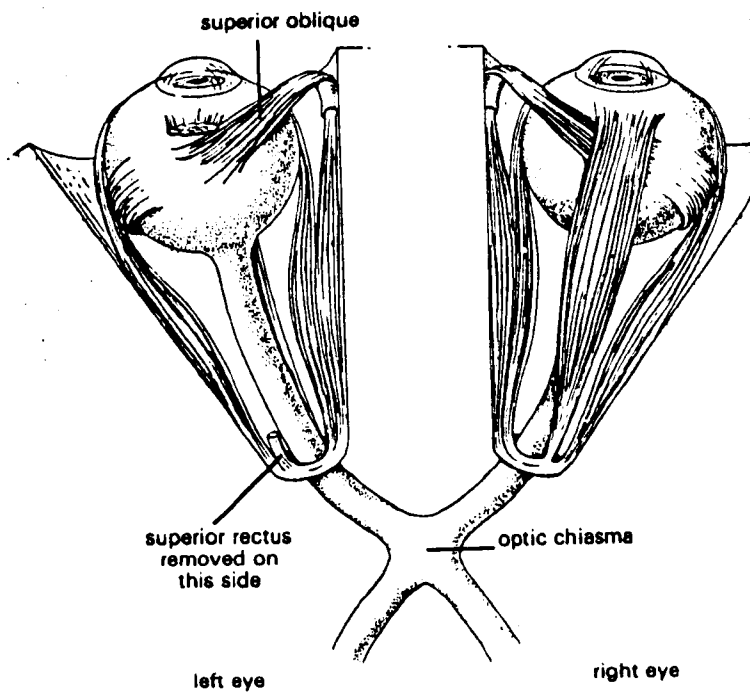


fig. (1.2)

The muscles of the eye. The six muscles of the eye are responsible for keeping the eyeball in the intended orbit.

(Source: Gregory, 1979, p.50.)

1.2 THE BRAIN

The human brain is considered to be the most complicated of the body's organs. It is also the most elaborate brain ever to have evolved. The brain is the human's control mechanism which directs behaviour in daily life.

In the last few pages I have mentioned the relationship between eye and brain, and their roles in the process of perception. Now I will explain in more detail the brain's anatomy and its role within the human body.

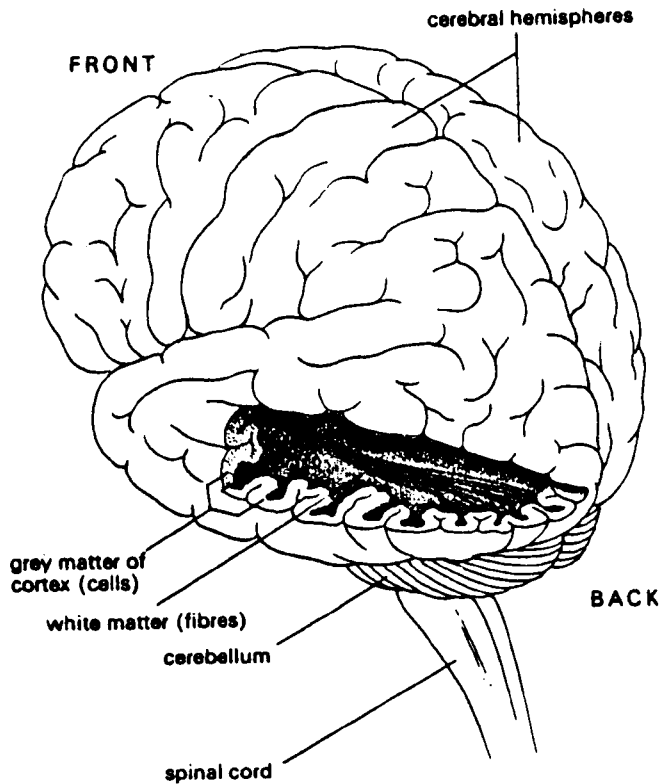
The brain was described as being a lump of matter from inside, and as a pink-grey object, nearly the size of two clenched fists from outside. Its main parts can be seen in figure (1.3). These main parts are made up of so called 'white' and 'grey' matter, the white matter being the fibre connecting the cell bodies which form the grey matter.

The brain is largely concerned with motor - control of the limbs, and with the sense organs.

The outer surface of the brain is called the cortex and is curiously convoluted. Each of our five senses has its own region of that cortex.

The brain consists of 10,000 million nerve cells which, in a mass of white and grey matter knot inside the skull. The nerve cells in the brain consist of cell bodies, each having a long thin process - or axon - conducting impulses from the cell.¹⁴ The axons may be very

fig. (1.3)



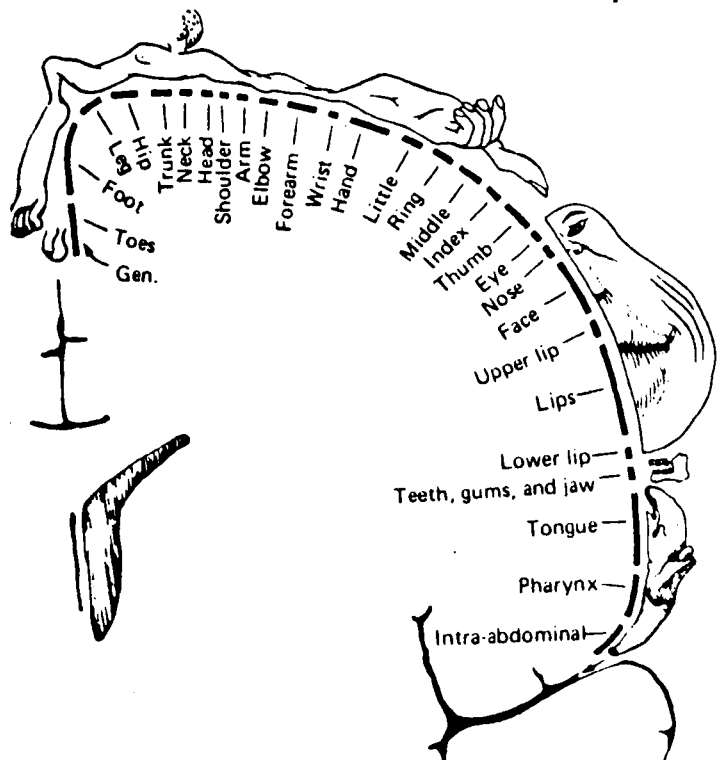
The brain, in which we can see the visual part - the area striata - at the back.

(Source: Gregory, 1979, p.38.)

fig. (1.4)

The human receptors. A graphic representation showing the link between the brain and the different receptors of the human body.

(Source: Gregory, 1979, p.39.)



long, sometimes extending from the brain down the spinal cord. The cell bodies also have many finer and shorter fibres, which are called 'dendrites'. The mind, as Wilson says, "can handle complex situations through the use of abstraction and combination, and reach logical conclusions which may result in decisive action or creative ideas".¹⁵

The process of perception which is our concern is that part which happens when the brain stem and the contiguous areas are stimulated by an electrical charge, through which we can elicit the reactions of defence, flight and hunger; through stimulation of higher levels, a compulsion to laugh; through stimulation of the cortex, visual and auditory reactions, among others.¹⁶

Man's nervous system is incredible. Networks of nerve cells, some with fibres many feet long, run throughout the human body, joining all the tissues. Electrical impulses traverse these pathways at unbelievable speeds which range from 2 to 200 miles an hour, relaying intelligence to and from the brain.¹⁷

The computer device concept was derived from the human brain. Similarly, the brain accepts information, and makes decisions according to the data stored in the memory.¹⁸

It was mentioned earlier when discussing the eye that the neural system responsible for vision starts with the retina and it ends at the visual region of the brain. This region which lies at the back of the brain is known

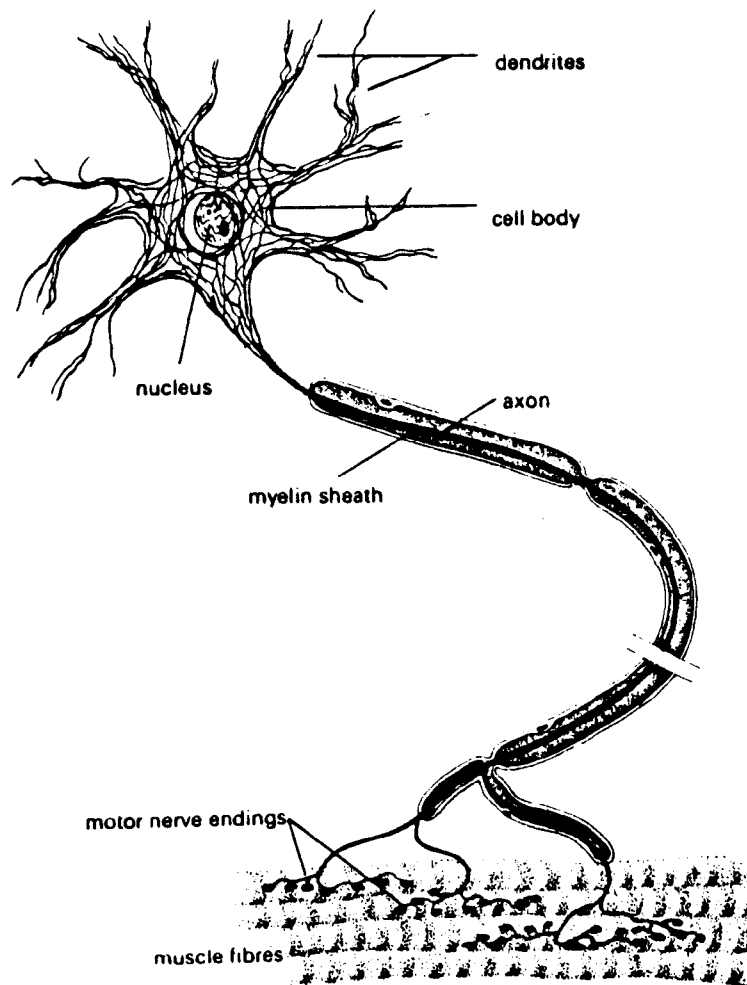


fig. (1.5)

A nerve cell. The cell body has a long axon, by which control signals are sent to muscle.

(Source: Gregory, 1979, p.40)

as the area of striata.

The brain, as Gregory (1979) describes it, is divided down the middle, forming two hemispheres. The two parts are joined together by a massive bundle of fibres, The Corpus Callosum and the smaller optic chiasma. The central region of the area striata is known as the visual projection area. "When a small part is stimulated a patient reports a flash of light upon a slight change of position of the stimulating electrode, a flash is seen in another part of the visual field. It thus seems there is a spatial representation of the retinas upon the visual cortex."¹⁹

The electrical impulses which stimulate the neural cells of brain are translated in such coded mental pictures. These pictures are not really electrical pictures, but they are coded symbols which do not need to be similar to the things which they represent.²⁰



fig. (1.6) Varied sections in the brain.
(Source: Wilson 1968, p.32)

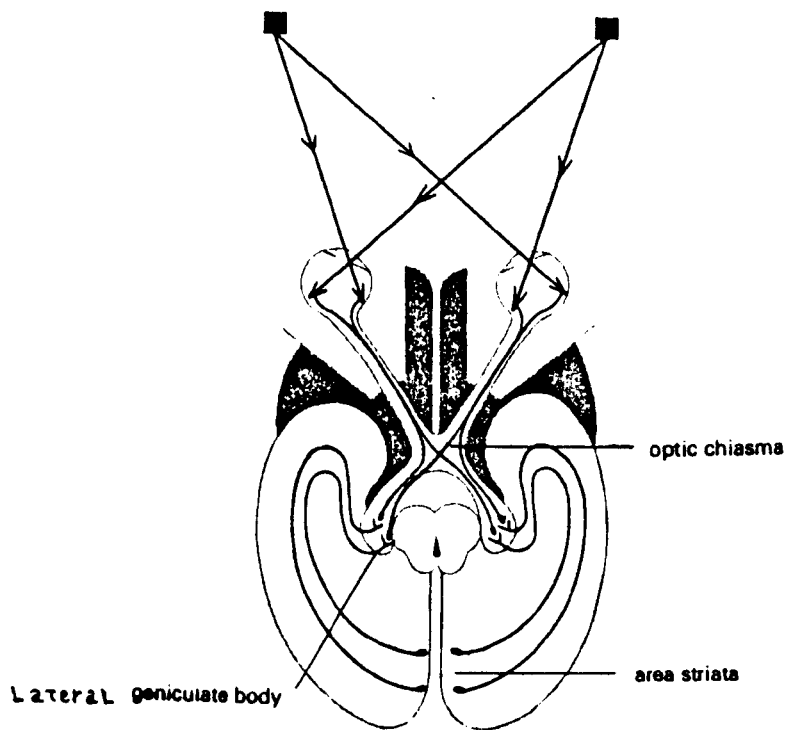


fig.(1.7)

The optic pathways of the brain. The optic nerve splits at the chiasma, accordingly the right half of the retina is responded at the right side of the accepted cortex, the left side of the left half.

(Source: Gregory, 1979, p.45.)

1.3 MECHANISM OF PERCEPTION

1.3.a PERCEPTION AS A COMPLETE PHYSIOLOGICAL PROCESS

As mentioned before, the process of perception is the highest achievement of the human mind. Hence it is important for us to try to understand how this process occurs from the moment that we see the things up to the moment that we respond to them.

Over-looking the way humans used to perceive their environment in the past has resulted in such a mess in designing that environment. As in Smith, (1974, p.11)

...Low standards of urban design are in part the consequences of a gross under-estimation of the complexities of human perception and the mental need. It may contribute to higher standards of design if the mode of response of the mind to built environment is understood in terms of values, symbolism and aesthetics. 21

Arnheim, as an artist, had the same belief as Smith that our buildings and consequently our environment show the deficiency of understanding man's needs and his perceptual reactions. That was the reason for Arnheim's setting out to look at art and architecture as a part of that art through the field of psychology, being considered as the matrix of studying the perception of the human being.

The process of perception in its mechanical sense can be understood from what Hesselgren says is a kind of physical energy reaching one of our sense organs, by

which a sort of electro-chemical impulse is sent to the brain by one of our nerves. This impulse gives rise to the experience of something which is called either a sensation or perception.



fig. (1.8). Body & Perception.
In this illustration the heat signal of the fire is transmitted to the brain throughout the long fiber which runs from the foot to the cranial cavity.

(Source: Wilson, 1968, p.33)

1.3.b THE FUNCTIONS OF THE CENTRAL NERVOUS SYSTEM

As in Smith,(1974, p.15), the central nervous system has three functions, on which the process of perception is based. These functions are:

Motivation

Memory

Learning

(i) Motivation

Motivation is the natural innate power on which our primary behaviour depends in our early life. The process of perception depends on our motives. As Smith says "we need to see" and it is not accurate to say that "we see what we need".

It is an acknowledged characteristic of the brain that it has two opposed tendencies: one promoting analysis and order, the other seeking novelty - surprise - and patterns of complicated relations.

Although order and simplicity are of a great importance in the process of perception, novelty and surprise, however, are essential to mental health and growth.

(ii) The Memory System

Perception is based on memory. If our previous experiences are not kept in our mind, then we will not be able to understand or to perceive what is going on

around us. Memory in de Bono's definition is "what is left behind when something happens and does not completely unhappen".²²

As in Anand (1978, p 52) memory is an instrument which leads the onlooker from recalled feelings and images towards the imagination of other similar forms and sensations. Coolness is recalled through light colours such as blue or white, heat through warm colours like red or orange, strength through harsh and tipped shapes, smoothness through rounded forms, subtle rhythms and sound through alliance with linear brushwork.

Memory as Smith states, has three kinds of storage: short-term; medium and long-term or permanent. In the process of perception short-term memory is vital, the reason being that the brain can only concentrate on a small attention fragment at one time for a short period.

Because our brain perceives information in consecutive ways, short-term memory enables these fragmentary pieces of information to be interlocked together.

Two subsequent perception fragments may be as shown below:

fig. (1.9)

Fragments of an
information unite

(Source: Smith,
1974, p.22)



AND



Short-term memory allows the relationship to be constructed as follows:



Unified pattern of information

Long-term memory is established by connection between cells to form patterns. It can be described as a permanent trace on the brain which consists of the physical interlocking of perception fragments to form a coherent memory pattern.

Short-term memory lasts one or two days compared to the long-term one which lasts for years.

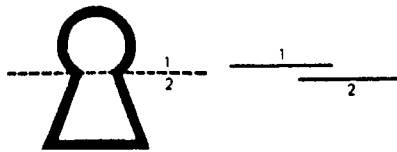
The process of establishing a trace in the memory as Smith explains, was described by Semon as early as 1921 as "engramming". A pattern of engrams recording a unit of information has been called a "meta-circuit". A number of linked cells may be represented graphically by an engram line.

A unit of memory as Smith indicates, comprises a pattern of cells and nerve pathways which unite into an encoded version of the events of the memory. However, these cells are available to be used in the event of perceiving other information. Hence, memory patterns are interlocked in such a wondrously complex way.

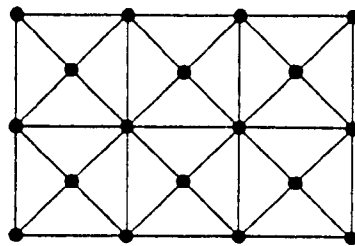
fig. (1.10) principles of engram notation.



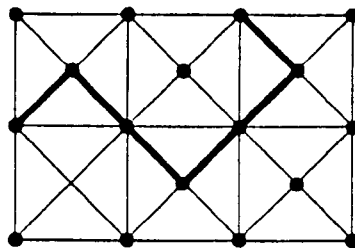
By using the engram notation a Keyhole meta-circuit could be represented as shown here.



(Source: Smith, 1974, p.23)



Existing network of cells and pathways



Memory impress raises probability to a specific pattern of cells and pathways

fig. (1.11)

Cell pattern theory.

(Source: Smith, 1974, p.23)

It is remarkable that in the long memory a permanent impress involves adding extra emphasis to a pattern of cells and pathways, so that it stands out as a figure against ground.

As Smith says, there are two schools of thought as to how our memory is built. One theory is that, in a sense, all information pre-exists in our brain, and perception and thought are a matter of internal exploration. The other theory suggests that long-term memory involves the formation of new linkages.

(iii) Learning

According to Smith, the basic patterns on which our memory is established are built in the early years of mental development, as the primary model of the world is constructed. These patterns are a physical, internal representation of the external world. Each basic category of these patterns is called a schema.

Past experience makes the mind able to construct probabilities about the visual and viewed array. A specific place in the city is recognised because the memory has constructed a pattern of cell connections and linking pathways which in their abstract meaning are an encoded version of the visual events of that pattern.

1.3.c THE SUBLIMINAL PERCEPTION

The memory storage fortunately is built up irrespective of conscious awareness. As Smith says, studies

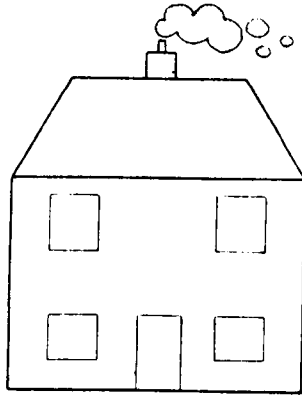


fig. (1.12)

Basic image of a house

(Source: Smith, 1974, p.27)

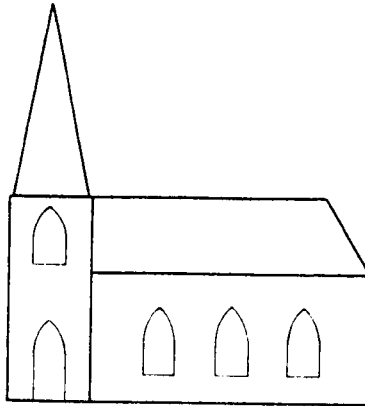


fig. (1.13)

Basic image of a church

(Source: Smith, 1974, p.27)

in subliminal perception lead to the conclusion that information can be perceived, classified and even responded to, without reference to conscious attention. The term "subliminal perception is used to mean perception under the level of consciousness.

The classifier is an important part of the recording system. It enables urban visual information to be perceived and classified according to its correspondence with the experiential schema. Schemas interlace with each other at many points. A mosque is part of the general urban schema. At the same time it is part of the religion schema. Schemas are divided into numerous sub-schemas, each one of them looks like a tree in the way it branches out.

Bartlett, as in Smith (1974) defines the concept of schema as being an active organisation of the past experiences.

According to the subliminal perception basis recognising the visual arrays does not experience problems if it has a sense of variation. Life would be impossible if the brain had consciously to formulate a detailed muscular programme in which its components are the same.

One astonishing aspect of our mind is its ability to maximise our perception of the visual arrays in a straight forward direction. A hint of a regularly perceived event should lead to a comprehensive perception.

Under the rule of system maximisation, perception as Smith refers to, tends to be reduced to the most simple form.

Georgian house.
Sub-schema.

Addition of three
objects: 1 and 2
are common to the
basic sub-schema.
The third is new.

System of maxi-
misation does not
allow diverted
objects to be
established according
to its position in
the visual array.
Conversely, its
registration comes
later unless a conscious delay is allowed for
divergences to be registered in the sub-schema.

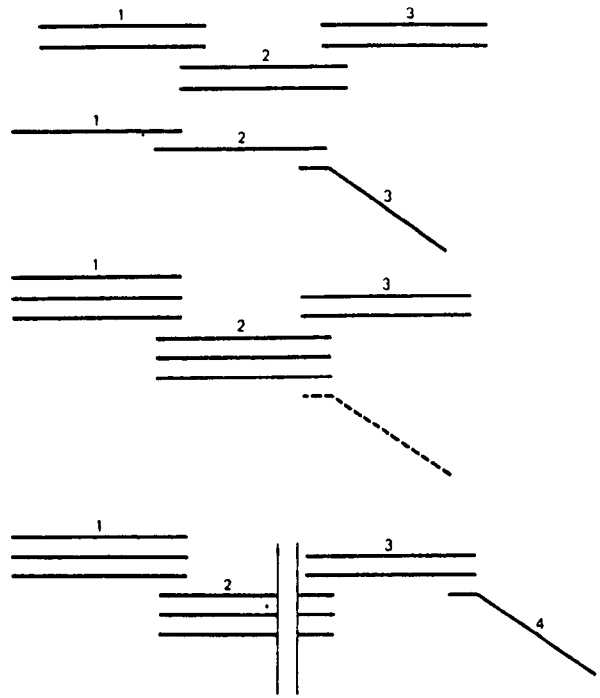


fig.(1.14)The system of self maximisation

(Source: Smith, 1974, p.38)

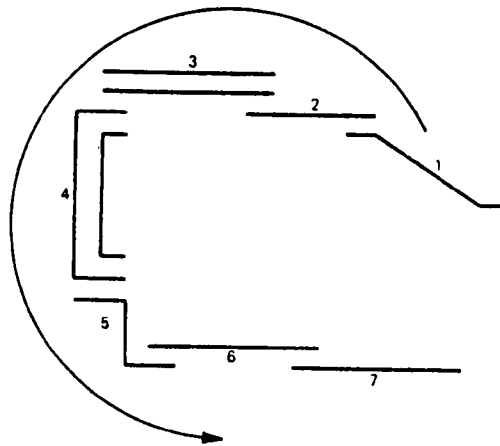


fig.(1.15)The visual array in perception.

The arrow shows the usual way of perceiving the
visual array.

(Source: Smith, 1974, p.39)

CHAPTER 1: NOTES AND REFERENCES

- 1 Smith, Peter F., The Dynamics of Urbanism (Hutchison, 1974), p.15.
- 2 Schulz, N., Intention in Architecture (Universitetsforlaget. Allen & Unwin Ltd., 1963), p.28.
- 3 Goodey, B., Perception of the Environment (Research Publications Services Ltd., 1971), p.1.
- 4 Joseph McHugh, 'Environmental Perception: Towards an Understanding of Subjectivity in the Built Environment' (unpublished dissertation, Mackintosh School of Architecture, Glasgow University, 1978), pp.10-11.
- 5 See Graham, Clarence H., Vision & Visual Perception (John Wiley & Sons, Inc., 1965), p.11 and Gregory, R.L., Eye and Brain (Weidenfeld & Nicolson, London, 1979), p.51 and Vernon, M.D. The Psychology of Perception (a Pelican Original), pp.12-13.
- 6 See Wilson, John R., The Mind (Time International Nederland, N.V., 1968), p.48 and Gregory, R.L., (1979) Ibid., p.64.
- 7 Anand, Mulk R., Seven Little Known Birds of the Inner Eye (Charles E. Tuttle Company, Rutland, Vermont: Tokyo, Japan, 1978), p.30 and Graham, Clarence H., (1965), ibid., p.42.
- 8 Gregory, R.L. (1979), ibid., p.9.
- 9 See Gregory, R.L., ibid., p.10, and Arnheim, R., Art and Visual Perception (University of California Press, Ltd., London, England, (1974), pp.48-49, and Arnheim, R., The Dynamics of Architectural Form (University of California Press, London, 1977), pp. 110-111, and Anand, Mulk R., (1978), ibid., p.22, and Schulz, Norberg (1963), ibid., p.42.
- 10 Gregory, R.L., (1979), ibid., pp.49-63.
- 11 See Gregory, R.L., (1979), ibid., pp.65-67, and Hesselgren, Seven, The Language of Architecture, Vol. 1 (Applied Science Publishers Ltd., London, 1969).
- 12 Anand, Mulk R., (1978), pp.32-34.
- 13 See Gregory, R.L., (1979), ibid., p.37 and Wilson, John R., (1968), ibid., p.19.

- 14 See Gregory, R.L., (1979), *ibid.*, p.39 and Wilson, John R., (1968), *ibid.*, p.31.
- 15 Wilson, John R., *ibid.*, p.preface.
- 16 *Ibid.*
- 17 *Ibid.*, p.16
- 18 *Ibid.*
- 19 Gregory, R.L., (1979), *ibid.*, p.45.
- 20 See Gregory, *ibid.*, p.48 and Smith, Peter F., (1974), p.16.
- 21 *Ibid.*, p.11.
- 22 *Ibid.*, p.21.

2.1 PERCEPTION IN LIFE

Perception as in Smith, (op.cit. p.15) is the use of memory to make sense of life's phenomena. Our behaviour in life is the direct interpretation of these feelings and emotions that are involved in the perceptual process.¹

Man's experiences in life and his reactions to them have structured his memory, which is a store in which different information is classified.

Since its beginning, the field of perception has depended on the research of psychologists and philosophers. As in Goody, (op.cit. p.1) psychologists have contributed a mass of data concerning man's experiences in life. Philosophers also contributed similarly, as in Langer (1953, p.3): "philosophical reflections on art contribute a large and fascinating literature, ranging from learned treatises to pure belles-lettres - essays, aphorisms, memories, even poetry".²

Philosophy as a field has concerned itself with sensation and conception which are the two basic processes of perception.³

Perception, as Gregory says:

Go(es) back to the beginning of human thought, and remain(s) central to the discussions of philosophers concerned with how we come to know the physical world....understanding of perceptual processes comes not only from the techniques of experimental psychology, but also from physiology. ⁴

Psychological experiments, as Gregory says, are of particular value in showing what kinds of information are used to judge the shape, size, distance and rate of movement of objects.

German Gestalt psychologists and their school are of great importance when discussing perception. The word "Gestalt" is a common German noun for shape or form. As in Arnheim (1974) the word "has been applied since the beginning of our century to a body of scientific principles that were derived mainly from experiments in sensory perception".⁵

Schulz in his book, Intension of Architecture (1963), says that "gestalt quality" as an idea was developed by the two psychologists Wertheimer and Kohler who proved that an element's identity changes according to the whole context of which it forms a part. In other words, the whole defines and determines the parts.⁶

Psychologists contributed a mass of data concerning perception. However Goody criticises their research in the environmental field as being a subject which should be left to others with more experience in this area. Arnheim, as an artist, can be cited as an example to assure Goody's viewpoint, being an artist who had special interest in psychology. Arnheim, in the following lines, speaks of himself, saying:

As long as I can remember I have been involved with art, studied its nature and history, tried my eyes and hands at it, and sought the company of artists, art theorists, art educators. This interest has

been strengthened by my psychological studies. 7

As in Goody (op.cit. p.1) psychologists have nevertheless contributed their share to the field of perception. However, their application in the environmental area is modest.

As Arnheim indicates, "some psychologists have taken a professional interest in the arts. But it seems fair to say that for the most part they have contributed only marginally to our understanding of what matters".⁸

Our basic sensational criteria as Arnheim says, depend on these phenomena which have been perceived earlier since the beginning of life. As mentioned before, our memory contains different schemas of which every one is considered a data package of a special area of information. In daily life as Schulz says:

We usually act on the basis of direction, size and distance, and only a particular attitude enables us to combine these phenomena into a superior space - conception. Such a space schema in a developed form is capable of defining the relations between things by indication link right and left, behind and before, over and under, and also through considering the relative sizes. 9

Perception is a process in which emotions are involved. As Anand says:

The experience involves association of nerves, vibrations, feelings, emotions, ideas and other subtle states of the psychophysical life, one leading to the other, and back again, until you are inactive to understand it perfectly. 10

It is commonly known that the five senses alone comprise the perception process; conversely the situation is different where soul and heart come into operation.

According to Anand,

'The rhythm bird', follows the seminal possibilities, such as those from the various past and present rhythms. This fourth bird allies itself to or dissociates the body soul from the organised pattern The fifth, the heart bird, is already filling the personality with the excitement of the Gestalt. If its energies have been aroused by the art experience, the blood flow quickens. 11

Perception and emotion differ from each other. As Hesselgren says: "contrary to perception, emotions are not localised in one's body. They exist in his mind".¹² Hesselgram adds that sensation is the cry of which emotion is the echo, so intimately emotion is connected to a sensation.

There is a strong relation between our perceptual ability and our age. As in Schulz (1963, p.48) Piaget's experiment with the water-bottle shows that a big child is able to perceive the relation between the water surface and the bottle when it was tipped, a fact which a younger child could not be able to comprehend.

2.1.a INFLUENTIAL FACTORS IN PERCEPTION

There are many factors which affect the process of perception. These factors as summarised by Schulz are: "the attitude", "The cultural and social influence" and finally, "Learning and age", as basic factors in building up our schemas.

(i) Attitude

Perception is paradoxical. The logic behind this is

that we might, for example, judge a thing unsatisfactorily according to our attitude and our mood. If we are in a bad mood pleasant things may seem repulsive. Conversely, if we are in a good mood bad things may seem fantastic. A coin can be viewed differently in the eyes of a poor child than in those of a richer child.

The tendency to over-estimate or to under-estimate things depends upon our attitude and our mood at the time.

The common experience, although seen by different persons in different ways at one time, will be based upon their visions, all of which will be similar. Variation in vision follows the individual's attitudes.

(ii) The cultural influence

As in Schulz (1963, p.38) the physical objects differ in the various societies and above all, they participate in different human actions. Children growing up in a metropolis and peasant children in rural society thus have different experience of physical things.

Within every society there are common socialised criteria by which individuals can perceive viewed objects. Under what Schulz has called "socialisation" it was stated that:

1. The less extensive and the simpler the coherence-system the greater the chance that we may perceive a coherent single object.

2. The sign is a medium by which the individual can

understand the significance of a complicated theme within his society.

3. Every society is governed by a set of rules by which the individuals can perceive things and can behave accordingly.

Socialisation therefore implies that we learn to behave in particular ways towards particular things.

(iii) Learning and Age

Our memory which consists of different schemas was built up throughout continuous learning. As man gets older, his memory becomes more intricate.

Learning is very important in the perceptual process. As Schulz says, "to 'learn to see' above all means to acquire schemata which allow an adequate intentional depth".¹³

The 'simplest perceptual schemata' are a result of senso-motoric activity, the 'higher' schemata are based upon communication of experiences and cultural traditions.

The first schemata of a child as Piaget, the Swiss psychologist asserts are a result of the child's concrete operations, and not an intellectual abstraction of the properties of things.

The schemata in general, as Schulz says are based upon similarity between phenomena. According to Piaget 'proximity' is the first schema to be acquired, 'since constancy' is a schema which results from the operational

experience that things maintain their size when moved. Simple gestalt qualities like elementary geometrical figures are obviously based upon schemata 'enclosure' and 'continuity'. Perception of complicated forms, like works of art, needs schemata which can only be built through special training.

2.2 PERCEPTION IN ART/ARCHITECTURE

Art as a subject is a part of our life. If man wants to understand the significance behind a viewed artistic work, he should first try to understand the meaning and the power that is owned by those basic elements which make them work like shape or colour or form.

Psychologists and philosophers as mentioned earlier have participated greatly in providing data about human perception in all aspects of life. However, their application in art particularly has been insufficient.

As in Arnheim (1974, p.6) every sane man has a special capacity to deal with life artistically. To the psychologists, as Arnheim refers, this means that the study of art is greatly needed, being an important part of man's life.

Philosophy as in Langer (op.cit, p.3) has concerned itself greatly with art.

In the process of man's understanding of art work, there are some questions that must be raised. These questions as Langer summarised are: "what are the materials

of art? Which is more important: form, or content? What is beauty? What are the canons of composition? How does a great work of art affect the beholder?" These questions, as Langer says, are legitimate and the purpose of the philosophy of art is the answer to them.

As in philosophy, psychology is also concerned greatly with art problems, and if an artist wants to succeed in his career he inevitably should have an interest in psychology and philosophy. According to Arnheim (1974, p.8), "If one wishes to be admitted to the presence of a work of art, one must, first of all, face it as a whole. What is it that comes across? What is the mood of the colours, the dynamics of the shapes?"¹⁵

The import of the meaning of a work of art cannot be built up like the meaning of a discourse, but must be seen first as a whole. According to Langer, it is anticipated that a work of art will be viewed as a complex whole; further contemplation can reveal complexities of the piece, and of its import.

A work of art is a single, indivisible symbol. It is as Langer says: "Composite, analysable into more elementary symbols - sentences, clauses, phrases, words, and even separately meaningful parts of words: roots, prefixes, suffixes, etc., selected, arranged and permutable according to publicly known "laws of language".¹⁶

Plastic art as Langer says, like all other art, shows an interaction between its individual parts, things which were identified by artists as "tensions". The relations of

masses, the distribution of accents, direction of lines, indeed all elements of composition such as colour, material, form, etc., create what can be called 'space-tensions'.

Architecture as a plastic art is a good model of space-tensions. It uses form, colour, material, etc. Hence architects as artists are required to understand the abstract of those varied elements in their different moods.

The language of all types of art is more or less similar. Drama in the sense of form is similar to architecture. As in Langer (1953, p.366):

Drama is a great form, which not only invites expression of elemental human feeling, but also permits a degree of articulation, complexity, detail within detail; in short: organic development, that smaller poetic forms cannot exhibit without confusion. 17

Architecture is generally regarded as an art of space.

Architecture, in Langer's definition, is a plastic art, and its basic concern is always, unconsciously and inevitably, an illusion; a totally imaginary thing or conception translated into visual impressions.

According to Arnheim (1977, p.4) Architecture in all its aspects is a fact of the human mind.

Deep psychological understanding of the factors that determine a person's state of mind make us able to differentiate between an architectural experience here and another there. The perceptual elements have their own sharp entity and they maintain it whatever the circumstances are. In the next few lines Arnheim shows us how it is important for the architect to understand the emotional characteristics

of the perceptual elements.

The perceptual elements persist whatever the circumstances, and only when their fundamental aspects are known can we begin to understand an individual instance. How can one hope to realise what distinguishes the experience of the Parthenon in the Athens of the fifth century B.C. from that of a Gothic cathedral in the Bourges of A.D. 1300 if one has no clear notion of the dynamic relations between vertical and horizontal? Not knowing what the Greeks or the French reacted to, how can one speculate on what they saw? 18

2.3 THE LIMITS OF PERCEPTION IN THE DESIGN PROCESS

The process of perception has a great influence upon the design operation in general. What is of concern to us here is how its limits can affect the architects' and the planners' minds when they proceed into the design process. And what are those factors which influence their decision through that process concerning the constraints of perception?

The first limit of perception which can be discerned in the design process is that we do not perceive an isolated fragment; conversely we perceive wholes. The coherence system as in Schulz (1963, p.34) suggests that we do not perceive separate discrete events but contrarily we perceive relationistic wholes. That meaning signifies to us how Gestalt theory came to existence.

The second limit of perception as in Schulz (1963, p.34) is that the less of complexity and the simpler the architectonic-form is, the greater is the chance for perceiving the correct unified subject.

The third limit is that we are fully attracted by

seeing a beautiful thing, in which the aesthetic dimension means, logically, simplicity and an orderly relation between its pattern in the schema or in the group of schemas.

The fourth limit is that although simple forms are preferable to the perceptual process it is however not absolute as Schulz indicates. Peculiar and new things as a stimulus cause surprise and excitation which, as Smith states (1974, p.18) are essential to mental health and grows.

The fifth limit as in Schulz,(1963, p. 46) is that a rational relationship between the varied, and the repetitive phenomena in the visual array lead to the construction of a constant form.

The sixth limit as in Smith (1974, p.11) is that our ability to create or to contrive a creative idea depends firstly upon the abundancy of our previous experiences and the richness of our knowledge.¹⁹

The seventh limit according to Smith is that a redundant repetition of the same phenomenon such as shape, form, or colour, leads to "subliminal perception" in which our perceptual ability calms down and we sense monotony.²⁰

The eighth limit as in Ellinger (1980, p.27) is that disorder caused by unrestrained diversity is confusing and emotionally repellent. We accept diversity up to a certain limit which if exceeded we feel irritated.

The ninth limit as in Ellinger is that although we need the play of opposing forces in order to construct a balanced

constitution, on the other hand we emotionally seek the perception of a sense of dominance where the opposition of equal forces creates tension and strife, precluding a sense of oneness.

The tenth limit is that we are emotionally pleased by seeing a rhythmic constitution, in which one can experience a sense of continuity, consistency and unity.²¹

CHAPTER 2: NOTES AND REFERENCES

- 1 Lee, T., Psychology and the Environment (Methuen, 1976), p.50.
- 2 Langer, Susanne K., Feeling and Form (Routledge & Kegan Paul Limited, 1953), p.3.
- 3 Hesselgren, Sven, The Language of Architecture (Applied Science Publishers Ltd., London, 1969) p.11.
- 4 Gregory, R.L., Concepts and Mechanisms of Perception (Gerald Duckworth & Co. Ltd., 1974), p.50.
- 5 Arnheim, Rudolf, Art and Visual Perception, A Psychology of the Creative Eye (University of California Press, 1974), p.5.
- 6 Schulz, Norberg, Intention in Architecture (Universitesforlaget. Allen & Unwin Ltd., 1963), p.34.
- 7 Arnheim, R., (1974), *ibid.*, p.3.
- 8 *Ibid.*
- 9 Schulz, Norberg, (1963), p.47.
- 10 Anand, Mulk R., Seven Little Known Birds of the Inner Eye (Charles E. Tuttle Company, Rutland. Vermont: Tokyo, Japan, 1978), p.18.
- 11 *Ibid.*, p.22.
- 12 Hesselgren, (1969), *ibid.*, p.298.
- 13 Schulz, Norberg, (1963), *ibid.*, p.42.
- 14 Langer, Susan, (1953), *ibid.*, p.4.
- 15 Arnheim, Rudolf (1974), p.3 and p.8.
- 16 Langer, Susan, (1953), *ibid.*, p.369.
- 17 *Ibid.*, p.366.
- 18 Arnheim, Rudolf, The Dynamics of Architectural Form (University of California Press, London, 1977), p.5.
- 19 Smith, Peter F., The Dynamics of Urbanism, (Hutchison, 1974), p.11.
- 20 *Ibid.*, pp.30-34.

21. Ellinger, Richard G. Colour Structure & Design (Van Nostrand Reinhold Company 1980), p.27.

PART 2

PERCEPTION IN ARCHITECTURE

INTRODUCTION

My first concern in the previous section was confined to understanding the basic principles of man's perception and the limits of these operations in the design process. However, in this part my interest will be concentrated on understanding the identity of the architectural elements within the perceptual context. As I understand the process of design, it is mainly influenced by two factors: the first of these factors is the human mind's capacity to understand what is happening around him and the constraints which control the mind's ability through the process of perception. The second factor which influences the designer's decision, is the material in its varied forms as a phenomenon which stimulates us differently according to its potentiality and its abstract qualities. As mentioned earlier, this part contains three chapters.

These chapters respectively are: The Architectural Elements and Perception, the Dynamics of Architecture and finally Architectural Aspects of Perceptual Connotation. In the first chapter I will be examining most of the architectural elements which contribute to the process of design such as colour, lighting, texture proportion and rhythm. In the second chapter I will try to reveal the potentiality of the line, the direction, and the form - these being the tools by which the designer is able to bring his ideas to life. In the third chapter I will try to examine the meaning of the three following terms: expressiveness,

symbolism and character, as terms which have special perceptual implications. It is understandable that all these terms are interwound with each other strongly. There is no symbolism or character without expression. In my investigation in this chapter I will try to abstract the philosophy of these terms and their perceptual connotation.

3.1 THE PRINCIPLE OF UNITY

The virtue of the principle of unity lies, as Lewis (1968, p.225), says,

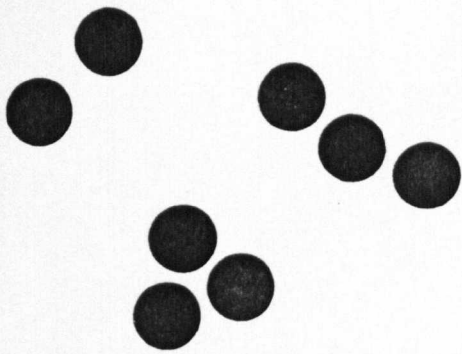
Its apparent correspondence with the laws of the nature and its strength, in its power to construct the parts within the whole, a primary aim of architectural aesthetic. It is at once a quality and a shaping force, and as an abstraction universal in its reference. ¹

The principle of unity and the theme of 'whole' was the great concern of gestalt psychologists, who stressed that we experience the environment as consisting of objects or 'whole'. The term 'gestalt-quality' was introduced by Von Ehrenfels to indicate the fact that a whole (e.g. a melody) or a visual figure is something more than the properties of its elements. ²

The principle of unity as Smithies says is concerned with visual composition in design, by which the relationships of the visual elements used will be considered the basic theme and the subject matter of this chapter.

According to Smithies (1981, p.6), the visual elements by which the principle of unity is established are: texture; colour; tone; direction and proportion. ³

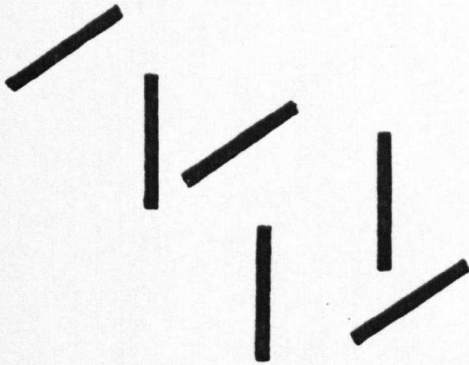
There are different aspects of unity. According to Smithies these aspects are: dominance; harmony; proportion; vitality and balance.



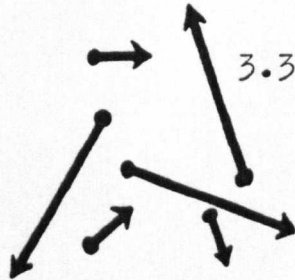
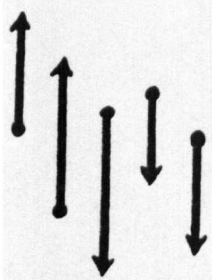
3.1

Fig. (3.1). Unity
by Proximity.
Fig. (3.2). Unity
of orientation
Fig. (3.3). Unity
of direction.

(Source: Arnheim,
1974, p.82.)



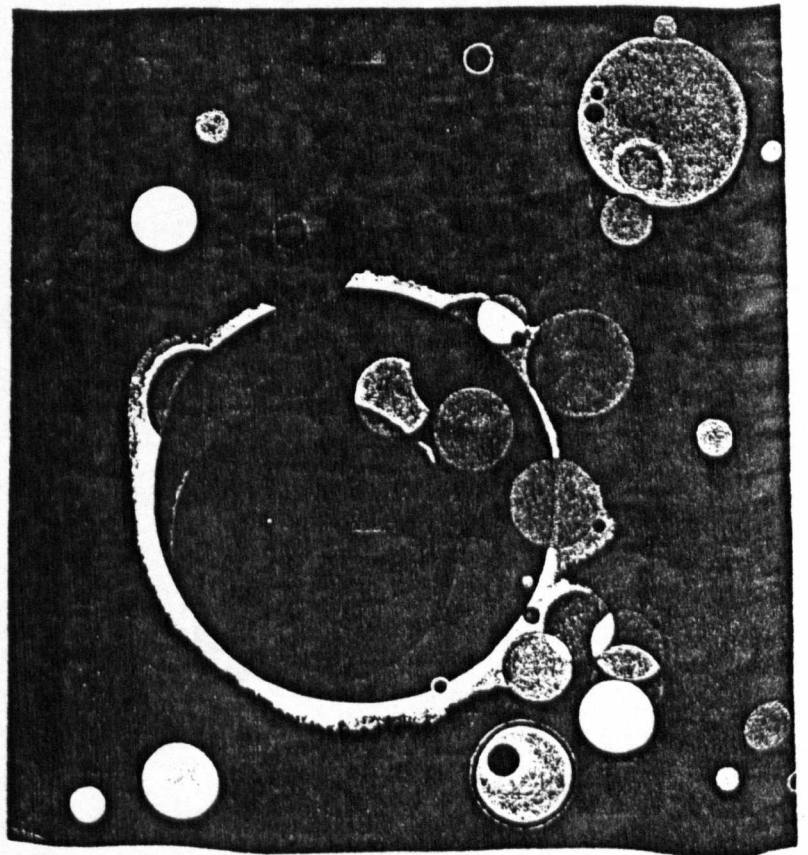
3.2



3.3

Fig. (3.4). Kandinsky.
Several circles. An
attempt to establish
unity by repeating the
circle in different
size, and tone.

(Source: Lauer, 1985,
p.14.)



3.1.a DOMINANCE

According to Smithies, dominance may be provided by the effect of using one colour, tone, texture, direction, and finally it can be achieved by imposing solid over void or vice versa? As in Schulz (1963, p.143), the Medieval church dominated the town not only because of its size, but because of its unique east-west orientation which often differed from that of the other buildings. Dominating solids by voids or vice versa is very important if we intend to establish unity. As in Hesselgren,

It is a common experience for architects to find that a Gestalt, a facade for example, ought to be composed in such a way that one formal part dominates. The facade ought to be either predominantly wall with windows in it, or predominantly glass with bits of wall inserted below the windows. 4

Unity (Issac 1973, pp.95-98) may result from the use of a single dominant material, colour, texture, pattern, and direction.

3.1.b HARMONY

As in Smithies, harmony as an aspect of unity can be achieved by using the careful relationship of different colours, or by establishing a directional totality in which the directions of all the parts fuse into one dominant direction. According to Hesselgren (1969, p.205) a harmonic composition is one aspect of unity in which the different parts of an object speak the same emotional language.

Harmony may be achieved by using a matching textural

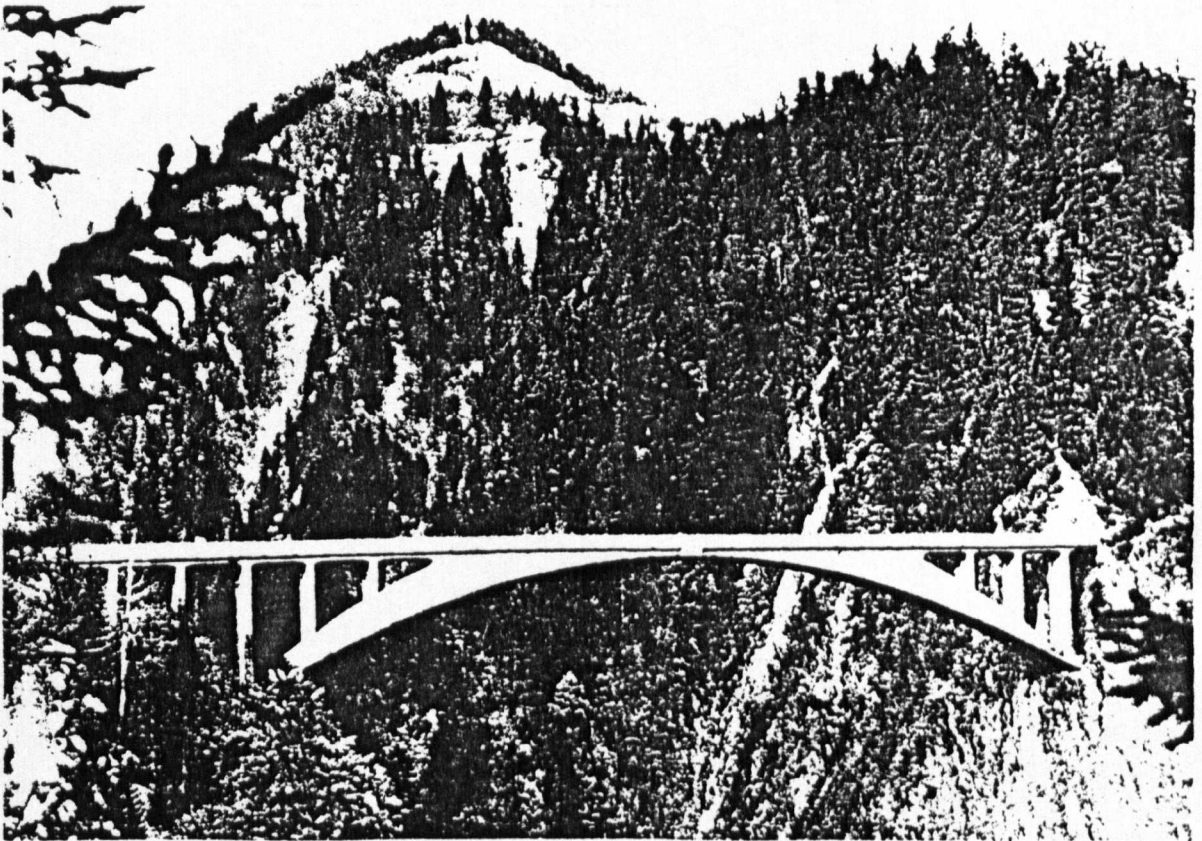


Fig. (3.5). Dominance and Unity. The Salginatobel Bridge by Maillart is a bright example of sensitive contrasted relationship between an object and its background.

(Source: Hesselgren, 1969, p.175.)



Fig. (3.6). Church, Leningrad, USSR. An example of unity based on repeating one form - the dome - with variation of size and texture so that contrast and vitality were established.

(Source: Smithies, 1981, p.14.)



Fig. (3.7). Repetition and unity. An underlying unity can be experienced in El Greco's painting in which one direction was repeated within the same group that is based on 'proximity'.

(Source: Lauer, 1985, p.6.)

quality. However the overuse of harmony may lead, as Smithies says, to monotony.

3.1.c PROPORTION

As an aspect of unity proportion, as Smithies (1981, p.11) says, can establish a powerful element in providing harmony of composition. Greek architecture was strongly influenced by such concerns as the means of producing unified and harmonious forms. The Golden Section ratio can be used as a key by which a series of related shapes and forms can be established. As in Issac, "The repetition of a single proportional unit, e.g. A/A or alternating units A/B; A/B and various rhythms, A/B; B/A and so on, depending on the number of different elements used, and spaces left".⁵

3.1.d VITALITY

This aspect of unity in visual design is provided as Smithies indicates, mainly by contrast of colour, tone or texture, of direction and proportion, and between solid and void. According to Simonds, "Early in our study of design we learn that the best features of an object can be emphasised through contrast".⁶

Just as the over-use of harmony can lead to monotony, so the use of extravagant contrasted elements can impair harmony and tend to produce a multiplicity of equal interest.

Classical and Gothic architecture have produced as Smithies says, many examples of harmony and vitality

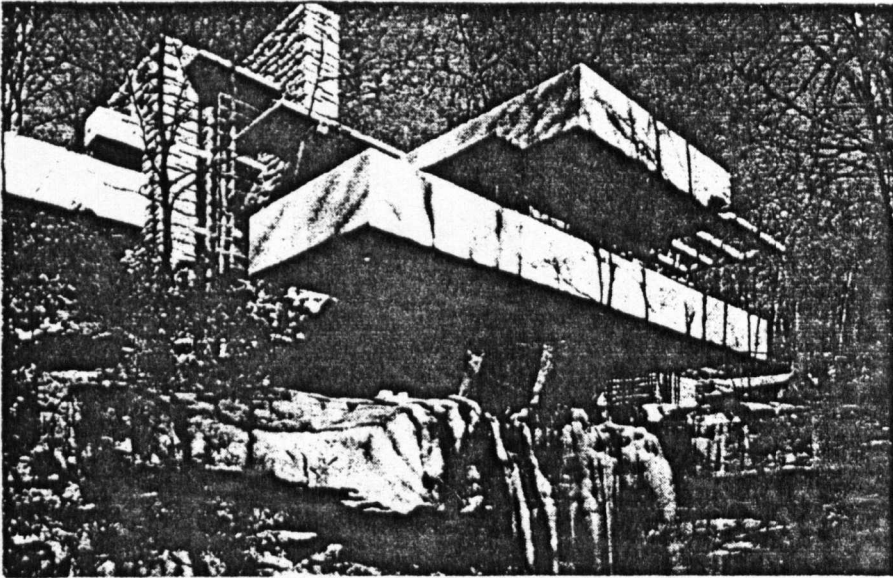


Fig. (3.8). Contrast & Unity. Wright's house at Pennsylvania shows a bold aspect of unity via using contrasted vertical and horizontal elements. Unforgettable also is the fact that this house is an aspect of organic architecture, being allied itself with nature.

(Source: Smithies, 1981, p.15.)

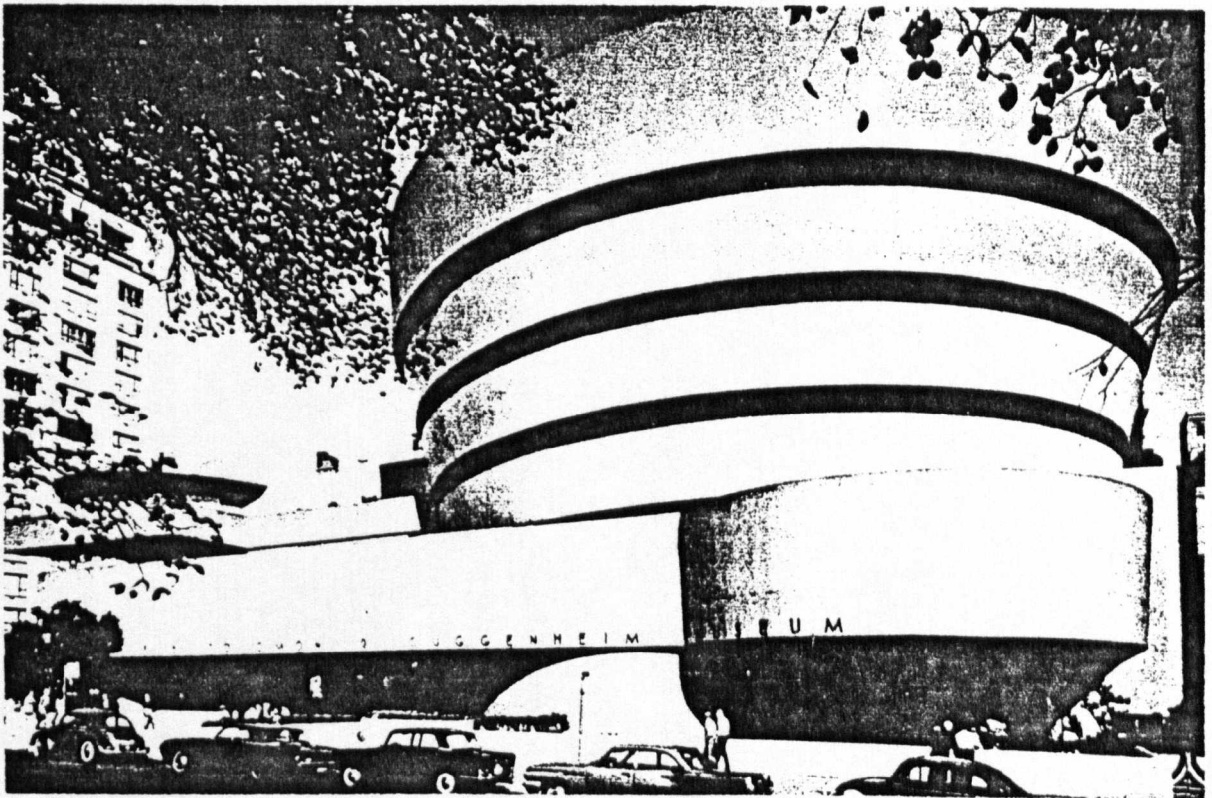


Fig. (3.9). Unity & Repetition. Wright's building shows a powerful coherence and unity which accompanies vitality through the sensitive use of the curve.

(Source: Lauer, 1985, p. 5)

combined together to establish a unified rhythmic and lively form.

3.1.e BALANCE

As in Smithies (1981, p.14), this aspect of unity usually does not become a problem, being mostly fulfilled as the requirements for movement, under function, and of structure, under stability, lead us towards a balanced massing at least. A finer effect of balance can be given throughout using a rational combination of solids and voids or by the sensitive use of the visual weight of materials. Unity as Issac states, may result from the establishment of a balanced symmetrical or asymmetrical composition.

According to Smith (1979, p.13), conceptulising these forces which act within any architectural structure derives partly from the experience of the mechanics of the human support and movement system.

Perceptually a balanced object has a physiological connotation: As in Smith (1979, p.13),

Arnheim, true to the gestalt tradition, goes much further by proposing that this state of balance is perceived as such because the pattern (any visualised balanced pattern) excites an electro-chemical force field in the cortex which is 'typologically similar' to the pattern itself. If electrical forces establish equilibrium we said to achieve aesthetic satisfaction, the satisfaction of 'pragnanz' or 'good gestalt'. 7

Unity, as in Issac, may be achieved by using a form of strongly contrasted intensities of lighting, in which a highly illuminated object for example is exhibited

against a dimly illuminated background. Conversely, unity may be destroyed by a badly considered lighting.

A series of unrelated and complex components can establish an aspect of unity by constituting a group, or being assembled as Issac says, within a frame.

Unity can be destroyed if the underlying basic theme is lost, or when, as Issac indicates, the interest is lacking or diverse to the extent that the components involved slip or degenerate into separate entities.

A rational contrast may exist between two objects where one of them works as a 'subject matter' and the other works as a back or foreground by establishing a unified form. Millart's bridge as a 'basic theme' against the mountain as a 'background' is a clear instance exemplified by Simonds (1961 p.24).

Unity does not mean the generalisation of one aspect of activity or function through the whole building. On the contrary, "(unity consists) of a diversity of uses, a diversity submitted to a motive principle which unites the different functions of each member or organ towards a similar aim".⁸ Unity and diversity of actions within a plan have been affirmed by Le Corbusier who says: "Law and unity are the product of diversity of movement, of life, held together by a great mathematical axis running through them".⁹

A repetition of the same cell can establish a unified form, by which an organic whole can be attained. The crystalline forms of Le Corbusier's cities as in

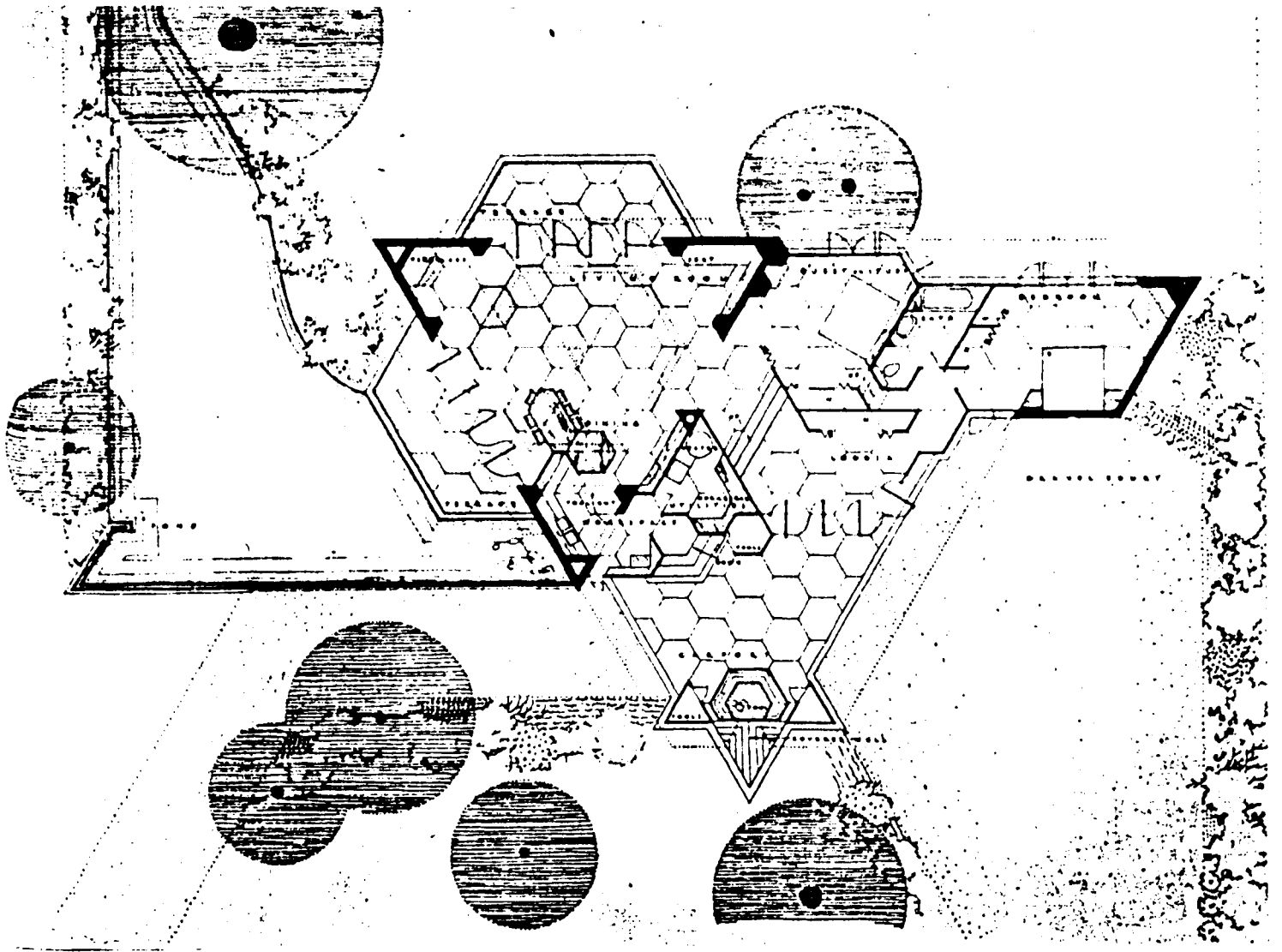


Fig. (3.10). The organic Unity. Wright's house for Mr. and Mrs. Vigo Sundt, Madison, Wisc. shows the lawful and the canonic mood of unity that is based upon repeating one cell.

(Source: Smithies, 1981, p.19.)

Lewis (1968 p.225), can be quoted as an example in which a series of repeated geometrical forms were linked to a predominant unitary axis.

3.2 PERCEPTION OF COLOUR

From the perceptual viewpoint, colour has a great physical impact upon our emotion and consequently our responses by which our behaviour is subjected. As in Smith (1979, p.15),

The brain seems to have the facility to work out an equation which relates area to saturation in terms of colour, texture or intricacy of visual events. A large area of low colour saturation may balance a much smaller area with a high concentration of visual intricacy.... This may be because there is equivalent gross cortical activity, but it must be repeated that this is conjecture.¹⁰

Some experiments as in Arnheim (1979, p.368), have demonstrated a bodily response to colour. For example, it was discovered by Fere that muscular power and blood circulation are increased by using coloured light, in sequence from blue with the lowest level of response through green, yellow, orange and red. These findings were confirmed by Goldstein. According to Arnheim,

The same is true for observations by Kurt Goldstein who found in his neurological practice, for example, that a patient with a cerebellar disease suffered disruption of her sense of balance, became dizzy, and was in danger of falling when she wore a red dress - symptoms that disappeared when she wore green.¹¹

As a result of his experiments, Goldstein concluded

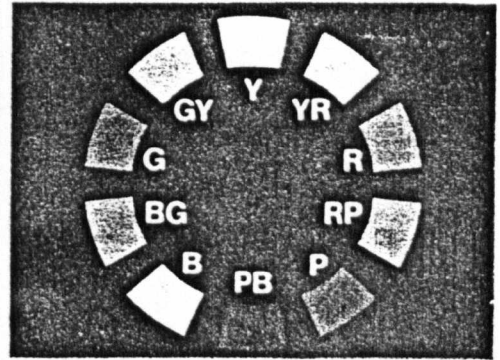
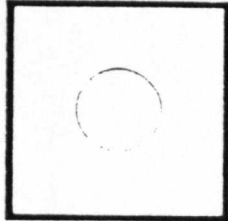
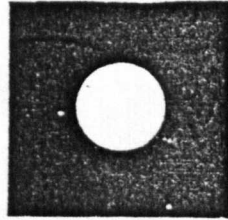
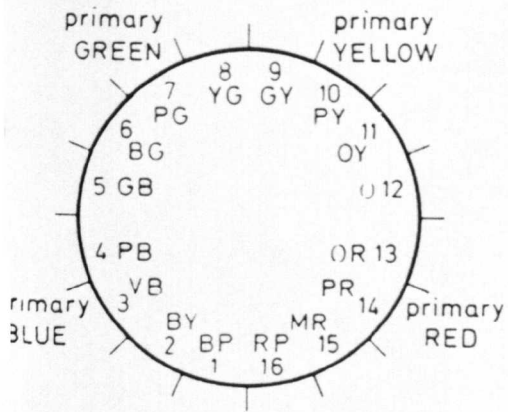


Fig. (3.14). Runges colour wheel.

(Source: Osborne, 1980, p.71.)

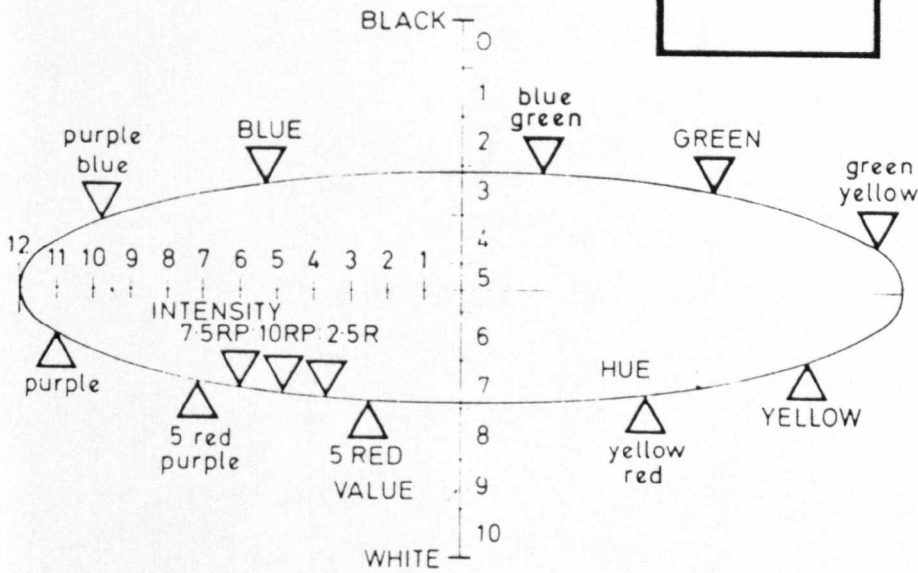


Fig. (3.11). Colour circle; brightness consistency; Munsell colour system.

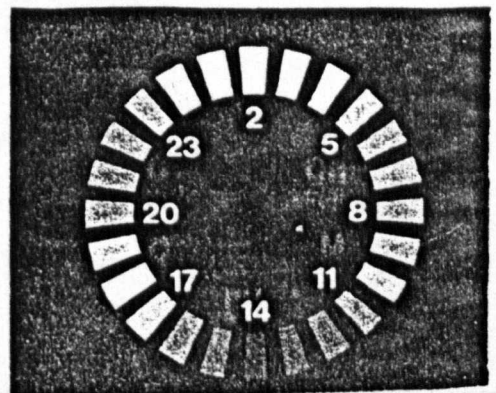
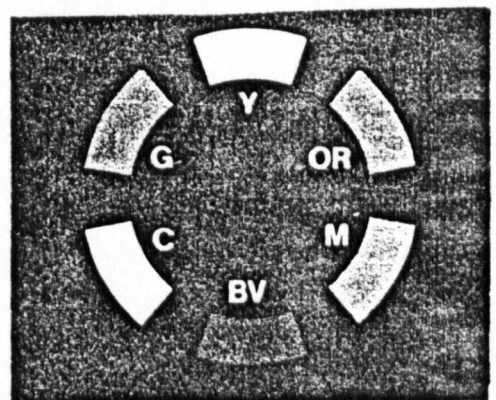
(Source: Issac, 1971, p.46.)

Fig. (3.12). Ostwald's colour wheel.

(Source: Osborne, 1980, p.71.)

Fig. (3.13). Munsell's colour wheel.

(Source: Osborne, 1980, p.71.)



that colours which correspond to long wave-lengths go with an expansive reaction, whereas the short wave-lengths make for constriction. Red as an example excites us strongly being of a correspondence to long wave-lengths, conversely to blue which correspond to short ones.

A fact concerning colour is that it has an associational quality by which different symbolic situations can be experienced. As in Meyer (1973, p.88), black stands for mourning in most western societies but for rejoicing in some African and eastern civilisations, where white stands as the colour of mourning. Red, as Arnheim indicates, is a passionate stimulating colour. A relentlessly glowing passion colour as Kandinsky says, and a solid power within itself. Red is mostly used for attracting attention, being of a high stimulation within the cortical field of forces. This fact lies behind its use in the most important part of the machine particularly in buttons to facilitate, as Meyer says, its discovery when the intention is to operate or to stop it. Red coloured with a touch of blue acquires an "intolerable presence". The reason being that it was used by the high clergy to support them in their advance to the heights of the purple of the Cardinal because of its property of irresistibility. Red.yellow as Arnheim indicates, is best suited to give the eye the feeling of warmth and delight, whereas a red.blue makes us

restless rather than animating us. In most western societies, white as Mayer says, stands for innocence and purity. In tropical countries white has been used as a protective colour against heat because it has a high reflective quality. Warm yellow, the colour of gold, in Van Gogh's opinion, symbolises joy, richness and glory.¹² Conversely pale yellow stands for envy, greed, and cowardice. Green has traditionally been known by the colour of hope, based as Meyer says, on the relaxing properties of nature. Emotionally a nasty green stands for envy and jealousy. Being a soothing colour, green has been used widely in institutions such as hospitals and schools, because of its associational quality as the colour of life, youth, and health. Blue is considered, as Meyer says, the colour of the intellect, clear, fresh, logical attitude, and the reason for this lies in the direct relation between that colour and the colour of the sky which enable a person to think with a clear mind. According to Arnheim, dark blue sinks into deep seriousness. Violet was described by Meyer as an unbearable colour that is difficult to see in long areas, stands for repentance and preferred in fashion. As purple violet is a stirring colour it is for this reason the church and sovereigns have used it to show their power in public.

An important fact about colour association is that it goes back to the beginning of life where primitive

people used it in a situation of different context, while there were colours that symbolised power and evil, there were colours used to heal the sick and those which can cause success or disaster.

Mixing colours as a technique for having a new combination of colours for new associational meanings is greatly appreciated by artists, especially in the field of fashion. According to Arnheim, a bluish yellow or red tend to look cold, and the same is true of a yellowish red or blue. On the contrary, a reddish yellow or blue seems warm. Combining browns and blues as in Picasso's paintings in the Cubist period have become, as Meyer says, fully accepted now in fashion and in interior design.

Colour perception is considerably influenced by light. According to Issac,

When an object is illuminated, the spectrum colour nearest that of the surface colour will be reflected, while remaining light will be largely absorbed by the surface, e.g. white will reflect all of the spectrum colours and will resemble white light. Conversely, black will absorb the majority of the light waves resulting theoretically in the absence of light and the resemblance of darkness. 13

Persons of different characters have a certain bias towards certain colours and their preference can be attributed to the link between their emotions and the colours they like. According to Issac, a person of extrovert character has a preference for exuberent colours, while another person with an introverted character may have a preference for more subdued and

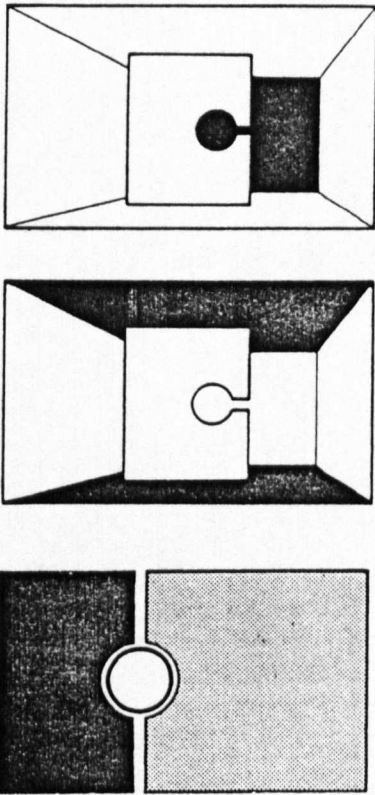
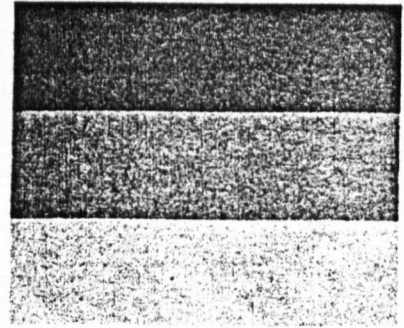
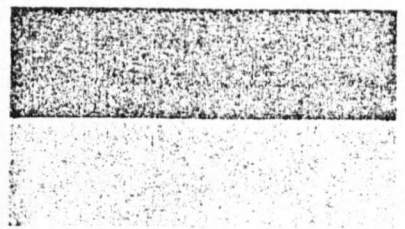


Fig. (3.15). Colour and Visual Weight. A plane, or focal point of interest can be created at the intersection of varied colours. Different colours can also balance each other visually around the intersection.

(Source: Issac, 1971, p.47.)



A



B

Fig. (3.16). Colour interval A & B shows a grey colour in one repeated interval from light as in B to dark as in A.

(Source: Hesselgren, 1969, p.79.)

quieter colours. The relationship between age and the use of colour is of great interest. According to Arnheim, young people may use coloured dress to show their vitality whereas, conversely, old people might prefer quiet colours. Colours vary in their use according to the situation in which they are used. Strong and bright colours can be used in an evening party, while dark or quiet colours can be used in a situation where dignity and restraint are required. Cultures that stress the difference between man and woman may produce distinction in colour use to suit both sexes.

Colour perception varies according to the prevailing conditions, e.g. the type of lighting, its intensity, its direction, its colour; and also on the nature of the reflective surface, e.g. its pattern and its texture. Colour perception of course is subject to the relationship between a figure and its background in a given situation. Colours used in juxtaposition affect each other and enhance the contrast between one another. For example, a strong colour would affect a neighbouring grey surface under the phenomenon known as 'complementary'.

An astonishing fact about colour is its dynamic effect. Kandinsky, as mentioned by Arnheim, asserts that a yellow circle will reveal a movement from the centre outwards, while a blue one develops a centripetal movement. According to Goethe, a dark object looks smaller than a brighter one of the same size.

The sensitive use of colour in manufacturing and industry has been accepted as an important fact.

According to Hesselgren:

The concept "colour conditioning" originated in the U.S.A. where it was found that colour enabled unskilled labourers to work better when it helped them to clarify their environment. Machines were painted in such a way as to give them a more definite character of figure against the background of their locality. Details which needed emphasis were painted in a way that drew visual attention to them.¹⁴

Colour language has been used in industry all over the world, and by its use different and agreed meanings were internationally standardised.

It was acknowledged that colours vary in their perceptual temperature. While there are warm colours we find cold colours as well. Dynamically, warm colours expand, while cold colours recede. Red, warm yellow, the colour of gold are warm colours, while blue, white and light yellow are cold colours. Warm and cold colours both have different psychological impacts upon human beings. As in Arnheim's interpretation, warm colours look like a warm person who seems to invite us, while cold colours look like well wrapped cold ones which keep us at a distance.

A unique Gestalten aspect of unity may be experienced when different colours come together to form a whole. The relationship between colour Gestalt and form Gestalt is very important. "This relationship may vary between two extremes. Either the colour Gestalt can

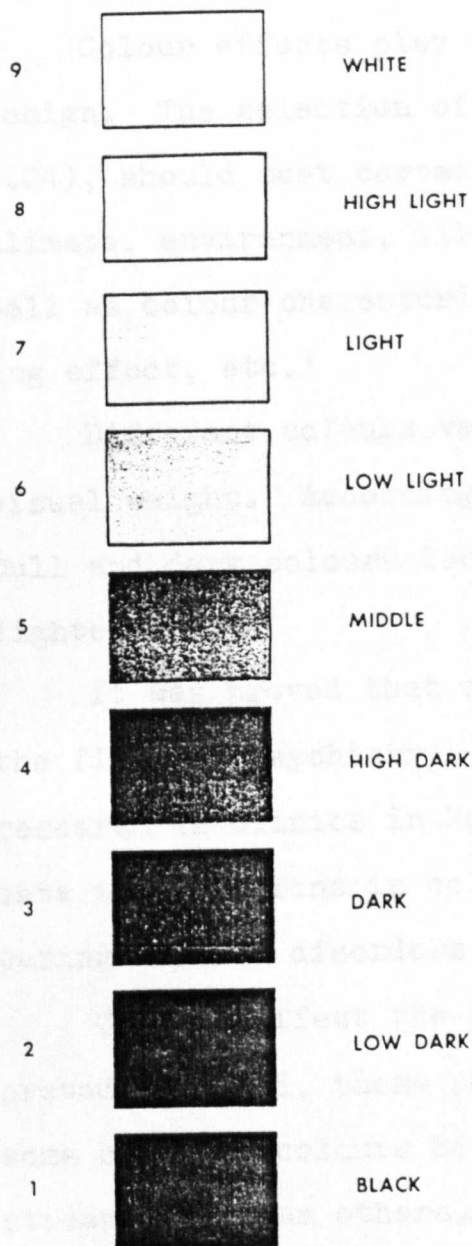


Fig.(3.18). The Dynamics of Colour. In this illustration one sees that the white figure looks larger in size than the black one, although they are geometrically equal.

(Source: Hesselgren, 1969, p.75.)

Fig. (3.17). The Value Scale.

(Source: Ellinger, 1980, p.13.)

co-operate with and clarify the form Gestalt, or they can contradict each other." 15

Colour effects play an important role in townscape design. The selection of colours as Perenyi says, (1973 p.24), should meet certain considerations, such as climate, environment, illusion, notion, perspective, as well as colour characteristics: 'enlarging, or contracting effect, etc.'

Different colours vary in their perceptual and visual weight. According to Hesselgren, (1969, p.285), Dull and dark colours look heavier and stronger than lighter ones.

It was proved that colours are of great benefit in the field of psychiatry. As Anand states (1978 , p.41), research in clinics in Moscow and Leningrad has produced data that sessions in colour therapy are of great use in curing psychic disorders and eye disease.

Colours affect the eye strongly and, as interpreted by Anand, these phenomena take place because some of these colours heighten the tempo of our bloodstream more than others.

Different intensities of the same colour can be treated as an interval between them. According to Hesselgren (1969, p.67), if two grey colours of different lightness are placed close to each other, the relation of lightness between them forms a new perceptual phenomenon called the colour interval.

Colours'expressions can represent the working forces of a structure visually. For example, a pillar, as Hesselgren says (1969, p.284), can be given a dark colour to indicate its strength and its resistance.

3.3 PERCEPTION OF LIGHT

Light is considered to be one of the most important elements that contribute effectively in the process of perception in Architecture. There are two different viewpoints which identify light. According to the physicists point of view, light which brightens the sky and consequently the earth is sent from the sun,¹⁶ but light in the psychologists' and artists' point of view is a self-contained phenomenon, i.e. a quality that is inherent in the objects themselves.

Light affects our emotions dramatically. According to Hesselgren,

The most important attributes of light perception are: direction of light, shadow, (perceived) light intensity and colour of light. The expression of joy in a painting can most effectively be supported by illumination from above. From this direction, light is most easily connected with sentiments of hope and optimism....when the sun is shining, a strong shadow is created which is immediately connected to happy feelings. When the sun disappears behind a cloud, the light becomes shadowless and is associated with a feeling of depression and gloom, perhaps even melancholy.¹⁷

Apparently strong light is connected to clarity and realism, conversely weak illumination is combined with mysticism and fear.

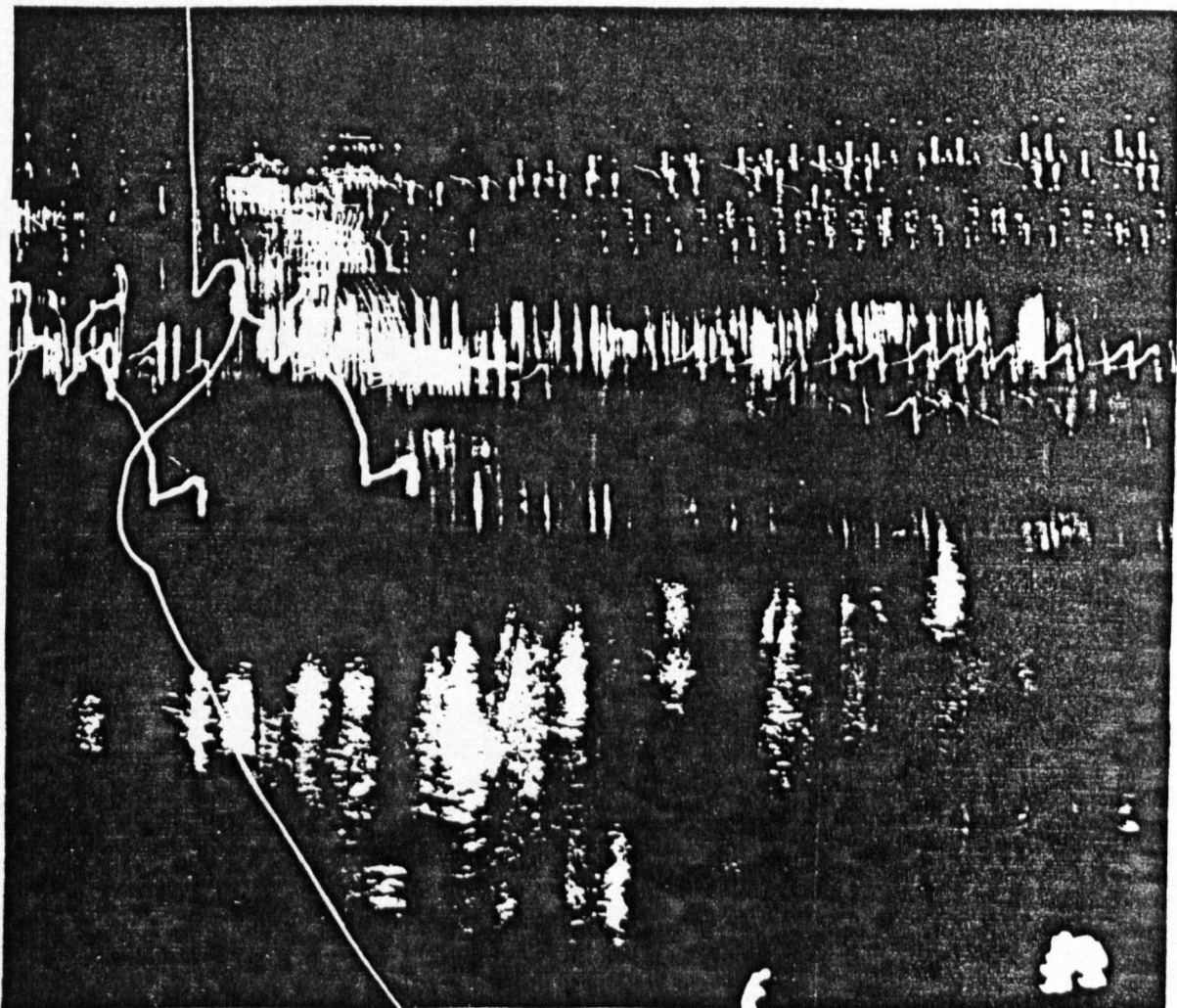


Fig. (3.19). Direction and Speed. This illustration shows scattered reflected light, sense of direction, speed and rhythm.

(Source: Meyer, 1973, p.68)

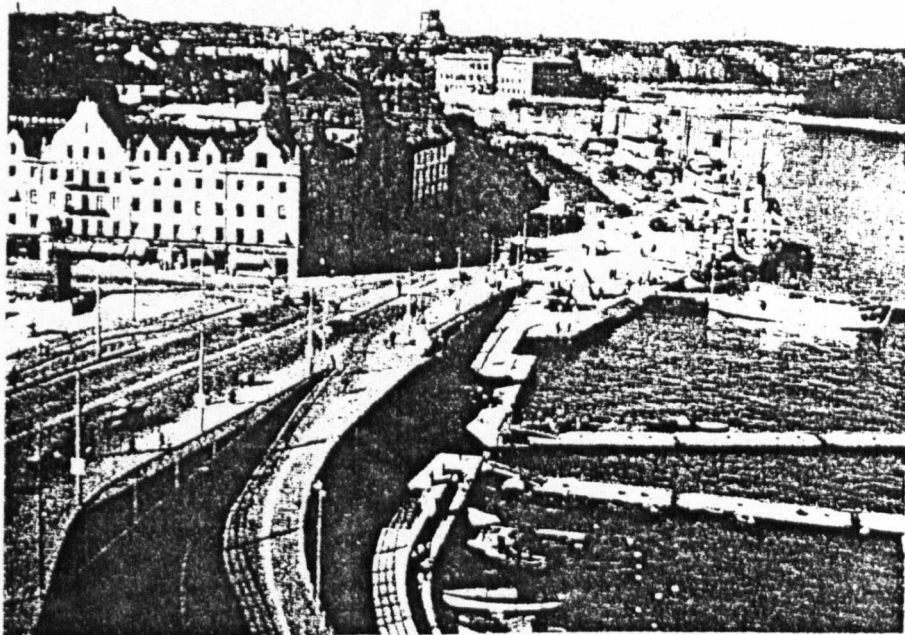


Fig. (3.20). Cheerfulness and Happiness. When the sun shines the scene becomes an excited experience of a lively, cheerful environment. Skeepsborn in Stockholm.

(Source: Hesselgren, 1969, p.222.)

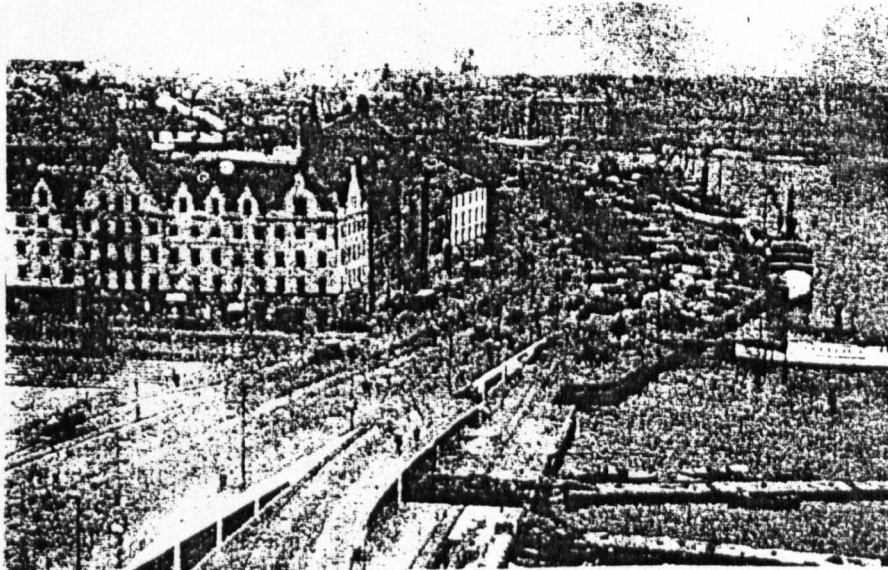


Fig. (3.21). Melancholy and Depression, for when the sun disappears, the environment becomes gloomy, obsolete and lifeless.

(Source: Hesselgren, 1969, p.222.)

Perception of depth can be conceptualised if one as Hesselgren says, can understand the play of light and shadow. As in Arnheim (1974, p.318), it is a remarkable fact about shadows that they can establish space.

Light is an essential part of our life. According to Meyer (1973, p.70), it is considered as a tool which makes us see all the objects around us. Light as Meyer says, is seen in its own right as a means of artistic expression, as in the theatre and cinema. Light can be used effectively inside and outside as in gardens, parks, or in architecture to heighten the value of the object and to draw attention to it. The reflection of different lights as happens in the theatre in order to create a new colour or shade of colours has the same theoretical role as the artist's use of colour.

Use of a contrasted well lit object against a dark background was fully appreciated by artists.¹⁸ Picasso as Lowry (1964, pp36-53) says, was totally conscious of the effect of using contrasted dark and light areas in his paintings. Varied contrasts between light and dark areas have a dynamic effect because they make our eye move about the visual work of art.

Light has different emotional characteristics that should be understood thoroughly by designers, in order to make them able to establish the intended atmosphere in our buildings or in our environment. Buildings vary in their emotional content. A church is different from a factory and a library is different from a bath.



Fig. (3.22). A sense of emphasis. In this painting "Friends" by Hanna Pauli, one can see a dominating focal point that has been achieved by the use of contrasted bright and dark lighting.

(Source: Hesselgren, 1969, p.225.)



Fig. (3.23). An Illusion of Depth. The sensitive use of contrasted bright and light areas has established a noticeable sense of depth.

(Source: Sausmarez, 1980, p.18.)

Different moods of lighting induce different emotional responses from human beings. According to Issac (1971, pp.52-57), a well-lit, bright place might promote a sense of well-being, cheerfulness, exuberance, courtesy; conversely a dimly-lit environment may evoke an atmosphere of expectancy, quietness and mystery.

An environment with little distributed light from the overhead plan may appear oppressive (unless the ceiling is infinitely high); conversely a highly illuminated environment lit from above appears bright. An evenly illuminated environment which lacks variation and the resultant shadow-play will appear monotonous. Conversely, intermittently lit environment may appear dimly illuminated even when the level of illumination is relatively high. A well-lit object in an environment of a low intensity of illumination will become dominant. The use of maximum contrast between light and dark is necessary where the size of the basic theme is relatively small or when its nature is very complex, like jewellery. However, the use of irrational contrast may create a harsh, and tiring environment which lacks subtlety.

If an evenly illuminated object lit from an external source, is located against a dimly lit background it will appear to emit light, to be lit from within, even if the actual source of light is visible. By the appropriate use of lighting, an insignificant object in an environment (lacking possibly position and size) may

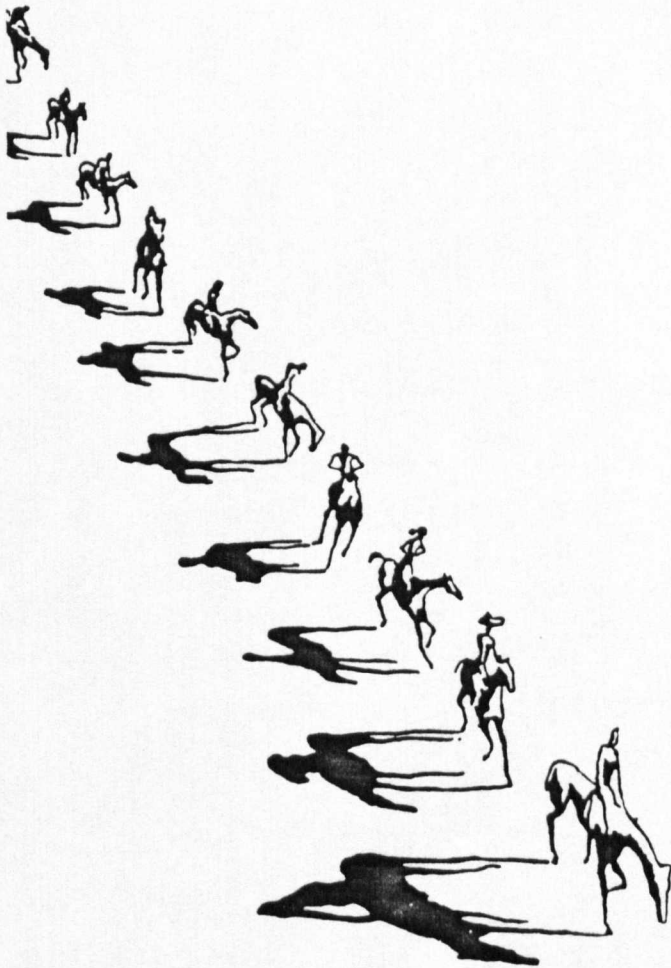


Fig. (3.24). Shadow creates space. The casting shadow of horses on the ground engender a sense of territoriality.

(Source: Arnheim, 1974, p.319.)

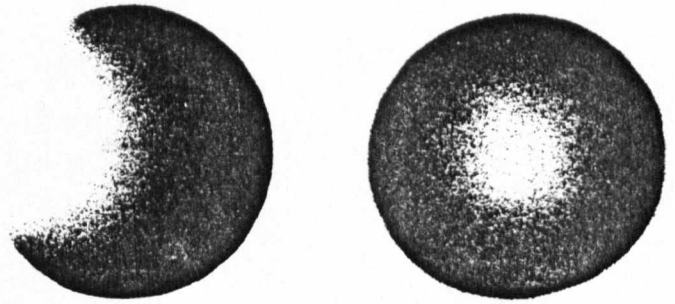
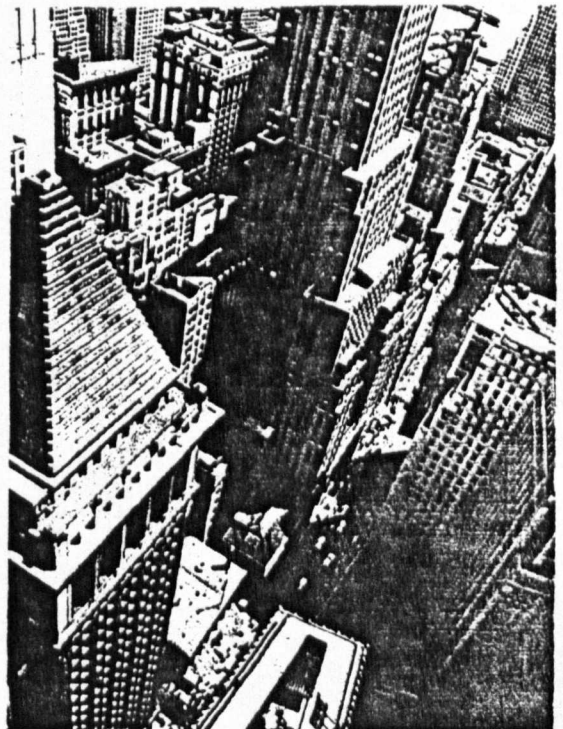


Fig. (3.25). Light and Form Clarity.

(Source: Arnheim, 1974, p.312)

Fig. (3.26). Light, Shadow & Depth. In this illustration the play of light and shadow display the depth of two groups of buildings.

(Source: Lauer, 1985, p.89.)



acquire a special importance and interest. According to Issac, variation in light intensities can be used to assist the position, direction and the spectator's speed through the environment by attracting his attention or by inducing the appropriate degree of curiosity within him. When a special type of lighting is used to highlight a certain function or to induce a certain emotional feeling the functional purpose for this lighting must be seen clearly to justify and dominate the effect, as in the case of a well lit statue placed against a dark background. By developing an object's movement, its background, and the light source or the spectator's movement, an object that was seen in silhouette or in profile at first can be seen in full relief throughout the graduation and the movement sequence of these elements. A sudden appearance of invisible light may be used as Issac says to attract attention. Multiple light sources might be used to establish a degree of pattern, colour, texture and to imply movement. The relationship between the scale of the environment and the size of a light source should be considered carefully. Visible light sources can be used to assist the size control of a large environment as in the instance of locating the intersections with a highly visible source of light. By the use of subtle repetition of light sources a sense of aesthetic rhythm can be established. As in Issac, shadows play an

effective role in projecting the value of the material in use, such as its colour, texture, ornaments, etc. The effect of light changes from natural to artificial upon the environment should be measured precisely, otherwise the spectator's orientation or the focal point of interest might be changed. The use of appropriate lighting can establish, as Issac indicates, a space and apparent total enclosure that it has no physical barriers. The clever use of lighting and sound was fully appreciated by designers, especially in the interpretation field.

3.4 PERCEPTION OF TEXTURE

Different materials vary in their perceptual impact. The reason behind this phenomenon is the variation in texture of the materials used. Every material has its own visual or tactile effect on the sensations that is interpreted by our memory via our previous experience. Photographers, as in Palmer (1972, p.29), use the effect of texture to provoke certain intentional sensations. "The photographs of tactile textures are substitutes for the real thing and serve to remind us of the actual surface." 19

Texture, as in Meyer's definition (1973, p.97), is,

(The) arrangement of threads in texture, fabric, degree of openness or closeness in a surface or

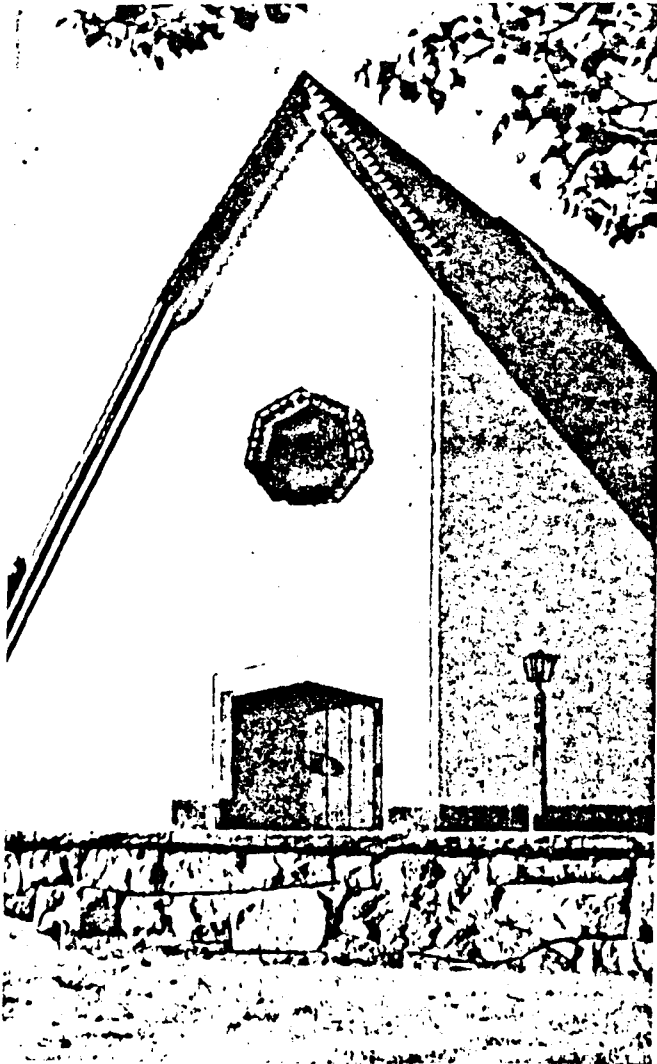


Fig. (3.27). Texture's Language. In this photo we perceive that different materials speak different language. Siri's Chapel. Archites, Carl-Axel Acking and Seven Hesselgren.

(Source: Hesselgren, 1969, p.226.)



Fig. (3.28). Yew Bark. A rubbing textural surface.

(Source: Beaney, 1978, p.39.)

substance when felt or looked at, e.g. cloth, skin, wood; of loose, fine, coarse texture; arrangement of constituent parts, structure, e.g. of skin, rock, literary work; representation of surface of objects in works of art, biology tissue, structure of this, from Latin textura = as text. 20

The character of objects can be sensed differently according to the material used and its texture. According to Meyer, there are materials which can be evaluated texturally by touch and others by vision, and others with both. The best example of visual texture as Meyer indicates, is the sky. The reason for such a phenomenon is that the light of the sky comprises an everchanging pattern, which cannot be sensed by touch. The second way of experiencing textures takes place when we touch things. As in Palmer (1972, p.26), patterns, metal works, jewellery and all other kind of craftsmen's work can be sensed texturally by touch. It is a matter of fact that these things can be appreciated texturally also by vision. Most natural formations have, as Palmer indicates, textural qualities which are either related to structural reasons (e.g. bark) or related to particular function, e.g. the defensive nature of the hedgehog's quills, or the warmth of fur. A remarkable fact about our mechanism of perception, is that a certain tactile sensation of an object can be recalled visually again without the need of touching the same thing again. As an example, the roughness of sacking, the smoothness of glass, the softness of velvet and the hardness of steel, all these tactile sensations can be recalled again

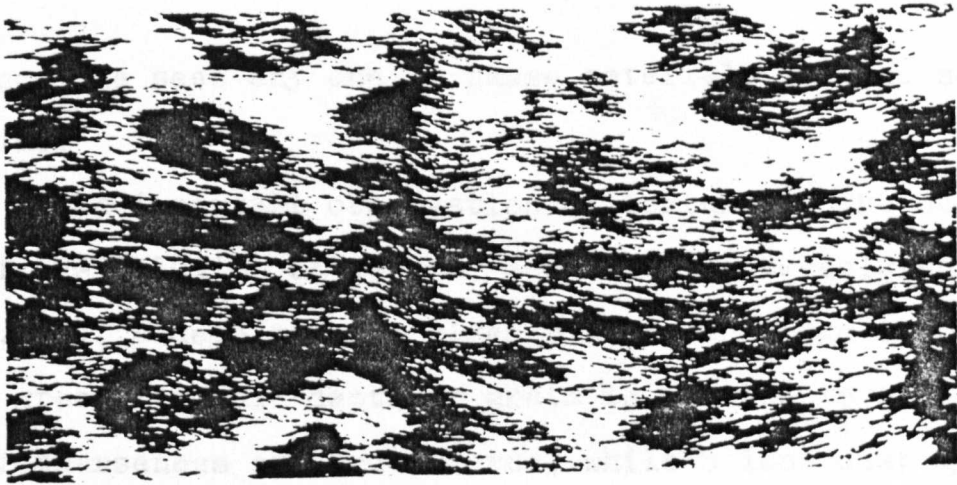


Fig. (3.29). Pattern and Texture. The established pattern of the repeated dark spots in a cheetah pelt creates the given texture.

(Source: Palmer, 1972, p.24.)



Fig. (3.30). Sense of Thickness.



Fig. (3.31). Rugged textural Pattern of an Elephant's skin.

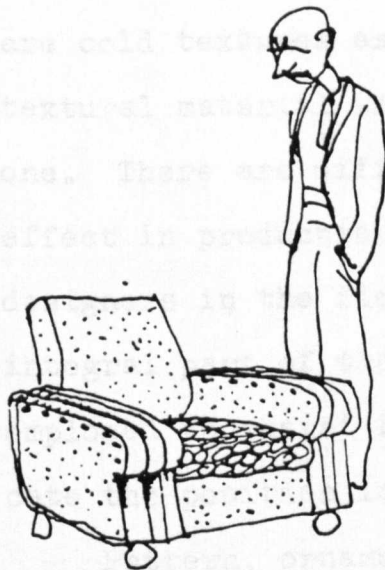
(Source: Beaney, 1973, p.37.)

once one sees any one of these materials for the second time.

An important observation of texture is the occurrence of the illusion of depth. According to Hesselgren (1969, p.311), a deep texture gives rise to an image of grain. A great 'visual' depth in grain is related to a feeling of coarseness and brute force, while a less deep grain as in the case of plaster indicates 'harshness'. An established contrast can be created through the use of combinations of different 'true' depth textures.

There are materials whose visual impact does not correspond with their tactile actuality. Examples of these, as Palmer indicates, are polished wood or cork, marble, printed fabrics and wallpapers. These may be called optical textures.

As in Hesselgren, light plays an important part in presenting the depth of texture in such a clear way. By using the appropriate lighting to illuminate a finely granulated surface, a sense of textural depth will arise. As light casts shadows on relief bodies, an illusion of depth can be established. A sense of unity can be brought to our design through using a dominant texture. According to Smithies, "Dominance may be provided by the effect of one colour; tone or texture being visually stronger than the remainder".²¹ An effect of harmony can be established through using a combination of matching textures.



*A common sin:
smooth leather
and corrugated
cloth on the same
chair. There is
no unity.*

Fig. (3.32). Unity and Texture's Harmony. In this chair the corrugated cloth pattern used is not matching the smooth leather used.

(source: Brochmann, 1955, p.83.)



Fig. (3.33). Section of bark tree. In which one can feel different textural sensations.

(Source: Beaney, 1978, p.41.)

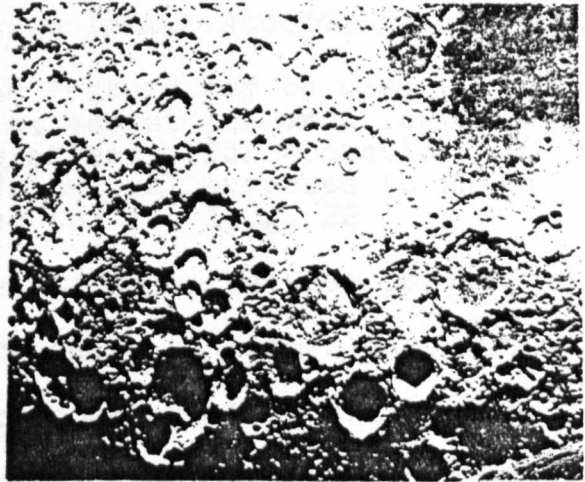


Fig. (3.34). Light & Texture. In which one can sense roughness, contrast and an illusion of depth caused by the lighting variation.

(Source: Anderson, 1961, p.120.)

Textures vary in the perception of their temperature. While there are warm textures, as Hesselgren says, there are cold textures as well. Wool is an example of a warm textural material while marble is an example of a cold one. There are different techniques of using the texture effect in production. According to Meyer (1973, p.104), designers in the field of industry use texture as an integral part of their products. The sense of touch is employed to assist in identifying a product or to indicate the position in which the package can be opened.

Pattern, ornament and texture have a good relation to one another, and their use and their effects in design become mutual between them. According to Issac,

pattern, ornament and texture may be used to control weathering; to assist in camouflaging, for special lighting effects, for acoustic control and so on; functional purposes to which it has been relegated for too long. 22

There is a strong relationship between pattern creation and texture. According to Palmer a confusion may arise between the two terms, pattern and texture. However, there are many occasions when the arrangement of different shapes can create a patterned surface that has a textural quality as well. Also, there are surfaces which have both texture and pattern but in a way that both of them can be distinguished as separate entities.

According to Palmer's definition, pattern as a term means an arrangement of shapes which may be either two



Fig. (3.35). Imitation of Nature. The roughness of this building's surface by Le Corbusier (1957, 60 - La Tourette near Lyon), was his intention to imitate nature.

(Source: Meyer, 1973, p.105.)

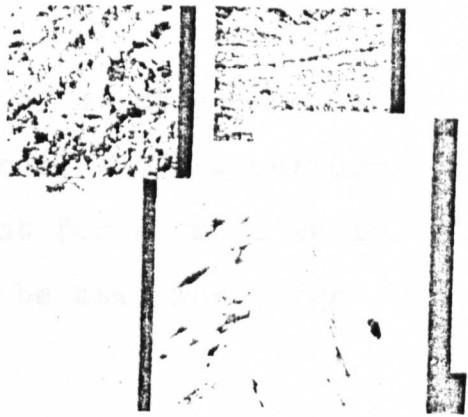
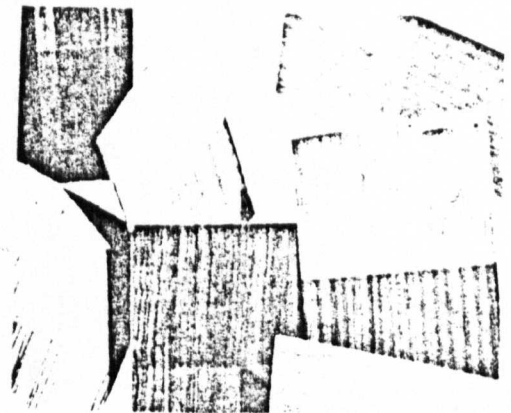


Fig. (3.36) Marble. Cold and smooth texture.

(Source: Hesselgren, 1969, p.201.)

Fig. (3.37). Wood. Warm Texture.

(Source: Hesselgren, 1969, p.201.)



or three dimensional. The size of a pattern has a great influence on the environment. Strong patterns should not be used as a treatment for a small wall, conversely weak ones should not be used for large surfaces.

According to Issac,

Pattern and texture may be employed to maintain small or medium-scale treatment. Areas of enclosure planes, in association with strong patterns, should be generally plain in colour and texture and the size or scale relationship must be carefully considered. Strong, simple or complex patterns may be used to unify a number of separate and dissimilar elements. 23

3.5 PERCEPTION OF RHYTHM

Rhythm (Meyer, 1973, p.139), is created when objects are seen or arranged in such an isolated or related way. As in any design product, rhythm is used in Architecture to provide an 'eye-catcher' by which the organisation of the architectural elements can be perceived easily.²⁴

Rhythm (Hesselgren, 1969 p.158), determines the melody of a composition as a whole. "Rhythm and tone intervals form part of the higher whole, the melody, in a way characteristic of all the distinctive features of the formation of Gestalt."²⁵ Klage's definition of rhythm (Hesselgren, 1969 p.159), "is primarily something that flows, a happening that without interruptions gradually changes between two extremes".²⁶

Rhythm has a high perceptual connotation. According to Woodrow's definition (Hesselgren, 1969 p.158), it is described as "the perception of a series of stimuli in such a way that a series of groups is perceived".²⁷

By a skillful organisation of rhythmic elements a sense of motion can be created. As in Hesselgren (1969 p.159), while rhythm extends in time, perception of motion becomes an important part of its experience. As in Lauer (1985, p.114), "just as in music, some visual rhythm can be legato, or connecting and flowing; others are staccato, or abrupt and dynamic".²⁸

Building an expectation is a unique characteristic of rhythm; if it happened to be destroyed, a sense of disappointment will be felt.²⁹

An aspect of complex rhythm would be very difficult to be perceived. According to Bacon, the complex inter-relationship of the multiple rhythms which have been set up by the bays and openings in the Baroque Architecture are difficultly handled by the mind and cause tiredness and strain for the observer's eye.³⁰

Rhythm has common abstract qualities which are of special interest in the process of perception. As in Meyer, these qualities are: direction, sequence, interval, separation, tension, anticipation, surprise and revelation, harmony and contrast and graduation.

The perception of rhythm has physiological implications. According to Smith (1979, p.24), "The human mind possesses an intrinsic tendency to group random phenomena into rhythmic patterns", and the appreciation of these rhythms "range from the limbic satisfaction with heavy serial rhythm or beat, to the more sophisticated and subtle rhythms discerned by the cerebral cortex, particularly its minor hemisphere".³²

Rhythm has been used widely in art. Architecture which lays some claim to being the mother art, enables us to see, feel and experience rhythm and space in such a clear way. As Smith indicates, Medieval and Renaissance builders were expert in using numerous rhythms of

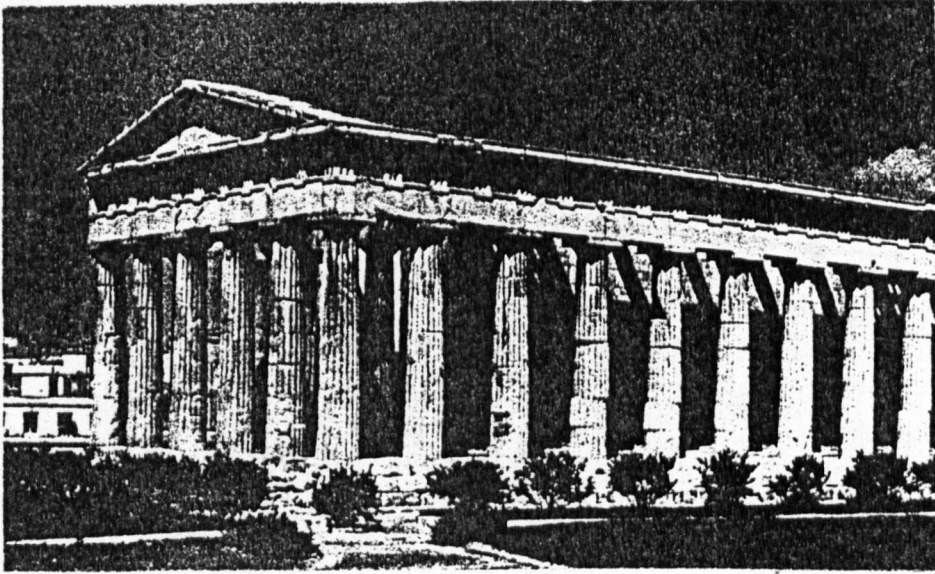


Fig. (3.38). Rhythm and light. The alternation of light on columns and the shadow between them have established a powerful pattern of rhythm.

(Source: Laure, 1985, p.116.)



Fig. (3.39). Tactile rhythm. Texture can establish rhythm in which a pattern of repetitive knops or colourful spots can exist.

(Source: Laure, 1985, p.116.)

different frequency both in and outside the building.³³

Rhythm plays an important part in architecture through its contribution to the whole aesthetic impact of the building.

As rhythm helps in the organisation and the management of data, it is undoubtedly considered as a source of satisfaction. From the perception viewpoint, rhythm as Smith indicates, assists both memory, storage and recall.

Rhythm has two different forms. As in Hesselgren (1969 p.160), either it is a bound rhythm in which the time is kept or it is free rhythm in which the tone intervals are varied. A good example of bound rhythm can be seen in a marching regiment of soldiers. The free rhythm which is so called by the "artistic" rhythm, as can be well seen in dancing. Over history, western music has changed in its usage of rhythm many times. The choice between free rhythm and bound rhythm invariably took place.

Colour (Meyer, 1973, p.87), plays a magnificent part in creating rhythm. In modern architecture, colour has been used to build rhythm in buildings to replace the use of ornament in the classical architecture. Among the names of architects who have used colour to create rhythm are Gropious, Rietveld, Van Doesburg, Mies van der Rohe and le Corbusier, By blending areas of pure colour into architectural rhythm and structure,

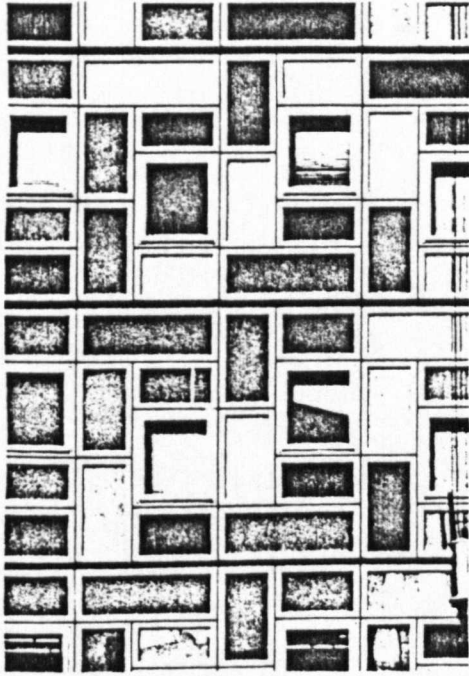
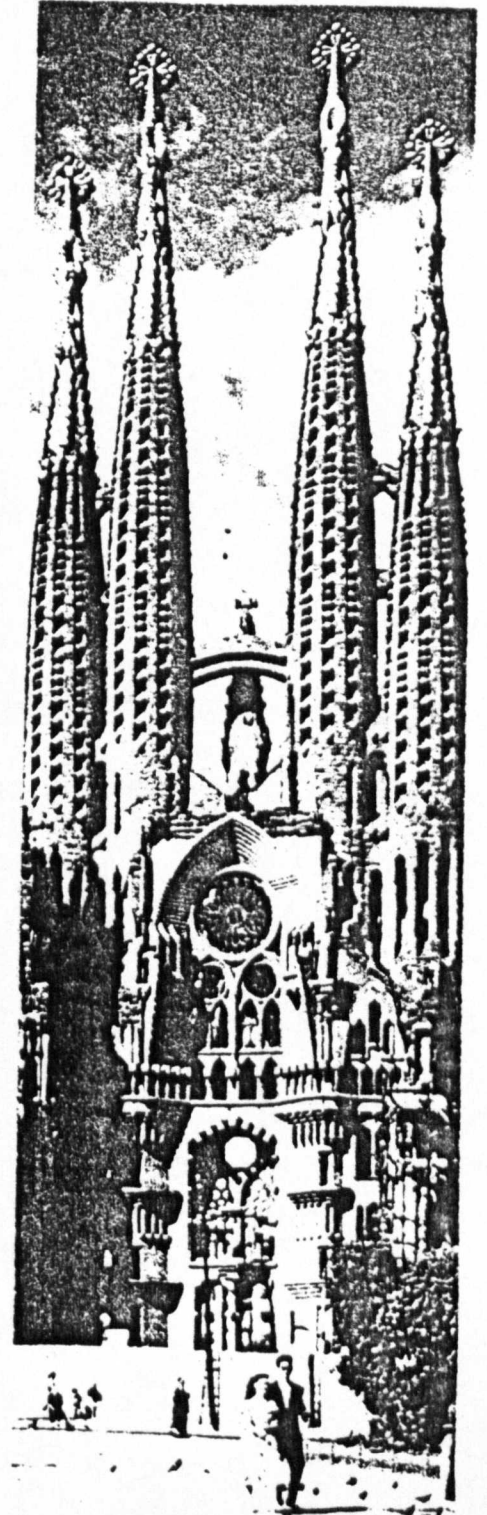


Fig. (3.40). Colour and Rhythm, in which different patterns of different repeated colourful units have established rhythmic mood.

(Source: Meyer, 1973, p.141.)

Fig. (3.41). Rhythm and Contrast. The contrasted and repeated elements in the structure of La Sagrada Familia in Barcelona have established a powerful unified rhythm.

(Source: Meyer, 1975, p.137.)



those pioneers, as Meyer indicates, have archived harmony, surprise and unity.

3.6 PERCEPTION OF PROPORTION

Across history proportion as a configurational principle in art and architecture has taken a special interest from architects and mathematicians.

The need for establishing a system of proportion has arisen from the urge to standardise our products and from the need to satisfy an aesthetical and innate humanitarian requirements.³⁴

By using a proportional system, a state of totality, whole and life can be established. According to Smithies (1981, pp.17-16), the repetition of a single or a series of related three dimensional proportional forms can establish an underlying unity, if the way in which these forms have been arranged were handled skillfully, otherwise monotony may arise.

Throughout history, artists and mathematicians have done their best to establish an adequate proportional system. According to Meyer (1973, p.61), the golden section as a proportional system can be found in classical architecture, also in works of the Romanesque and the Italian Renaissance periods, where it was used to articulate areas and to organise composition, intervals and rhythm. Greek design, as Smithies (1981, p.11), says,



fig. (3.42). The System of Proportion in Greek Architecture.

(Source: Issac, 1971, p.85.)

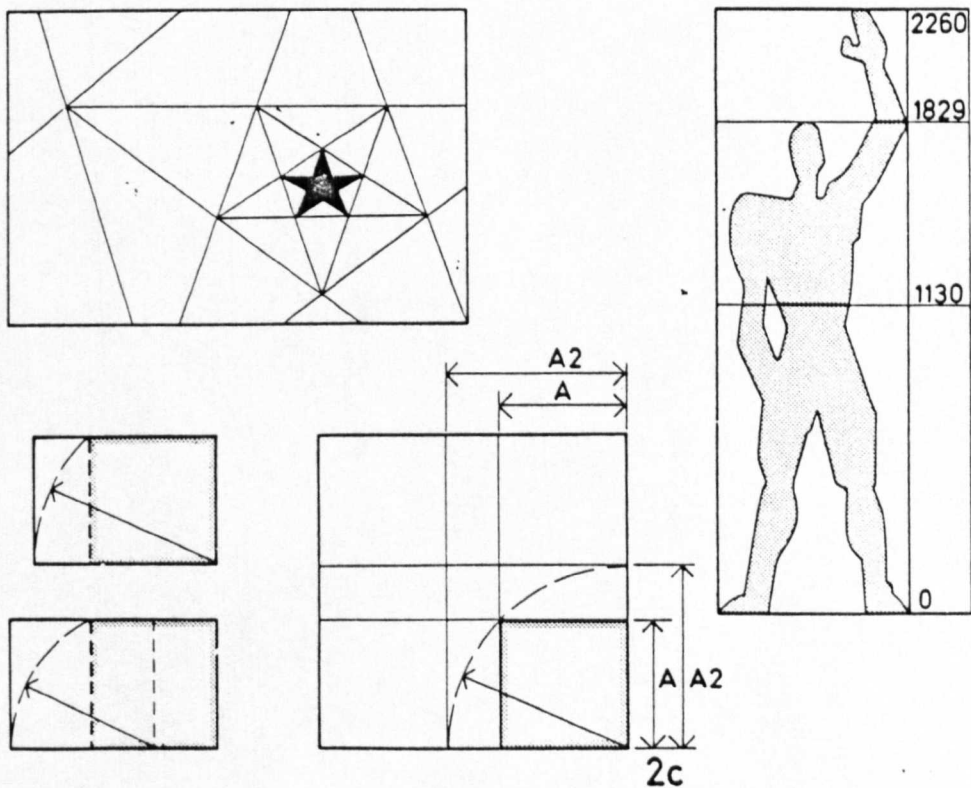


fig. (3.43) The proportions of the human body being and the golden section.

(Source: Issac, 1971, p.84)

Was strongly influenced by a concern for harmoniously modulated composition. The harmonic relationship of part to the whole was based upon a proportional system, the best known being the Golden Section or divine proportion. This is $(\sqrt{5}+1)/2$ or 1:1.618; this ratio provides a very wide choice of combinations..... As a series (0.618:1:1.618:1.618²:1.618³:1.618) it has property as a Fibonacci series (each number being the sum of the two numbers preceding) e.g. 2:4:6:10 etc. 35

According to Kepes (1966p.35), the pre-Socratic concept of a man as the measure of everything, expressed a general feeling which later became basic in classical times. During Greek times, many architects, as in Issac (1971, p.102), showed a high skill in applying the classical proportional system which was known at that time. Leonardo Da Vinci's works and those of Palladio are in the forefront to be mentioned (based on proportions of 1: $\sqrt{2}$ and 1:2 double square).

While looking for a new proportional system the artists and architects of the new architectural movement were reluctantly using the classical and the romantic discipline. As in Crosby(1965, p.9),

The artists and architects of the nineteenth and twentieth century were not ignorant of the theories (classical and romantic theories) but as they could not share their sixteenth-century religious and philosophic basis, the theories seemed to them irrelevant. However, they continued to use the systems while looking about for a new theoretical basis. 36

Proportion as a principle in architecture has a perceptual connotation. According to Kepes (1966, p.218),

The sense of proportion is inherent in the experience of perception and like all other perceptual properties it is dynamic: rightness presents itself not as a dead immobility but as the active equipoise of concerted forces while wrongness is seen as a struggle

to get away from an unsatisfactory state.³⁷

Physiologically it was assumed, as in Kepes (1966, p.219), that an optical pattern when projected upon the relevant cortical field of forces in the brain produces there a corresponding configuration of forces. Accordingly we sense pleasure if the three dimensional relationship of the projected pattern is harmonious. Conversely, we feel misery if this relation is awkward. Gestalt psychologists, as in Smith (1979, p.20-23), believe that an object of good configuration involves three dimensional patterns of excitation in the brain. This fact makes us understand that the excitation can take place if the three dimensional object is designed to be pertinent to neuronal patterns of the brain.

Since the time of realising man to the direct connection between the well proportioned thing and the excitation of the brain, he did, as Smith indicates, his best to contrive a numerical series to help him in designing his products and to avoid the uncertainty of measures.

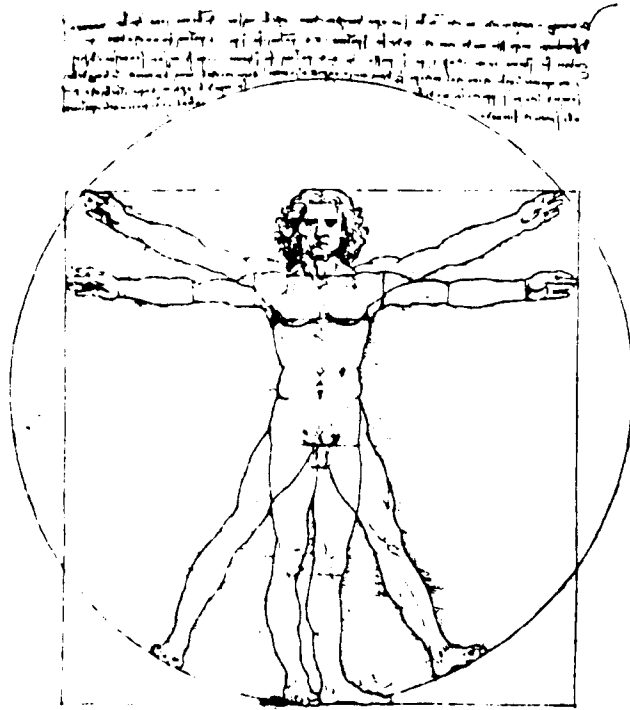
As a result of this discovery, man started to look at nature being the source of logic. For Issac (1971, p.101), the Greek's mathematical and proportional system was difficult in its consideration of the human physical scale; conversely Le Corbusier's modular system did not ignore it. The later invention of Le Corbusier's modular system that is based upon the Golden Section was behind

Le Corbusier's belief that this ratio has a cosmic connotation. As in Kepes (1966, p.223), Le Corbusier's preference for the Golden Section was because it has a cosmic connotation, being the formula of life, which has been discovered by scientists in the body structure of plant and animal. This ratio, being applied in man's artifacts and products makes the cosmos law easy to be read from that of microcosm.

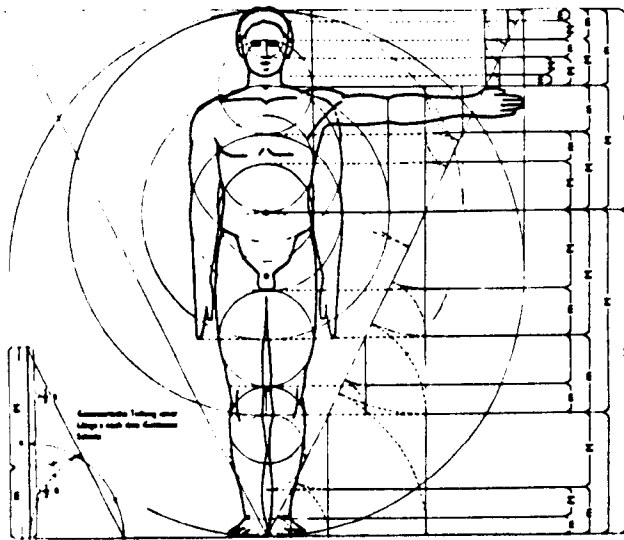
It is known that Le Corbusier has established his modular system in the human body, and having done that he extended, as Meyer says, a link with the ideas of Renaissance artists such as Leonardo and Durer.

The Golden Section in which its two dimensions: the longer and the smaller respectively, yields as in Kepes (1966, p.218), a ratio of roughly 8:5. This ratio combines unbreakable unity with lively tension, compared with a ratio of 2:1 in which one can experience a visual diversion.

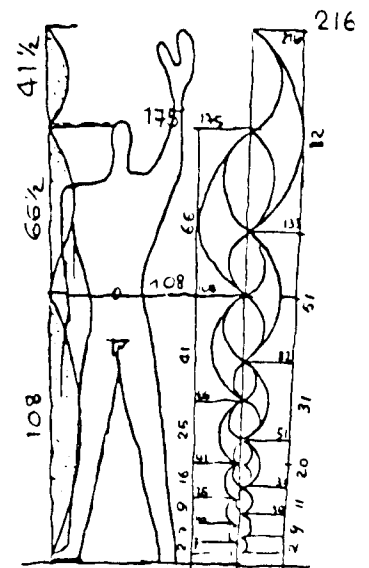
There is no compulsion to use the Golden Section, since artists are required to use their intuition to judge their work. Le Corbusier indicates, as in Kepes (1966, p.223), that the arithmetic progression values of the modular system do not guarantee continuity; they only suggest it. Since it is left for the artist to pick up from the scale the values he wishes to combine, he must therefore use his intuition to judge the values he uses. Hence "the Golden mean and other geometrical



Leonardo da Vinci's scheme of the proportions of the human body.



The proportions of the human body by Zeising.



The System of Proportion by Le Corbusier

fig (3.44) The Human being and the system of proportions

(Source: Meyer, 1973, p.66).

means cannot replace the creative mind nor take over the artist's work but only support it".³⁸

The practice of centuries has shown, as in Le Corbusier (1958, p.21), that the Golden mean is the most pleasing of such relationships. Being applied in architecture it draws it to the cosmic law which is best exemplified in the human's body proportion.

The principle of Cubism as Meyer indicates, has a strong connection with the Golden section theory. The pioneers of this movement as was indicated have borrowed the idea of the Golden section from Leonardo's theories.

The modular system was successfully used to meet the demand for prefabrication units and many other mass products. A clear example of its application by Le Corbusier can be seen in the Unite d'Marselles in 1945.

It was accepted that there is a relation between sight and sound. As in Anand, "the basic problems of sound, pitch and quality were studied in connection with the drum instruments....and the tones were analysed. The result shows awareness of the intimate connection between sight and sound". Hence, one can imagine that there must be a relationship between the proportional visual systems and the audible one that exists in music.

CHAPTER 3 NOTES AND REFERENCES

1. Lewis, David, Urban Structure (Elek Books, 1968), p.225.
2. Schulz, Norberg, Intension in Architecture (Universitesforlaget. Allen & Unwin Ltd. 1963), p.34.
3. Smithies, K.W., Principles of Design in Architecture (Van Nostrand Reinhold, 1981), p.6.
4. Hesselgren, Sven, The Language of Architecture (Student Literature-Lund Sweden, 1969), pp.204-5.
5. Issac, A.R.G., Approach to Architectural Design (London Iliffe Books - Butterworth Group Ltd. 1971), p.95.
6. Simonds, John, Landscape Architecture (Iliffe Books Ltd., London, 1961), p.23.
7. Smith, Peter F., Architecture & The Human Dimension (George Godwin Ltd., 1979), p.13.
8. Lewis, David, ibid., 1968, p.226.
9. Ibid., p.228.
10. Smith, Peter F., ibid., 1979, p.15.
11. Arnheim, Rodolf., Art & Visual Perception. A Psychology of the Creative Eye. (University of California Press, 1974), p.368.
12. Meyer, de Lucie Visual Aesthetics (Lund Humphries London, 1973) p.89.
13. Issac, A.R.G., ibid., 1971, p.44 and You Can Read Also, Harald Kueppers, The Basic Law of Colour Theory (Barron's, U.S.A. 1982), pp.101-16.
14. Hesselgren, Sven, ibid., 1969, p.284.
15. Ibid., p.223
16. Arnheim, Rudolf, ibid., 1974, p.303 and You Can Read Also, M.H. Pirenne Optics, Painting & Photography (Cambridge University Press, 1970), p.13-14.
17. Hesselgren, Sven, ibid., 1969, p.309.
18. Ibid., p.332 and You Can See Also, Pates Lowry, The Visual Experience An Introduction to Art (Prentice-Hall, 1964), pp.36-53.

19. Palmer, Fredrick, Visual Awareness, (B.T. Batsford Limited, London 1972), p.29.
20. Meyer, de Lucio, 1973, p.99.
21. Smithies, K.W., *ibid.*, 1981, p.10.
22. Issac, A.R.G., *ibid.*, 1971, p.100.
23. *Ibid.*, p.101.
24. Meyer, J.J. de Luccio, Visual Aesthetic (Lund Humphries, London, 1973), p.137.
25. Hesselgren, Sven, The Language of Architecture, (Iliffe Books Ltd., London 1969), p.158.
26. *Ibid.*, p.159
27. *Ibid.*, p.158.
28. Lauer, David A., Design Basics, (Hold, Rinehart & Winston, 1985,) p. 114.
29. Simonds, John, *ibid.*, 1961, p.134.
30. Bacon, Edmund, Design of Cities, (Thames & Hudson, London, 1967), p.184.
31. Smith, Peter F. Architecture & Human Dimension, (Godwin Limited, 1979), p.24.
32. *Ibid.*, p.25.
33. *Ibid.*
34. Kepes, Gyorgy, Module Symmetry Proportion, (Studio-Vista, London, 1966), pp.218-28. "This quotation is taken from an essay published by Rudolf Arnheim in 1966 under the title of A Review of Proportion."
35. Smithies, K.W., Principles of Design in Architecture (Van Nostrand Reinhold Company, 1981), p.11 and You Can See, Issac, A.R.G., Approach to Architectural Design, (Iliffe, London, 1971), p.84, and Kepes, Georgy, *ibid.*, 1966, p.221, and Meyer de Lucio, *ibid.*, 1973, p.64.
36. Crosby, Theo., City Sense, (Studio Vista, London, 1965,) p.9.
37. Kepes, Gyorgy , *ibid.*, 1966, p.218.
38. Meyer, De Lucio, *ibid.*, p.64.

- 39 Le Corbusier, Modulor 2 (Faber and Faber Limited, 1958), p.21.
- 40 Anand, Mulk, Seven Little Known Birds of the Inner Eye, (Charles E. Tuttle Company, Tokyo, Japan, 1978), p.42 and You Can Read, Smith, *ibid.*, 1979), pp.20-3.

CHAPTER 4: THE DYNAMICS OF ARCHITECTURE

4.1 THE DYNAMICS OF LINES

It is argued that lines vary in their abstract qualities and their emotional characteristics. Hence it is necessary for architects to understand the dynamics and the potential energy of lines, and their perceptual impact upon the human responses.

Man (Anand, 1978, p.47), is charged with dynamic energies. "(These) dynamic energies...require corresponding expressionist movements in his creations to stimulate him to his purposive goal-seeking." ¹ Lines as design equipment can bring forth these expressionist movements to man's creations to stimulate him and to satisfy his emotional needs.

Lines, as any other phenomena, have had a great impact on human sensations. Simonds comments on that meaning saying: "Lines, forms, texture, sounds, and colors all have certain predictable impacts on the human intellectual-emotional responses". ²

The straight line as it was described by Meyer varies only in length and therefore is least ornamental. If a straight line joined by other curved one, he will acquire an ornamental taste. ³ The straight line as Issac identified it is the line of uncompromised direct movement. ⁴ In a psychological experiment it was proved

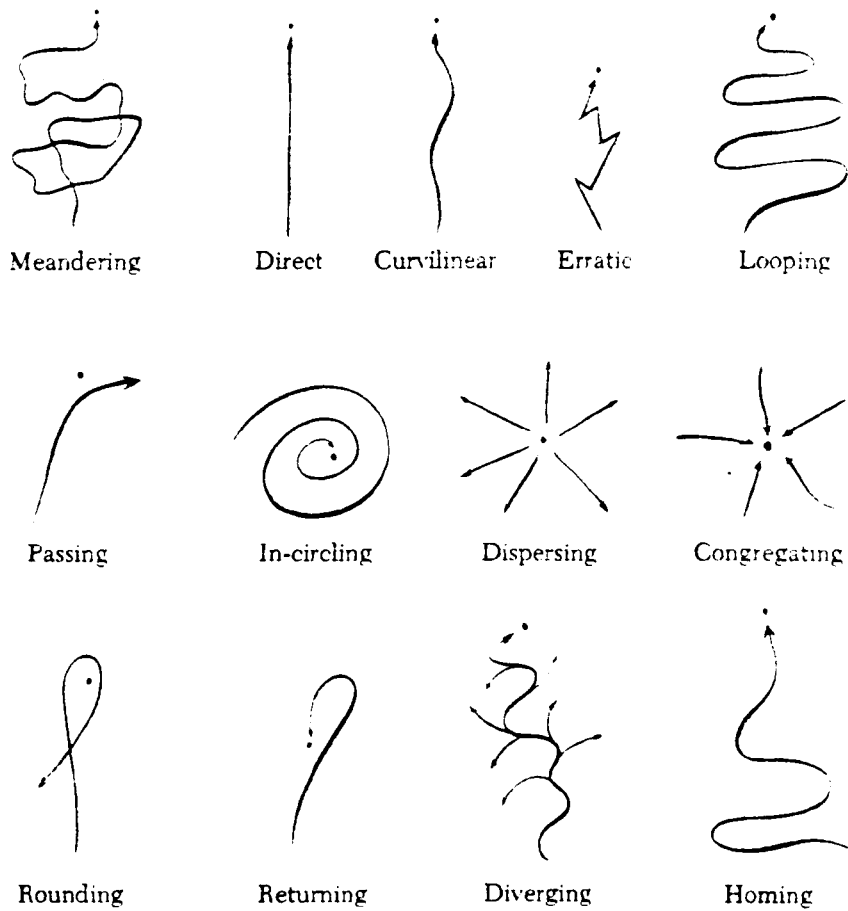


Fig. (4.1). Line of access in which different mood of different lines shows different abstract qualities.

(Source: Simmonds, 1961, p.146.)

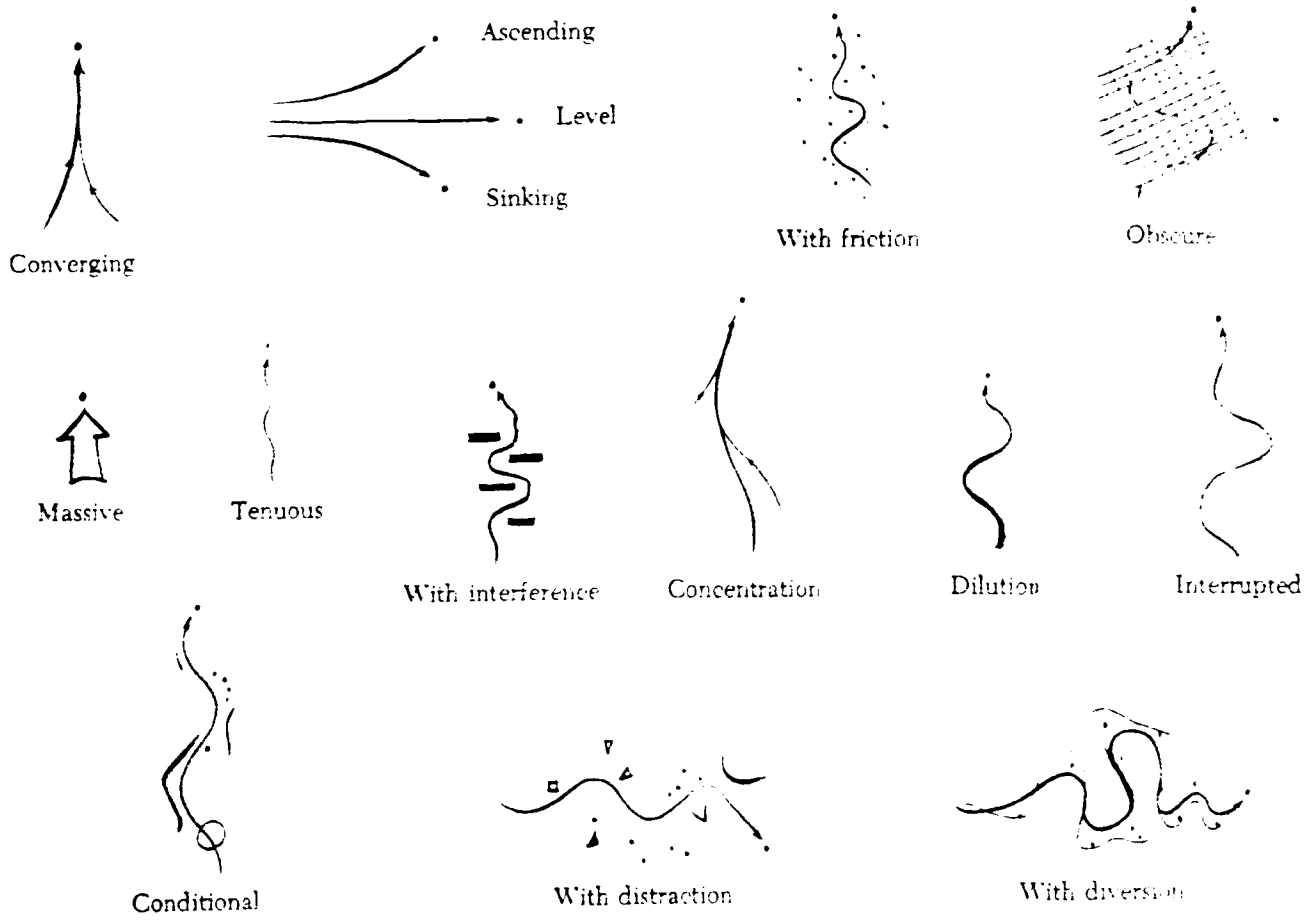


Fig. (4.2). Line of movement, which shows different aspects of expressions.

(Source: Simonds , 1961, p.147)

that we find a greater pleasure in looking at curves than in looking at straight lines. It is a matter of physiological interpretation, where the three pairs of muscles which control our eyes' movements are not arranged symmetrically.⁵

Lies Van Der Rohe's 'Guiding Wall' concept which could be seen in his pavilion in Barcelona has depended on the straight line potentiality.⁶

The curved line as Issac described it, is the line which, contrary to its colleagues, flows softly; smoothly; and has a feminine expression. According to Meyer the curved line is more ornamental than any other line. The curved line emerging from a central point has a potentiality of creating forms of containment quality.

The diagonal line is the most energetic line, being associated with specific life aspects of dynamic properties such as mountain climbing, travelling up or down a hill, or the crescendos and diminuendos in music.

The diagonal line (Meyer, 1973, p.20), is often employed whenever we search for visual excitement and sensation. During walking we shift our legs in such a diagonal way. Diagonal movement is often related to rotating movement, which is the basis of all other movements.

Most elements of architecture and landscape are based on the vertical and the horizontal directions which conform to the human being's elementary energies. Man

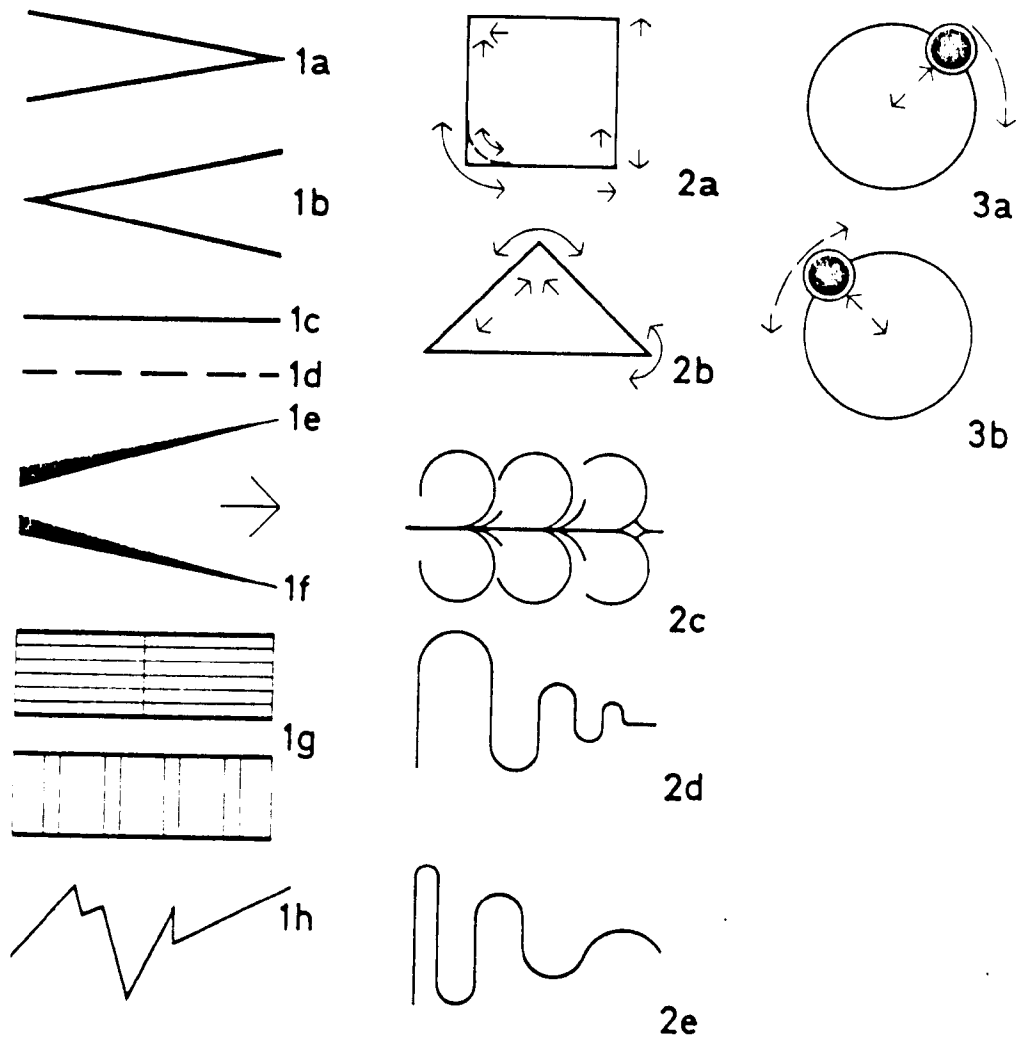


Fig. (4.3). THE IDENTITY OF LINES.

1a - 1h shows in general left-to-right movement varying in speed.

2a - 2e show change of direction and size sequence.

In 3a and 3b one can experience movement in right and left hand side relatively.

(Source: Issac, 1971, p.38.)

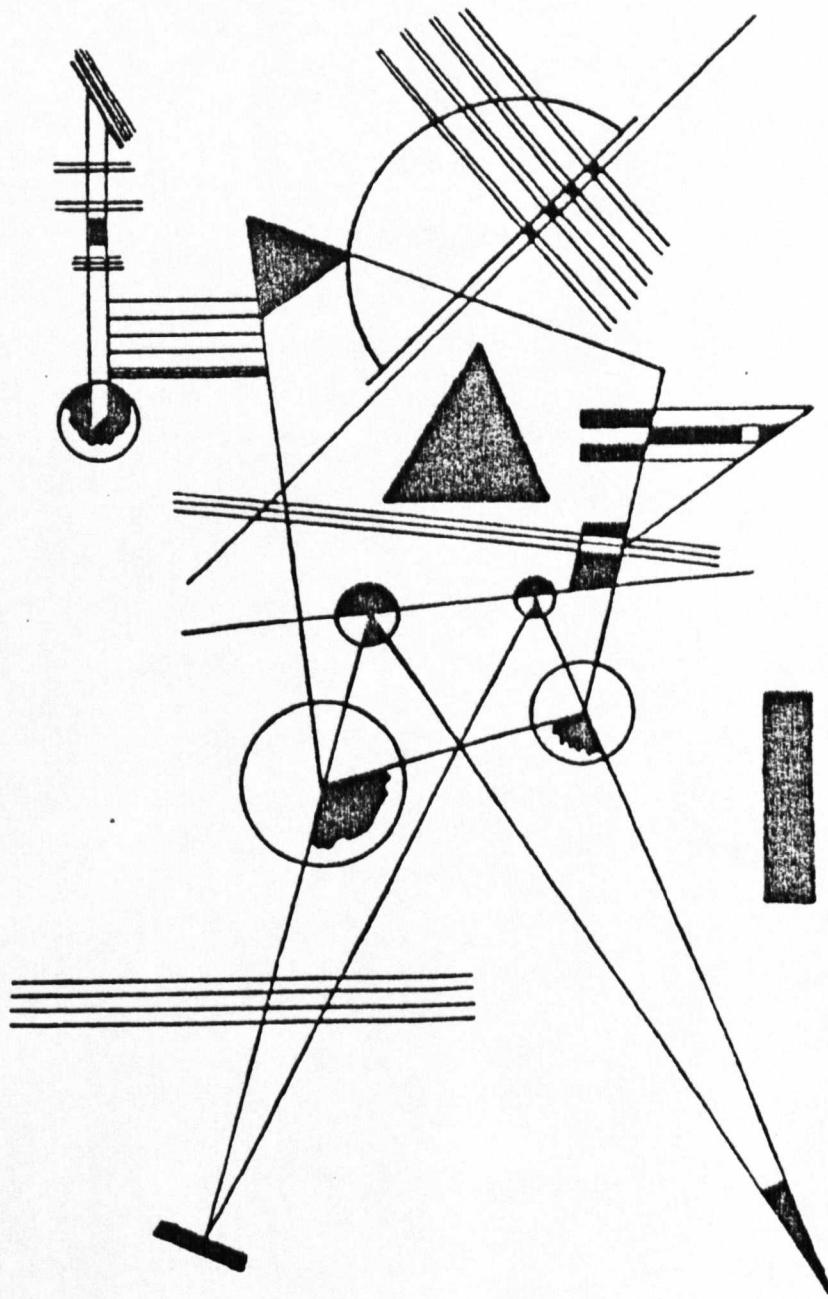


Fig. (4.4). The Dynamics of lines. One can sense different abstract qualities in Kandinsky's plate lines such as movement, speed, and direction.

(Source: Kandinsky, 1979, p.170)

stands up whenever he decides to act and he lies down whenever he seeks rest.

According to our previous experience Anand says that "(Man) sums up the work of art before him in such terms as 'soothing' or 'linear' or 'affecting' or in intellectual terms. He is thus seeking 'vitality' in a triangle or in upward thrust, 'coherence' in a curved line, or 'rest' in a cube or rectangle".⁷

Finally, I would like to emphasise that it is important for artists generally and for architects specifically to try to understand the abstract qualities of the lines they are using, otherwise their design will achieve only chaotic forms. Simonds in the following quotation shows us how important it is for designers to study the dynamics of lines.

"Where the containing elements of a space have linear characteristics, the abstract line qualities are of great design importance. Every line evident in the form or surface of any element, or described by the meeting of any forms or planes, has its own abstract design expression. This expression must be in harmony with the intended nature of the space. 8

4.2 THE DYNAMICS OF FORMS

Studying the dynamics of form is of a great importance for architects and artists in general. Forms and shapes contain within their constitutional bodies some quantum of potential energy on which their expressions depended.⁹

The word 'form' (as in Whyte, 1968, p.8),

refers to the shapes of material objects, the arrangement in space of groups of them, and the arrangement in space of their component parts. Our appreciation of form is partly sensory, but we can be helped by measurement and calculation to gain some confidence that what we perceive is not entirely unconnected with the outside world. 10

An alternative term for the word 'form' is the word 'structure' which in its basic sense (as in Kepes, 1965, introduction), "is the created unity of parts and joints of entities. It is a pattern of dynamic cohesion in which noun and verb, 'form' and to 'form', are coexistent and interchangeable; of interacting forces perceived as a single spatio-temporal entity".¹¹

Perceiving the form varies from one person to another. As in Whyte (1968, p.6), Arnheim says that the 'aesthetic significance' of a particular form depends not only on its virtual shape and structure, but also on the formative process of perception, the personal attitudes and reactions of the percipient, and on his culture.

Natural laws have a deep effect on creation of form as in Simonds (1961, p.11),

Every process in nature has its necessary form. These processes always result in functional forms. They follow the law of the shortest distance between points: motion creates for itself forms of movement. For each energy there is a form of energy. 12

The laws of least resistance, and of economy, and of effort make it inevitable that similar actions should produce similar forms. Arnheim in that meaning adds that, "sameness of role expresses itself in sameness of

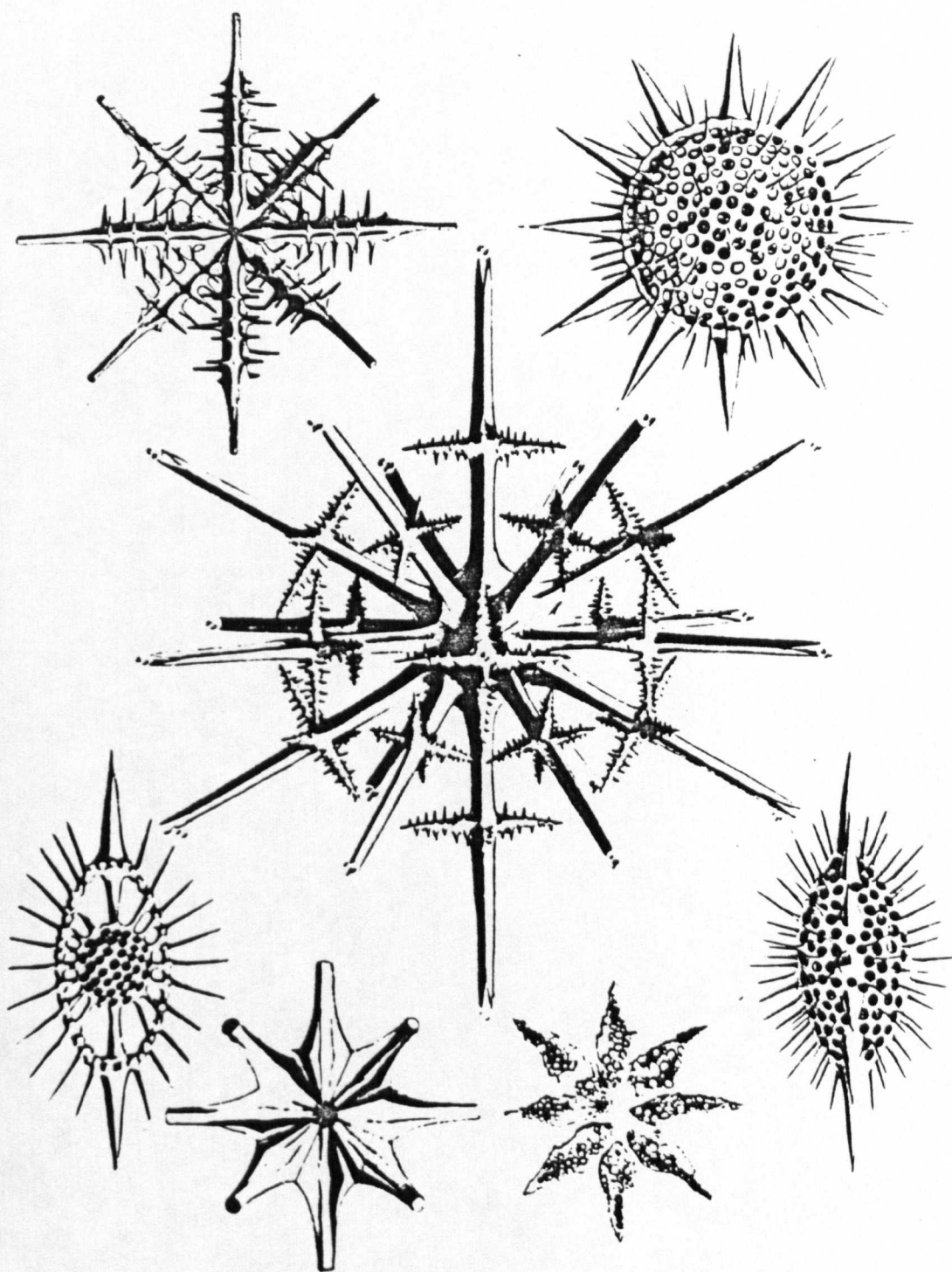


Fig. (4.5). Nature and creation, in which one sees different forms of self entity.

(Source: Kepes, 1966, p.87.)

appearance".¹³

The problems of form (as in Schulz, 1963, p.132), are of great importance to the architect, because they concern the means which are his own special interest in the process of design.

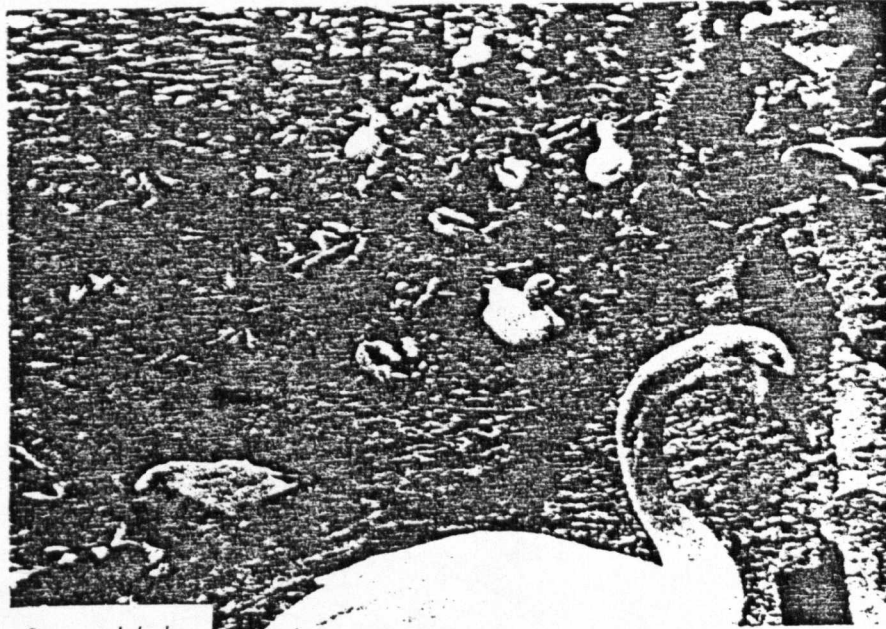
It is acknowledged that there are two basic modes of forms. The first is simple, the second is complex, being combined of different basic forms.

The first mode of forms has a kind of self unity. According to Smithies(1981,p.9), "A simple object such as a sphere or an egg is an obvious entity having self-unity".¹⁴ Nature in favour of producing forms of self-unity like flowers, crystals and atoms.

Similar forms have a tendency to be grouped together. As in Palmer (1972, p.46),

In the world around us, we see many examples of natural groups. There are those which are formed for structural and functional purposes and there are those groups which are created by similarity or a desire for security. We ourselves, catalogue animals and plants according to their species, and then make further breakdowns in terms of such things as family, social behaviour, colour, markings, environment and habits. ¹⁵

A distortion may affect forms of self entity. In that situation the case can be described as a 'deviation from the norm'. As in Hesselgren (1969, p.79), a little deviation from a 'pregnant' perception can be grasped more easily than one from a non-pregnant one. As in Schulz (1963, p.136), also a deviation from the symmetrical or regular form has to be very clear to be formally active.



Swan and ducks



Family group

Fig. (4.6). Aspect of Gestalt form. In which we can see how a 'whole' can be created through a repetition of the same species.

(Source: Palmer, 1972, p.47.)

The second mode of form is of great importance to architects, where architecture always uses different combined forms which is characteristic of that mode. The organic form can be classified here under this category, while that mode of form is a combination of varied elements. Therefore it is inevitable for these elements to avoid conflicting each other and to unify in such a homogeneous balanced form.¹⁶

Gestalt psychologists have moved far in their research to examine the human ability to perceive forms. They confirmed that we tend to perceive things as a 'whole', not as 'particles'. Also, they have investigated the relationships between the parts and the whole.

The organic form is a mode of combined similar or different forms. The honeycomb is an organic form made of similar cells. The human form is an organic form made of different shaped organs. The organic form is the most unified form within other forms. A building can be designed in such an organic way to represent a 'whole' or a gestalt such as the Greek temple.¹⁷

Function has undeniable influence on form. We all know the famous clause of Le Corbusier which says that, 'form follows function'. However, it is argued that function cannot influence form in the whole situation where there are occasions in which the function is of abstract qualities, which it is not easy for the form to express or to pronounce it as in the case of a library. How

can its form follow the reaction of reading?"¹⁸ The answer, as in Arnheim (1977, p.256), is that, "physical function does not sufficiently determine form and no such determination explains why a visible kinship should result between function and expression".¹⁹ It has been proved by now that neither in biology nor in the applied arts can form ever fully be determined by function.²⁰

It was argued that every form is charged with the action of a certain amount of energy. As in Grillo (1960, p.173), the association of mass and motion produces the equation of energy.²¹ The world around us is made of forces in equilibrium - or energy in its potential form - and forces in motion or kinetic energy.

4.3 THE DYNAMICS OF DIRECTIONS

4.3.a The Horizontal Directions

It was argued that the horizontal direction is the most convenient of all directions.

Mathematitians as in Grillo (1975, p.208), have investigated the principle of least action. Descarts, Maupertuis, Lagrange, Hamilton, etc., have done their best to formulate the important principle, better known to us as the very human 'law of least effort', which controls the whole theory of circulation in design. In their discovery it appeared that the horizontal circulation, is much more convenient than any other circulation, and it consumes the human being's least energy.



Fig. (4.7). Seascape and horizontality, in which one can be able to accept the fact of nature being the source of horizontality; the phenomenon which has been acknowledged earlier as the main direction of life.

(Source: Simonds, 1961, p.15.)

The Chinese (Grillo, 1975, p.208), who are known as being first in wisdom, built most of their cities no more than one story high. Such buildings convey a restful feeling of peace, and easy going living.

As in Meyer (1973, p.20), "the basic activity of ordinary man is essentially vertical and horizontal".²²

Frank Lloyd Wright believed that the horizontal direction is the canonic and the main direction in our universe. Arnheim comments on Wright's buildings, saying "Distinctly horizontal buildings, such as some of Wright's prairie houses give the impression of lying on the ground like a reclining animal".²³

According to Arnheim's philosophy, (Arnheim 1977, p.44), horizontal buildings are connected to the ground by parallelism and not by penetration as in the case of vertical and tall buildings. The horizontal direction as Schulz says, is an interpretation of man's concrete world of action.

Things of horizontality like god created landscape or man made forms are characterised by stability, repose, and equilibrium.²⁴

A composition of horizontal and vertical patterns, inevitably would have a great deal of vitality. The resulting contrast achieved by using the two directions at one time should enliven the composition. Absolute horizontality should be avoided otherwise it will lead to monotony. As in Simonds (1961, p.65), our structure

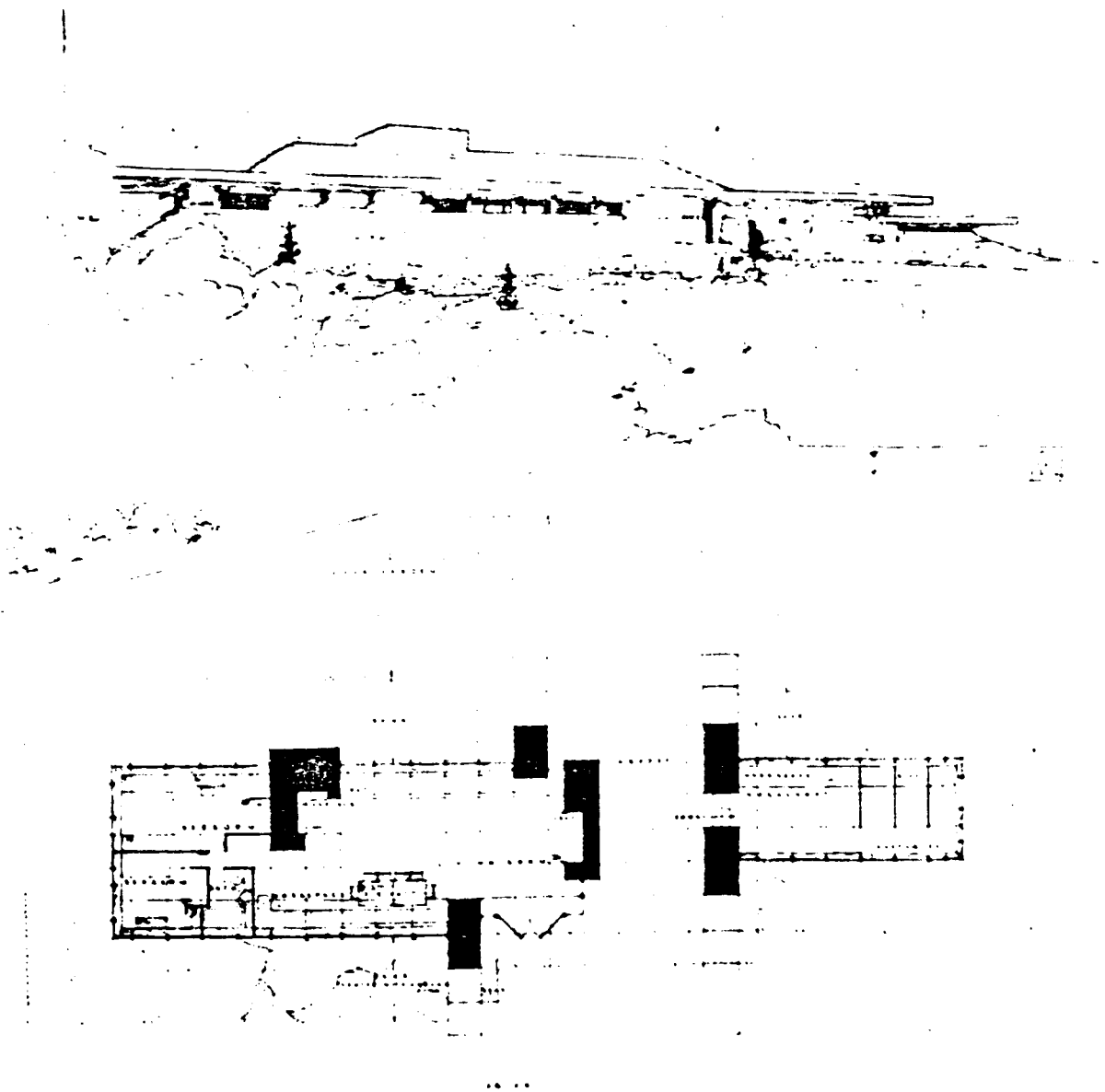


Fig. (4.8). Berm Houses (Frank Lloyd Wright), in which one can sense a taste of horizontality being the building are fused with the ground surface.

(Source: Smithies, 1981, p.17).

should be enhanced and dramatised in all ways possible.

4.3.b THE VERTICAL DIRECTION

Contrary to horizontality, verticality, in expressing power, needs power to be established. As in Grillo (1975, p.208), when we ascend stairs at the youthful pace of one meter per second, we require from our muscular system energy equal to about one horse power.

As Arnheim (1977, p.33), says:

Climbing is a heroic liberating act; and height spontaneously symbolises things of high value, be it the value of worldly power or of spirituality. To rise in an elevator, balloon, or airplane is to experience being liberated from weight, sublimated, invested with super human abilities. 25

Vertical things penetrate the ground at right angles in order to establish the necessary interlocking for balance such as that in a tree. According to Simonds (1961, p.112), lines and shapes which are vertical give a feeling of strength, upward movement and balance.

Having a vertical terminate near eye level is a distressing visual experience. If the vertical termination is a wall as Simonds (1961, p.112), says, the top of such a wall or screen seems to slice or saw across the eyes of people looking at it.

The vertical elements in space establish their own reference points. The verticals of any space as Simonds says, must "attract, induce, arrest, amplify, explain, receive, deflect, direct, detain, and accommodate the

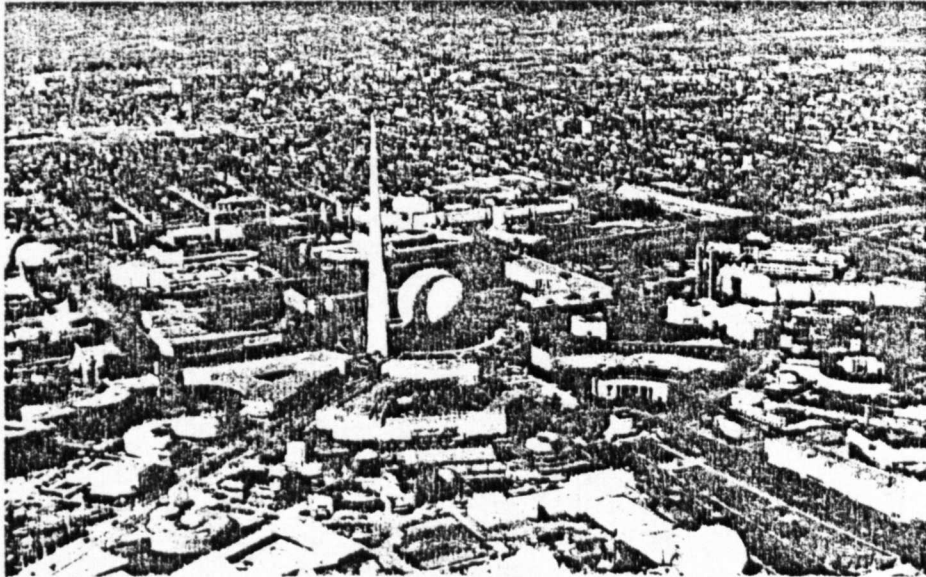


Fig. (4.9). Reference in space. The central symbol of New York World's Fair of 1939 plays a great task in identifying the site of the fair among the vast city.

(Source: Simonds, 1969, p.129)

planned use, as the area demands".²⁶ Vertical elements have the most important function in the creation of external spaces. They contain, articulate, and control it. In planning according to Simonds vertical elements can be used for setting up signs or symbols to be used in orientation, unless mystery, confusion or bewilderment is needed as a function of the plan.

4.3.c THE THIRD DIMENSION

It is known that one's physical ability to see the hidden face of a building is limited. However one can imagine incomplete things through using previous experience. Revealing the third dimension was a proposition, which artists over long periods of time have been concerned with.

Seeing things has two different moods. The first mood is called 'the orthogonal confrontation', the second is 'the oblique confrontation'.²⁷

The orthogonal confrontation, as Arnheim describes it as 'frontality', is a kind of eye contact. By assuming a frontal position a building or any of its parts adopts the stance of a good servant paying full attention to his master's wishes.²⁸

Of oblique projection by which the expressive quality of a building and its depth can be revealed, it was said (as in Arnheim, 1977, p.135) that there are

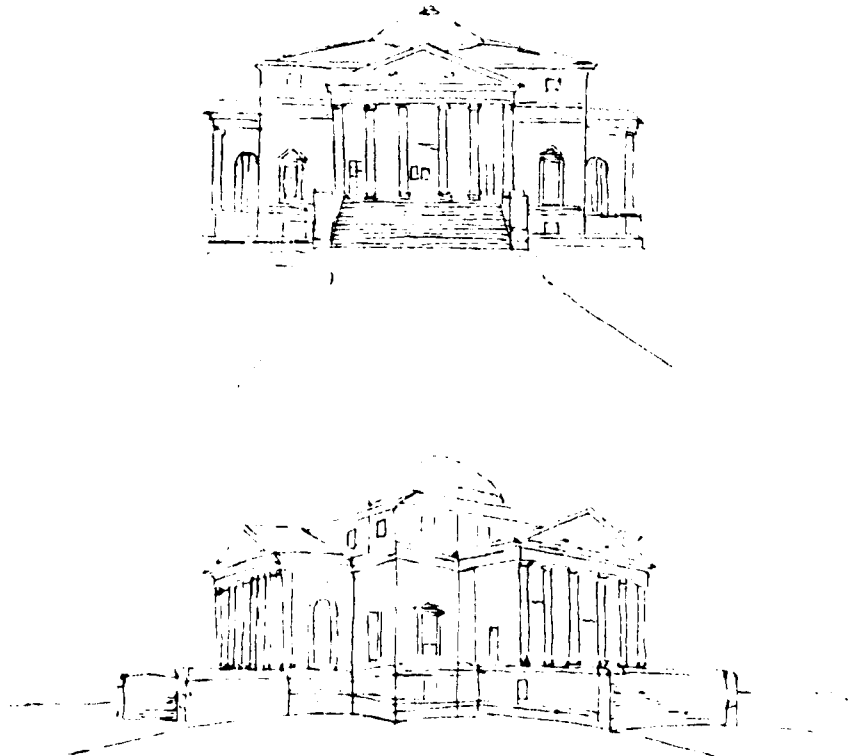


Fig.(4.10). Frontality and Obliqueness. In A. one can sense frontality by which a visual contact is established. In B. the building does not compromise with its visitor, rather it exposes to him its expressive quality.

(Source: Arnheim, 1977, p.140.)

ways, by which the architect can display the three dimensionality of shape and retain frontality for the time being. One example is a building whose side parts diverge and are therefore visible despite their foreshortening. Hexagonal, octagonal, cylindrical and rounded buildings, such as mosques or churches, also display their volume for the viewer; buildings at the intersection of two streets are similar.

Oblique projection as in perspective, is of pregnant mood. According to Arnheim (1977, p.142), perspective removes the building from the tranquility of the orthogonal mood and takes it to the dynamic realm of coming and going in the dimension of depth.

The High Renaissance developed the idea of 'design in depth' which was based on the dynamics of perspective. As in Bacon (1967, p.110), Bramant, the master mind of the High Renaissance, picks up and develops the idea expressed in 'The Ideal City'. Two arches recede deeply, and the perpendicular shaft of space is obviously defined, establishing a thrust of movement deep into the picture.

It was argued in Arnheim (1977, p.139), that the Acropolis of Athens does not compromise with its visitors, in that its main axis does not ally with the propylaea's axis. Therefore no direct visual connection makes the building look forward to the approaching visitor either as his servant or as his master, but according to

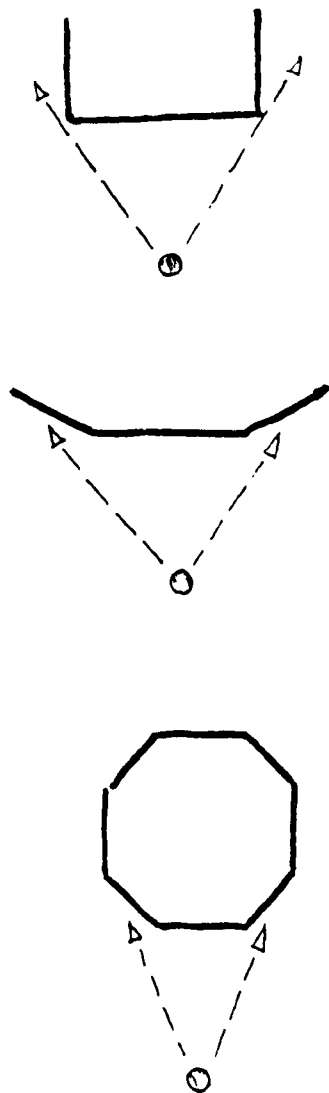


Fig. (4.11). The Third Dimension in Geometry, in which one can be able to understand why some forms can display their expressional qualities via exposing their lateral faces from the front.

(Source: Arnheim, 1977, p.136)

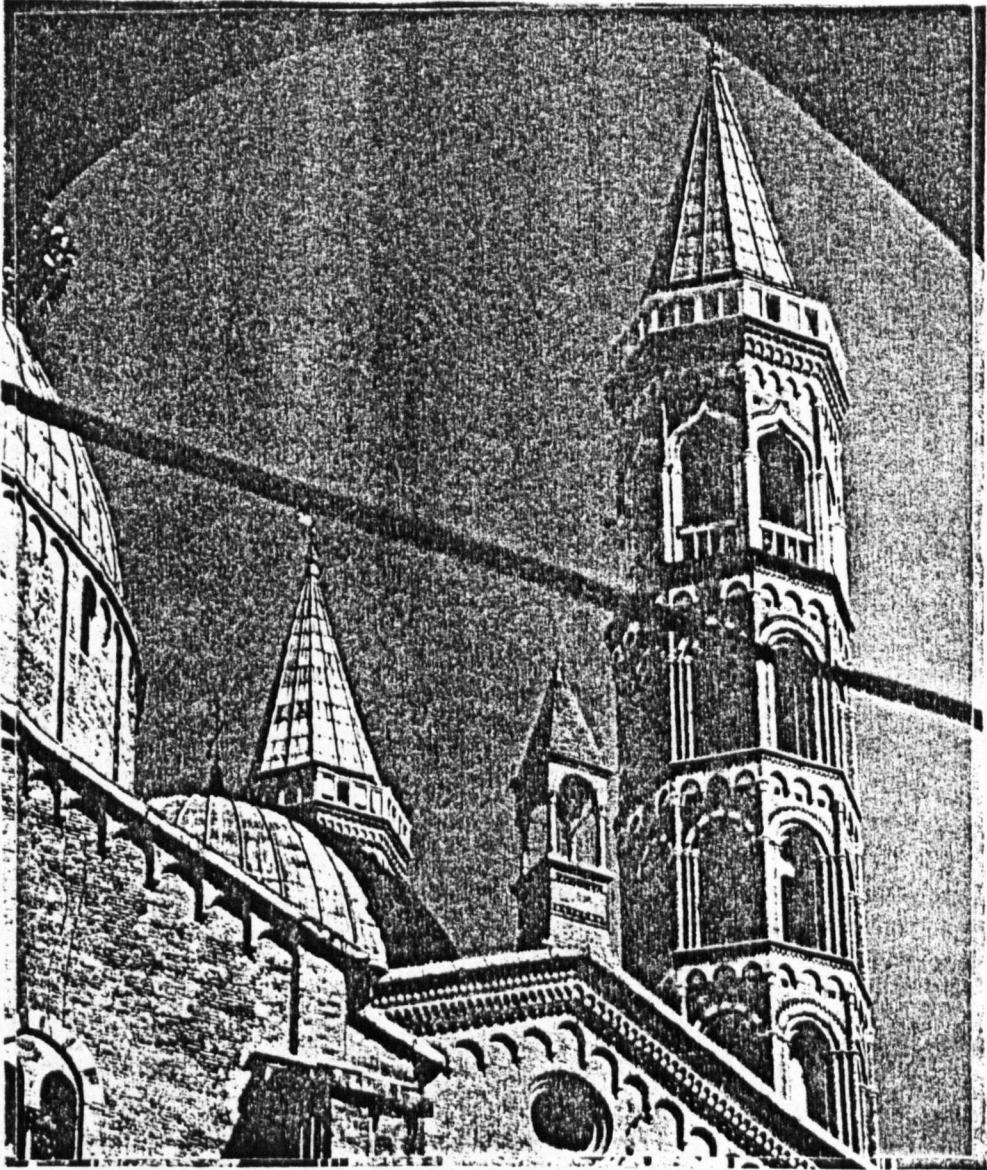


Fig. (4.12). The Third Dimension in Architecture.
By using an octagonal form, the spire of the church
could reveal its expressive quality.

(Source: Arnheim, 1977, p.137.)

Hesselgren (1969, p.328), the opportunity of walking which is given to the Parthenon's visitor, around the temple enables him to explore more of its expressional qualities.

In the site plan (Simonds, 1961, p. 65), it is possible for us to reveal the third dimension through the creation of earth or architectural platforms or pits, little rises, drops, and stops create exaggerated significance on the level site.

4.4 THE DYNAMICS OF EXTERNAL SPACE

It was argued that buildings issue around themselves a kind of visual field of forces in both directions. As in Arnheim (1977, p.25), Zucker observed that buildings' visual fields expand not only in the horizontal dimension but also vertically. As a result of these observations, Zucker pointed out also that such buildings inevitably will induce a definite ceiling to the sky above it, and its height can be understood as the limit of the field of forces that issues from the buildings on the ground, which cannot exceed a definite distance.

The relationship between an architectural setting and the surrounding space as the relationship between figure and ground or the relationship between positive and negative.

The architect's deliberate exaggeration of vertical

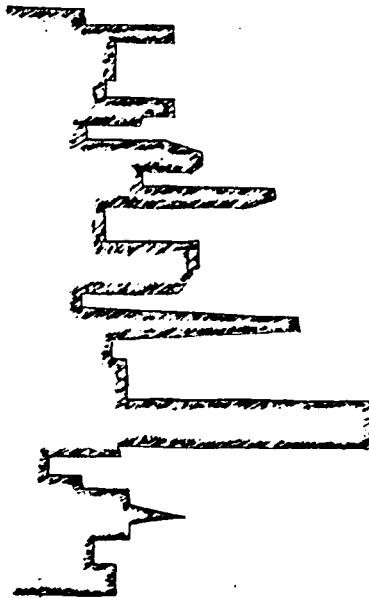
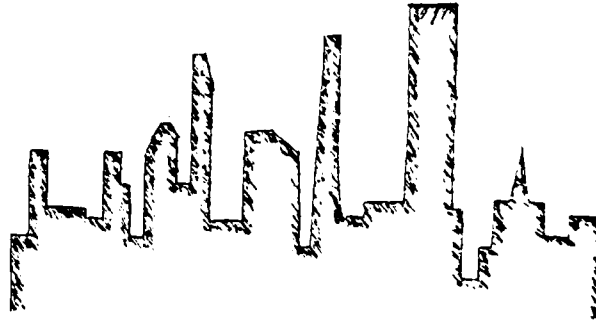


Figure (4.13). The skyline and the perceptual field of forces.

(Source: Arnheim, 1977, p.27.)

lines in buildings, endows it with upward movement which takes it up to the sky. That expressional mood (Anand, 1978, p.44), conforms to man's aspiration for the lofty, the high and the noble.

A symmetrical plan (Simonds, 1961, p.132), "has a quality of polarity. Each pole generates its own field of force, and between these two fields is a field of dynamic tension".²⁹

Among architects, the importance of these perceptual forces (Arnheim, 1977, p.28), has been acknowledged by Paolo Portoghesi. See fig. (4.14).

Baroque architects in the beginning of the seventeenth century established their own design technique in which architecture was dominating its setting. Bacon in his comment on the Baroque Architecture says:

It was extra energy in the Baroque period, resulting from the confidence inspired by the mystery of design technique, which produced the great interaction between structure and setting. This is demonstrated in Pierto da Cortona's work on the church and square of Santa Maria della Pace in Rome. ³⁰

According to Simonds (1961, p.180), opposing structures placed in space generate a field of dynamic tension, which its power, as Arnheim says, depends on the distance between them. Le Corbusier (Bacon, 1967, p.219) failed to establish a strong connection between his buildings in the governmental group in Chandigarh owing to the remotness of these buildings. Instead of the buildings dominating the space, conversely they are dominated by it.

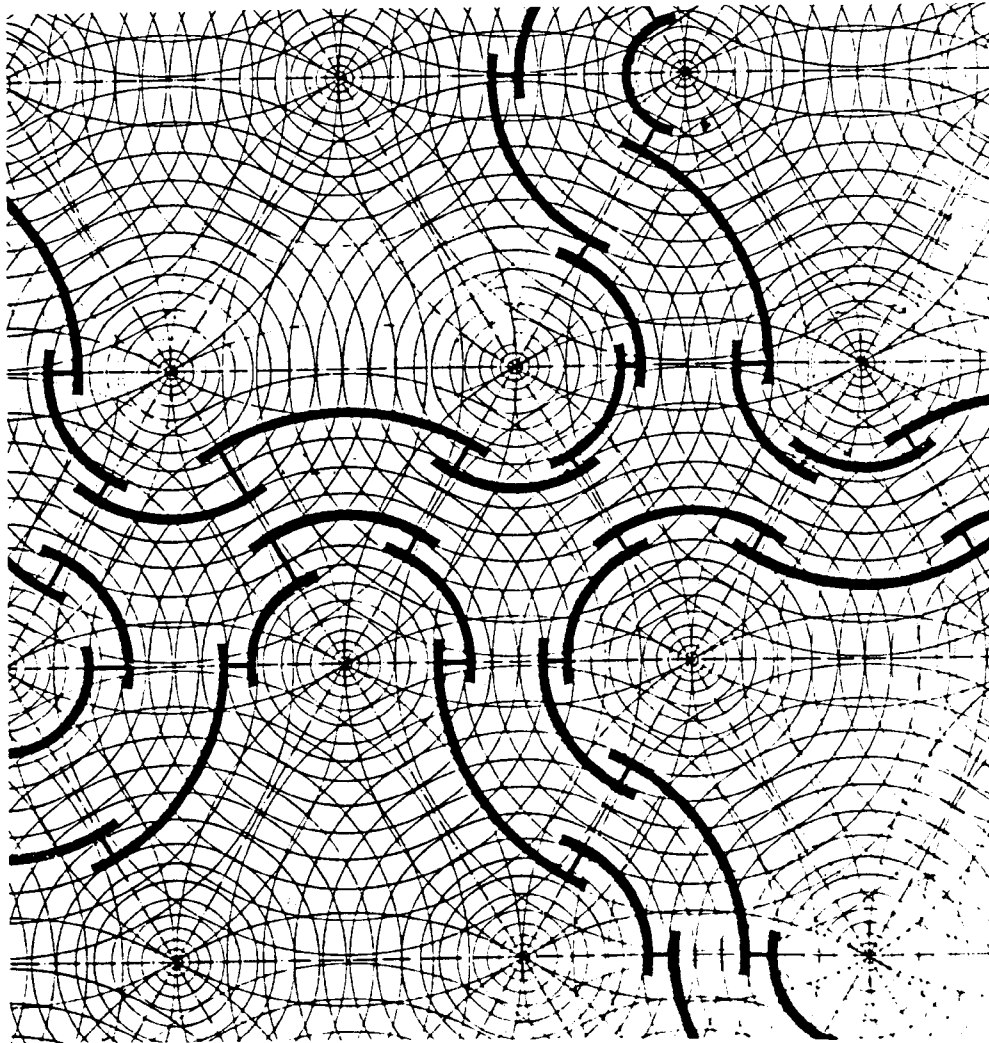


Figure (4.14). The perceptual field of forces in Portoghasi's drawing.

(Source: Arnheim, 1977, p.30.)

Space has a great impact upon the environmental setting. According to Anand, (1978, p.43), a lonely human in an extended space inevitably would feel despair existing in a wild desolated place.

Architecture and space were described earlier as positive and negative. According to Simonds (1961, p.19), a balanced relationship between them in the landscape is essential.

4.5 THE DYNAMICS OF INTERNAL SPACE

The status of space changes from situation to situation according to its degree of confinement. A totally free space is negative, but a completely closed one as in the case of the internal space of architecture or in the case of a closed square is positive.³¹

The human being like any other object represents a positive force within the space. The relation between man and the used space is a relative matter. According to Simonds (1961, p.86), planned spaces are usually considered only in relation to humans or the functions of humans.

According to Venturie "Architecture as the wall between the inside and the outside becomes the spatial record of this resolution and its drama".³²

The character of space is affected by sets of factors. The Orientals (Simonds, 1961, p.96), have

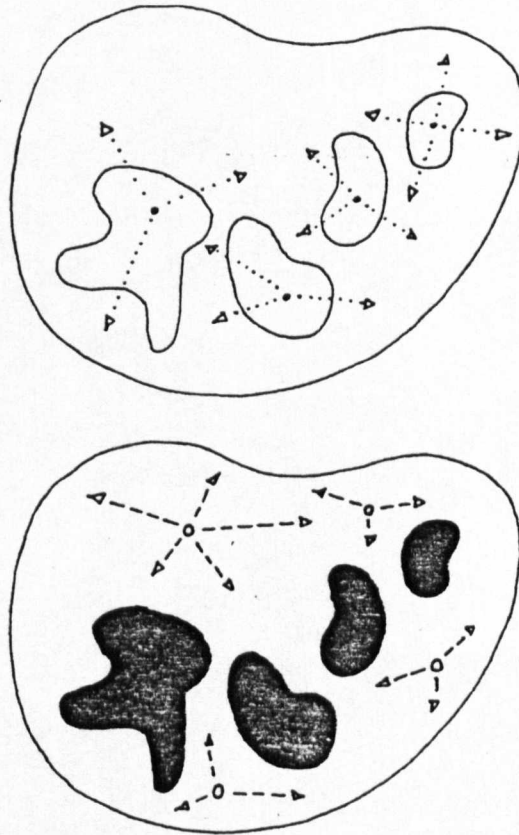


Fig.(4.15). Objects in space. This is a situation of interaction between positive and negative, of a relation between figure and ground.

(Source: Arnheim, 1977, p.70.)

deep understanding that significant spaces come through having an enclosure, and that shape, size and the character of enclosure determines the space quality; void, openness, or merely the expanse are not enough; they may be only emptiness.

Man's needs for shelter have arisen because an utterly exterior space has a terrifying attribute. According to Simonds a timid man in an expanded space would feel overwhelmed, lonesome, and unprotected.

From the perceptual viewpoint, a completely defined space has an immeasurably great impact on its boundaries. According to Arnheim (1977, p.86), the field of forces in the case of a circular square, open space expands in all directions and is confirmed visually by the concavity of the boundary facades.

As in the case of a free expanded setting high closed space has a terrifying impact on a man standing inside it alone such as what happens in a situation where a person stands alone beneath a cupola.

The relationship between solids and voids in a defined open space is of great importance. As in Simonds (1961, p.175), a confined outdoor volume is a well of space. Its very hollowness is its essential property. The solid has no meaning without the corresponding void, by which we can sense the interaction between the two.

The skyline of a building is the representation of the interaction between the positive internal forces of

those actions performed inside and the negative external space. The skyline of a building or that of a set of buildings has a dynamic and sound quality. The Dutch city Zaltbommel (Bacon, pp150-151), shows a good example in which the spire of the church marks the city centre and dominates the other scattered spires throughout the space.

The city of London had started by the beginning of the twentieth century to lose the fineness of its skyline. According to Bacon (1967, p.200), the modern high towers have engendered a competition with Saint Paul's Cathedral.

According to Arnheim the skyline of a building or of a city can be read in a way in which the eye starts scanning the composition from its centre and it ends at the two sides in one time or vice versa.

The dynamics of internal spaces are of great importance. In hospital and hotel passages, the exact repetition of the same features would create a state of monotony. Applying the 'temporary retardation' concept would avoid this and would bring life, excitement and unity to our spaces.

As in Arnheim (1977, pp.155-158), the temporary retardation concept means establishing the relation between consecutive confined and free spaces, in which a person experiences a feeling of confinement and suppression relieved later by his experience of the consequent free space.

Using a clever technique of concealment and revelation will evoke life and excitement to our spaces.

According to Simonds (1961, p.119),

(Our main prospect should not be) wasted in one first blast, but it (should) be conserved and displayed with perhaps more refinement, but certainly with no less feeling for suspense and timing, than shown by the striptease artist. 33

As an application of the temporary retardation concept Simonds mentions that the idea was carried out successfully by the French landscape designers in Versailles and in the Place de la Carrier.

4.6 INSIDE AND OUTSIDE

It was mentioned earlier (Venturi, op. cit., p.87), that architecture as the wall between the inside and the outside becomes the spatial record of this resolution and its drama. One can understand from Venturi's description that a building's facade is considered to be an interpreter of those actions taking place on both sides. One might also ask a question: does the relation between inside and outside the building has any limits? Does the building's form have any spatial impact upon its environment? As in Hesselgren (1969, p.336), the answer to the first question can be understood from the following quotation written by him:

The ideal (relation between inside and outside) is of course, to create a building where the dialogue between outside and inside is perfect, and where the exterior introduces the interior. This means

that the emotional expression of the two shall correspond. It is left to the intuitive ability of the individual architect to decide how such a correspondence shall be achieved. 34

The modern church at Ronchamp is exemplified by Hesselgren as the supreme example in which the exterior convincingly corresponds to the interior and prepares one for it. As in Arnheim (1977, p.104), the theatre of Paolo Portoghesi in Cagliari shows us another good example in which the inside and outside correspond. See Fig. (4.17).

Establishing the right expectation of a building's interior depends (Schulz, 1963, p.136), on the clarity of the interpretation of its boundaries.

According to Arnheim, a building whose inside conflicts with his outside inevitably would confuse and disconcert the viewer. The Pantheon of Paris can be quoted as an example in which the building's inside and outside form a discrepancy relationship.

The relation between the inside and outside of the building has some limits which must be taken into the designer's account. The first of these limits is 'the more you declare outside, the less excitement you get inside. As in Arnheim's quotation:

The frankly informative appearance of building whose inside holds few spatial secrets, offers little of the teasing richness and sophisticated complexity found in architectural styles that deviate from such elementary parallelism. Simple parallelism also reflects little of the dramatic struggle by which the architect must plan from the inside and from the outside at the same time. 35

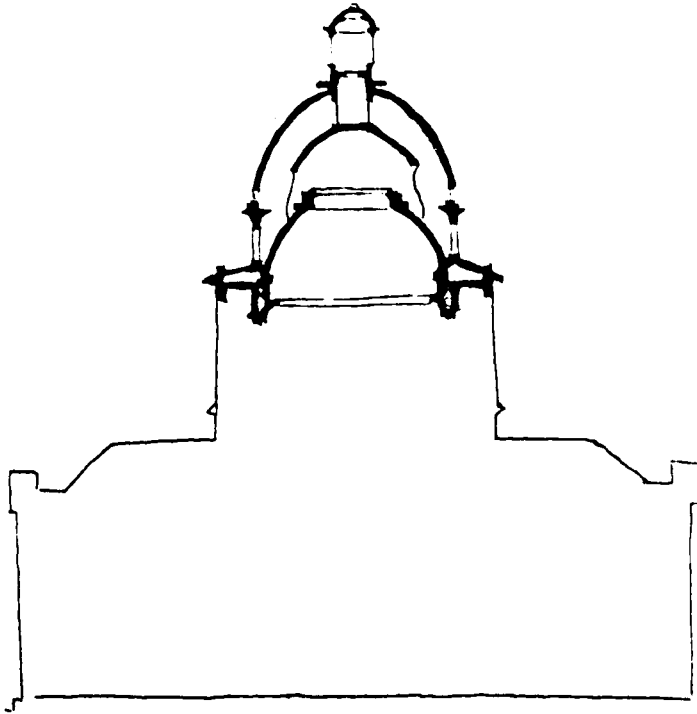


Fig. (4.16). Discrepancy and disconcert. The Pantheon of Paris confuses his viewer

(Source: Arnheim, 1977, p. 105.)

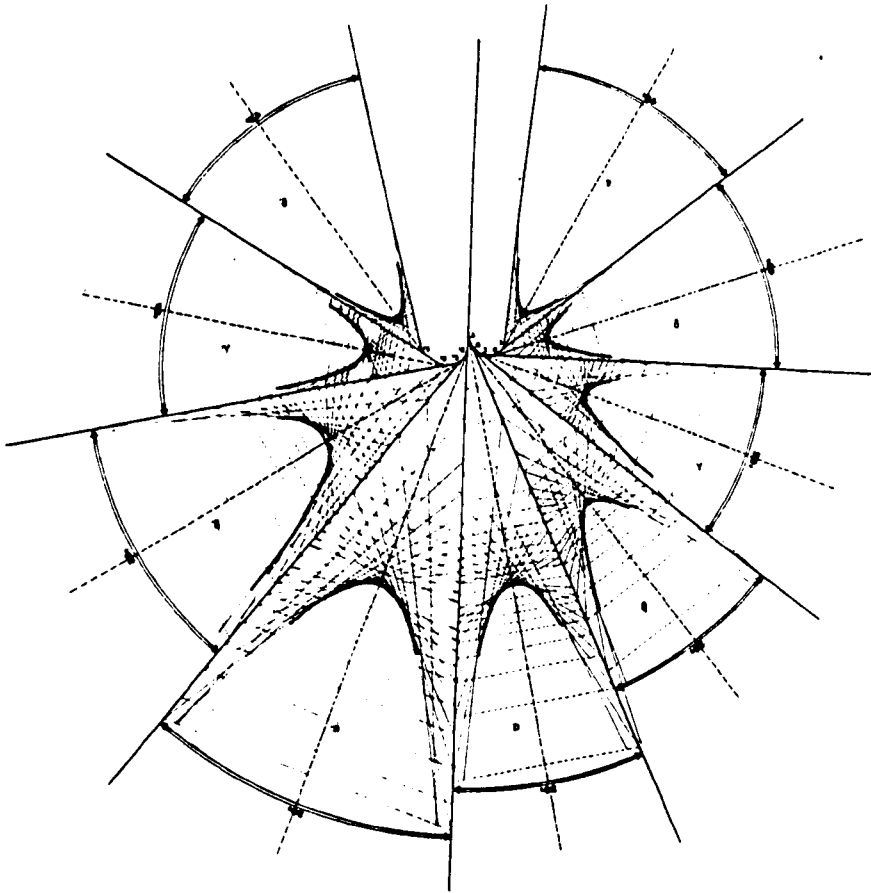


Figure (4.17). As inside as outside. The Theatre of Cagliari by Portoghesi shows a relation of correspondence between inside and outside, by which a sense of expectation is created.

(Source, Arnheim, 1977, p.104.)

Contrary to the first limit the second limit is 'the less you reveal outside the more excitement and probably confusion you get inside'.

A good relation between inside and outside the building can be attained if our solution comes to a point between the last two limits. Neither should they produce a situation in which there is no place for excitement and exploration, nor should they be of discrepancy status producing a situation full of confusion. They must come together to such a unified mood in which one can experience acquaintance, thinking and surprise.

The porch of the Parthenon as Hesselgren says, establishes a transitional stage in a consecutive relation between inside and outside the temple.

In Architecture Hesselgren says that:

Exterior and interior are not incomparable antitheses, but should better be regarded as the two extremes in a polar series. Intermediate forms, where the exterior floats imperceptibly over to an interior, can be found everywhere in the history of architecture, from the colonnade Greek temples to modern buildings. The emotional value that can be hidden in stressing the differences between out and in should not be forgotten. 36

In Baroque architecture one can see a perfect example of unity between a building and its environment. According to Bacon (1967, p.147), the rhythmic forms of the aisles and vaults of Saint Agnazio are extended across the square in the curved house walls which define the three interconnecting ovals in the plan.

The aesthetic problem of inside and outside the

architecture is a proposition to which the purist pays attention. The game of marrying the two (Smith, 1979, p.39), in an organic way is of great importance to architects.

Contemporary planning and architecture are criticised (Smith, 1974, p.179), because all their secrets and their visual assets are totally revealed. We should learn to build secrets in, or to allow scope of mazes to grow spontaneously.

4.7 THE VISUAL WEIGHT

It was acknowledged that objects vary their perceptual visual weight, and the variation depends on their distance from the ground, the load, and finally on their potential energy.

We all know that physically gravitational pull diminishes with increasing distance from the centre of attraction; i.e. the object loses weight. This phenomenon has a perceptual affinity, where visually weight can be perceived lighter at a greater distance than it looks at low distance. According to Arnheim (1977, p.46) at greater height, objects seem less subject to the pull from below. The upper parts of a high-rise building look as though they had been let off the leash. Le Corbusier suspended building (Bacon, 1967 p.217), shows a good example of an amputated architecture from the land, in which one can feel lightness being its gravitational

centre is further from the ground compared with the ordinary building which lies directly on it.

Contemporary Russian architecture is characterised (Lewis, 1968, p.242), by a great deal of dynamics as its structures are 'floating' suspended in the air and stabilised by tension cables.

According to Smith (1979, p.28), the perceptual weight must be distributed to produce visual stability, either by symmetry or by balanced and simple asymmetry.

Architectonic forms made of different parts and different materials should have visual logic and balanced weights, i.e. a strong base must carry a relatively heavy mass, and a delicate one must carry a light weight. As in Arnheim (1977, p.47), the hospital of Northwick Park, England, can be quoted as an example in which its parts are of balanced visual weight relation. In that instance the designers have determined the number of structural uprights on each floor in accordance with the physical load expected to be carried. The early design of the Washington Monument is another example in which Arnheim shows us a case of discrepancy in visual weight. The monument was expected to be formed of an Egyptian heavy obelisk considered to be resting on a low circular building whose exterior presented a colonnade of tiny delicate Doric columns.

A special trick can be used by architects to reduce the visual weight of their buildings. By ribbing the

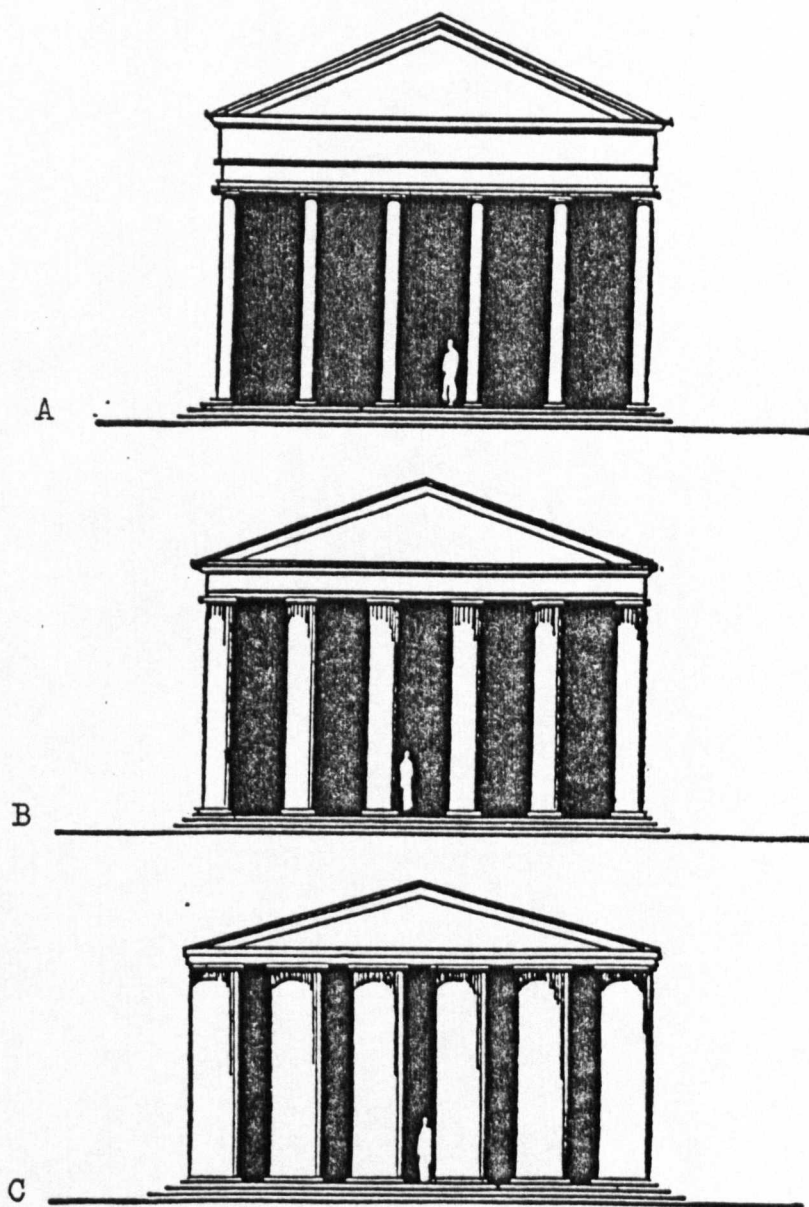


Fig. (4.18). Visual Weight and Proportion, in which B. shows the best relation of visual weight proportion between the parts of the Greek temple.

(Source: Hesselgren, 1969, p.156.)

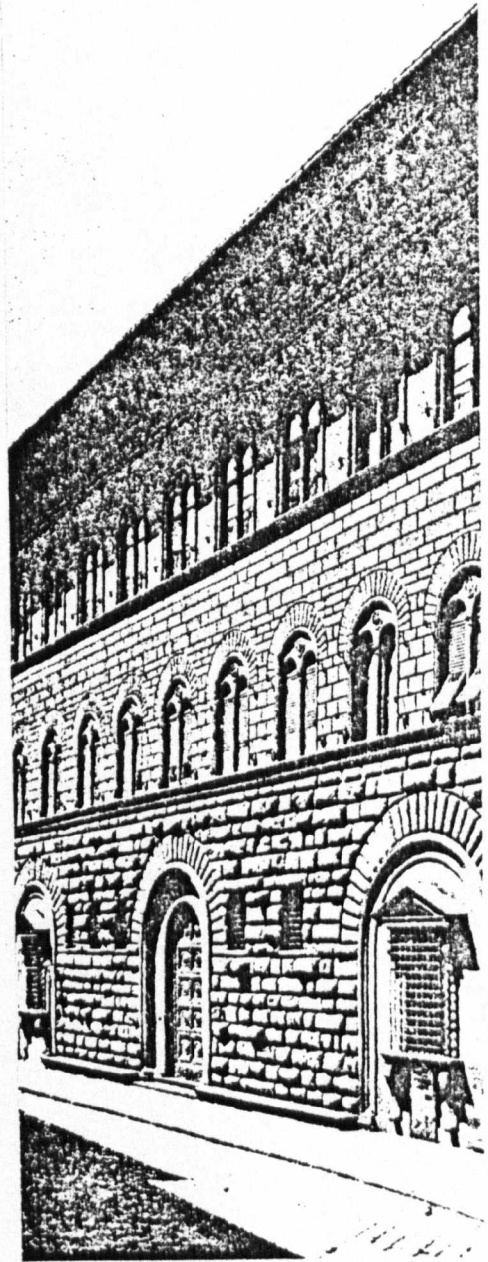


Fig. (4.19). Material and visual logic. The relation between the three stories is of sensitive, physical and visual establishment being harsh and projected blocks of stones are carrying

(Source: Hesselgren, 1969, p. 227.)

outer surface of Santa Maria de Fiore Dome in Florence, Brunellescki has reduced its perceptual weight. As in Argan (1969, p.25).

Brunellecki....declared that he wanted it (the dome of Santa Maria) to be as 'full and magnificent' as possible and he therefore proposed to give the great volume of the dome an effect of lightness which would free it, like a huge balloon, in the open sky above the city... It is enough to say here that the very ribbing which gave tension and energy to the dome clearly formed a perspective structure, and that perspective was for Brunellescki the universal structure of space. 37

Illumination, colour and texture (Schulz, 1963, p.135), play an important part in defining the identity of the mass elements and the visual weight. The treatment of the surfaces determine the degree of massivity.

As in Hesselgren (1969, p.258), the alternatives of Greek colonnades used by the experimental psychologists Wood, Worth and Marquis, have proved that the median gives the best expression of support, being its columns neither slender nor gigantic. See Fig. (4.18).

4.8 THE SYSTEM OF MOTION

The system of motion plays a great role in joining the parts of any organic constitution. As in the city the unity of its scattered bits and pieces can be attributed to the favour of the motion system. As in Grillo (1975, p.208), no country can be known and developed without roads. A building or a group of buildings are similar to a continent in the way that their parts are

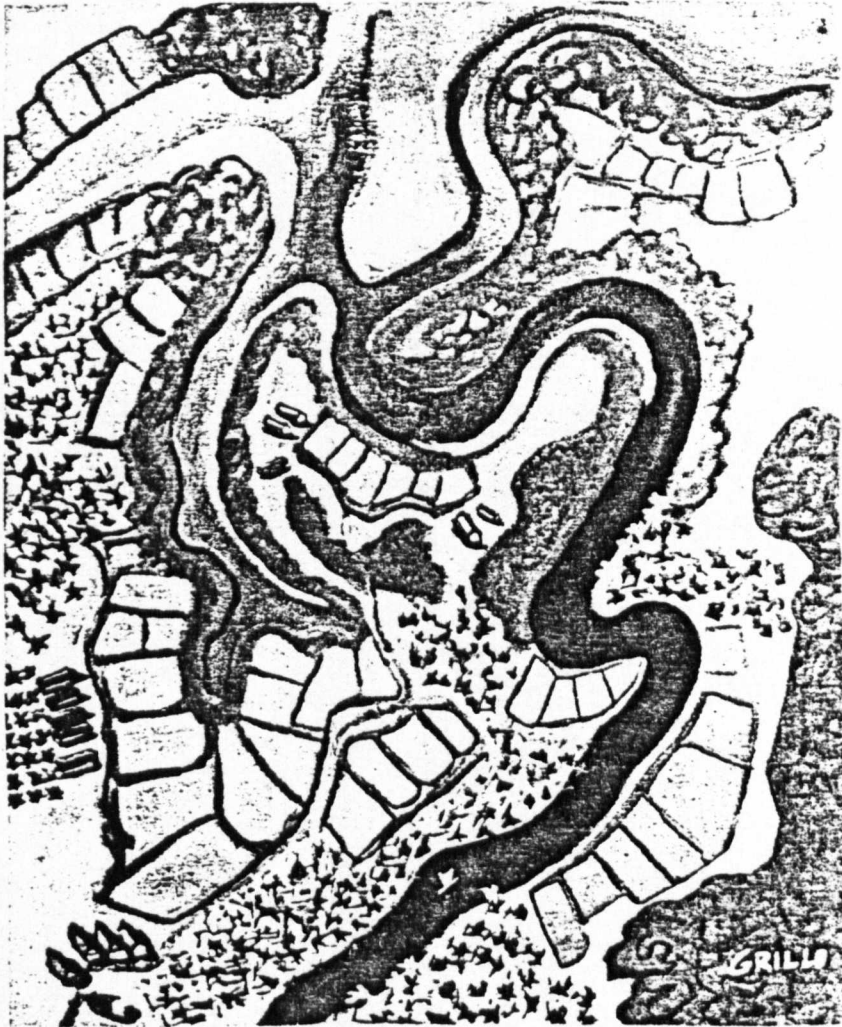


Fig. (4.20). Life in Landscape. A pastel drawing by Grillo of his native village in Brazil shows how much life

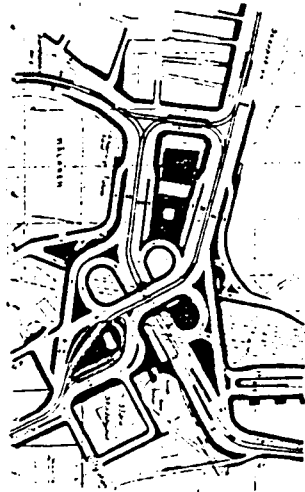
(Source: Grillo, 1975, p.207.)

full of potential riches of many kinds. A comparison between the way of linking the body structure and building structure can be established, where the parts of each are different in size, function, and position. To link these areas together organically, we need to establish a complex and thoroughly studied web of connection, very much like the circulatory and nervous system in a living body.

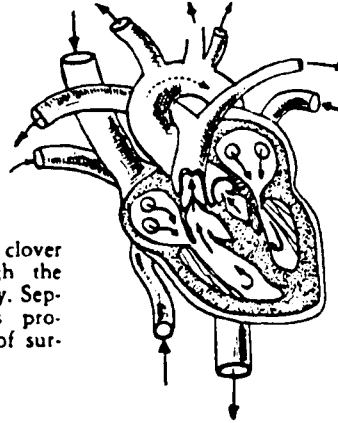
In every system, we have to differentiate between the main arteries which connect the three main areas and the circulatory system of blood vessels, nerves and capillaries that link the major organs together.

The axis has always been accepted as a connecting element. As in Simonds (1961, p.123), the axis is a linear element which connects two or more points. The axis can be seen in different ways, as a court, as a wall, as a drill field, as a path, as a drive, a city street, or as a monumental parkway. But it must always be regarded as a connecting element. In the planning process once the axis is introduced into the landscape it becomes its dominant feature. Having sketched a complex plan, it becomes so insistent that all other design elements must be related to it directly or tacitly. The axis being a strong landscape and planning element, it tends to subjugate or neutralise other landscape features.

Paths and roads play a vital role in liberating



Stockholm, Slussen: clover leaf surgery through the "heart" of an old city. Separate channeling is provided for all kinds of surface traffic



section of a human heart showing the crossing of the main blood highways

Fig. (4.21). Like a human heart, like a city heart. A surgery of Stockholm clover leaf shows its similarity with the human heart.

(Source: Grillo, 1975, p.213)

the stored potential energy of the organism parts. According to Grillo programme like a tract of rich and fertile earth holds a mysterious amount of potential energy in its different parts that is ready to be discharged as soon as paths and roads are extended skillfully to connect them. Life then begins to flow, and a new organism is launched into life.

The movement system of a leaf and that of a city can be compared. As in Bacon (1967, p.114), the veins of a leaf or the branches of a tree as we can see in Klee's drawings are comparable to the channels of movement of people and goods within a city.

4.9 SYMMETRY AND DISSYMMETRY

Symmetry and dissymmetry are only the two moods which forms and shapes can take. As in Grillo (1975, p.173), the word symmetry as we use it today has come to mean geometrical symmetry, or mirror-like reflection, a strict duplication of forms and shapes arranged on both sides of an axis. Symmetry as a concept has been applied in architecture since Greek times up to the Roman revival in architecture at the start of the twentieth century.

Symmetry has many abstract qualities. First it represents, as Grillo says, the dictatorial rule of a somewhat elementary reasoning over sensitivity and

intuition.

The symmetrical plan has a despotic quality. According to Simonds (1961, p.134), architectural elements in symmetrical plan are subjected to a rigid or formalised pattern.

A symmetrical plan must express a symmetrical function. As Simonds indicates, a symmetrical plan may be of geometric design. Such a plan will be excellent if we manage to express its function geometrically.

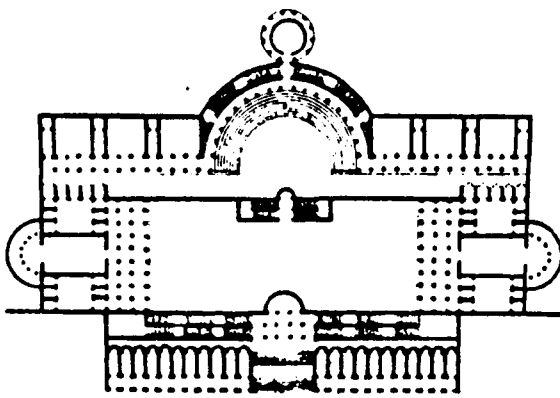
A symmetrical plan of geometrical forms could destroy desirable landscape character if geometry has been used without any reason.

Although symmetrical plans have the advantages of being direct and easily comprehended, they also have the disadvantage of monotony, if seen often or for long.

A symmetrical plan is of a great aesthetic value. According to Simonds,

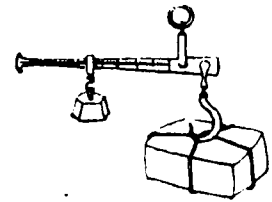
In the western world symmetrical is synonymous with beautiful and has connotation of pleasant and handsome form. Perhaps this is because it implies an order to the scheme of things that is easily comprehended and thus enjoyed by man. Perhaps it is because the word 'symmetry' has come to be associated with plain clarity, balance, rhythm, stability, and unity, which are all of positive qualities. Perhaps it is because man himself is symmetrical and takes pleasure in the relationship. 38

A symmetrical plan is not valid when the intention is to build an environment of experiential free quality. As in Simonds (1961, p.136), a symmetrical grouping should be avoided where the context of the structures or area is



A

SYMMETRY



DISSYMMETRY

B

Fig. (4.22.) Symmetry and dissymmetry. A Roman building of symmetrical plan, as in A. shows tension of polarity between its two axes. Dissymmetry as in B. shows stability, excitement and freedom.

(Source: Grillo, 1975, p.198.)

natural, organic, experimental, or where the human eye, mind and spirit are to be set free.

The symmetrical plan has a quality of polarity. Each pole, as Simonds says, generates its own field of force, which between them, a field of dynamic tension is established.

The aesthetic value of symmetry has been accepted since the days when Vitruvius recorded his thoughts: "No building can have a good composition if symmetry and proportions are neglected".³⁹

Assymetry or dissymmetry as a mood of natural or man made forms is different from symmetry. As in Grillo (1975, p.173), dissymmetry means a balanced object which is not symmetrical.

A mobile, perfectly balanced object in mid air is an example, in which the weight of one side is balancing the other side, around the point where it is suspended. This point which we can call the centroid of composition coincides exactly with its centre of gravity.

Being of variable events, parts, and shapes, dissymmetry is preferred whenever excitation, movement and vitality are needed. As Hesselgren (1969, p.201), assymmetrical forms are preferred by artists whenever excitement and drama are required.

Dissymmetry today is commonly used by architects and its counter 'symmetry' as in Schulz (1963, p.143) is not.

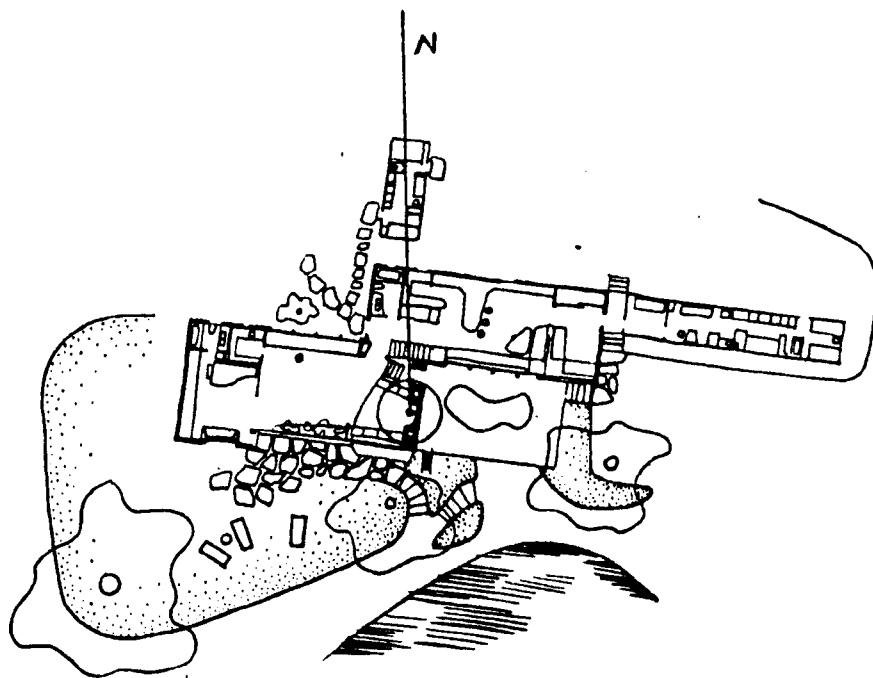


fig. (4.23). Dissymmetrical plan.
(Source: Grillo, 1975, p.199)

CHAPTER 4 : NOTES AND REFERENCES

- 1 Anand, Mulk R., Seven Little Known Birds of the Inner Eye (Charles E. Tuttle Company, Rutland, Vermont: Tokyo, Japan, 1978), p.47.
- 2 Simonds, John, Landscape Architecture (London, Iliffe Books Ltd., 1961), p.93.
- 3 Meyer, Lucio J.J. de, Visual Aesthetics (Lund Humphries London, 1973), p.13.
- 4 Issac, Arg, Approach to Architectural Design (London Iliffe Books, 1971), p.67.
- 5 Valantine, The Experimental Psychology of Beauty (Methuen & Co. Ltd., 1962), p.76.
- 6 Schulz, Norberg, Intention in Architecture (Universitetsforlaget. Allen Runwin Ltd., 1963), pp.141,152.
- 7 Anand, Mulk, R., (1978), *ibid.*, p.47.
- 8 Simonds, John (1961), *ibid.*, p.94.
- 9 See Meyer, Lucia J.J. de, (1973), *ibid.*, p.45 and Bacon, Edmund, Design of Cities (Thames & Hudson, London, 1967), p.114 and see Grillo, Paul, J., Form, Function & Design, (Dover Publications, Inc., New York, 1975).
- 10 Whyte, Lancelot L., Aspects of Form (Lund Humphries, 1968), p.8.
- 11 Kepes Gyorgy, Structure in Art and in Science (Studio Vista, London, 1965), introduction.
- 12 Simonds, John (1961), *ibid.*, p.11.
- 13 Arnheim, Rudolf, The Dynamics of Architectural Form, (University of California Press, London, 1977), p.105.
- 14 Smithies K.W., Principles of Design in Architecture (Van Nostrand Reinhold Company, 1981), p.9 and you can see Grillo, Paul J. (1975), *ibid.*
- 15 Palmer, Frederick, Visual Awareness (B.T. Batsford Limited, London, (1972), p.46.
- 16 See Schulz, Norberg, (1963), *ibid.*, p.140 and Arnheim, Rudolf, (1977), *ibid.*, pp188-89.

- 17 Hesselgren, Sven, The Language of Architecture (Applied Science Publishers Ltd., London (1969), part 1, p.280.
- 18 Smithies, K.W., (1981), *ibid.*, p.29.
19. Arnheim, Rudolf, (1977), *ibid.*, p.256.
- 20 *Ibid.*, p.255.
- 21 See Grillo, Paul J., What is Design (Paul Theobald & Company, Publisher, Chicago, 1960), p.21 and Meyer, J.J. de Luccio, (1973), *ibid.*, p.45, and Bacon, Edmund (1967), *ibid.*, p.114 and 125.
- 22 Meyer, *ibid.*, 1973, p.20.
- 23 See Arnheim, Rudolf, (1977), *ibid.*, p.44, and Smithies, K.W. (1981) *ibid.*, p.15.
- 24 See Simonds, John, (1961) and Anand, Mulk R., (1978), *ibid.*, p.44.
- 25 Arnheim, Rudolf, (1977), *ibid.*, p.33.
- 26 Simonds, John, (1961), *ibid.*, p.113.
- 27 Arnheim, Rudolf, (1977), *ibid.*, pp.134-43.
- 28 *Ibid.*
- 29 Simonds, John, (1961), *ibid.*, p.132.
- 30 Bacon, Edmund (1967), *ibid.*, p.129
- 31 Arnheim, Rudolf, (1977), *ibid.*, pp.20-87.
- 32 Venturi, Robert, Complexity and Contradiction in Architecture, (The Museum of Modern Art, 1966), p.87.
- 33 Simonds, John, (1961), *ibid.*, p.119.
- 34 Hesselgren, Sven, (1969), *ibid.*, p.336.
- 35 Arnheim, Rudolf, (1977), *ibid.*, p.102.
- 36 Hesselgren, Sven, (1969), *ibid.*, p.352.
- 37 Argan, The Renaissance City, (Studio Vista, London, 1969) p.25.
- 38 Simonds, (1961), *ibid.*, p.132
- 39 Hesselgren, *ibid.*, p.210.

5.1 THE EXPRESSIONIST ASPECT

It has been accepted for a long time that perception relies mainly on the expressionist mood of those objects which are visualised within the visual array. Architecture can express itself in ultimate moods in the same manner as human beings. As in Hesselgren (1969 p.252):

The array of facial expression forms a part of the physical and mental totality which the angry person represents. In a similar manner the architectural expression forms a part as the semantic active component in the mental totality which the experience of a consummate piece of architecture involves. Architectural expression, however, is not the same as the explosion of animation. 1

According to Sharp (1966, p.21), the actual term 'expressionism' appears to have been introduced by the French painter, Julien-August Herve, as early as 1901. A few years later the French term 'expressionismes' introduced by Herve began to appear in Germany. As in Lampugnani (1982, p.8),

Expressionist architecture, which emerged largely independently in a number of places during the first world war and was represented by such different characters as Hans Poelzing and Rudolf Steiner, found a crystallisation point in the Arbeitsrat Fur Kunst, formed in 1918 under the leadership of Bruno Taut and Adolf Behne. 2

As a feature of its age, Expressionism, as Lampugnani indicates, "carried with it architects who would not otherwise have been inclined to subjective expression or passionate outbreaks".³

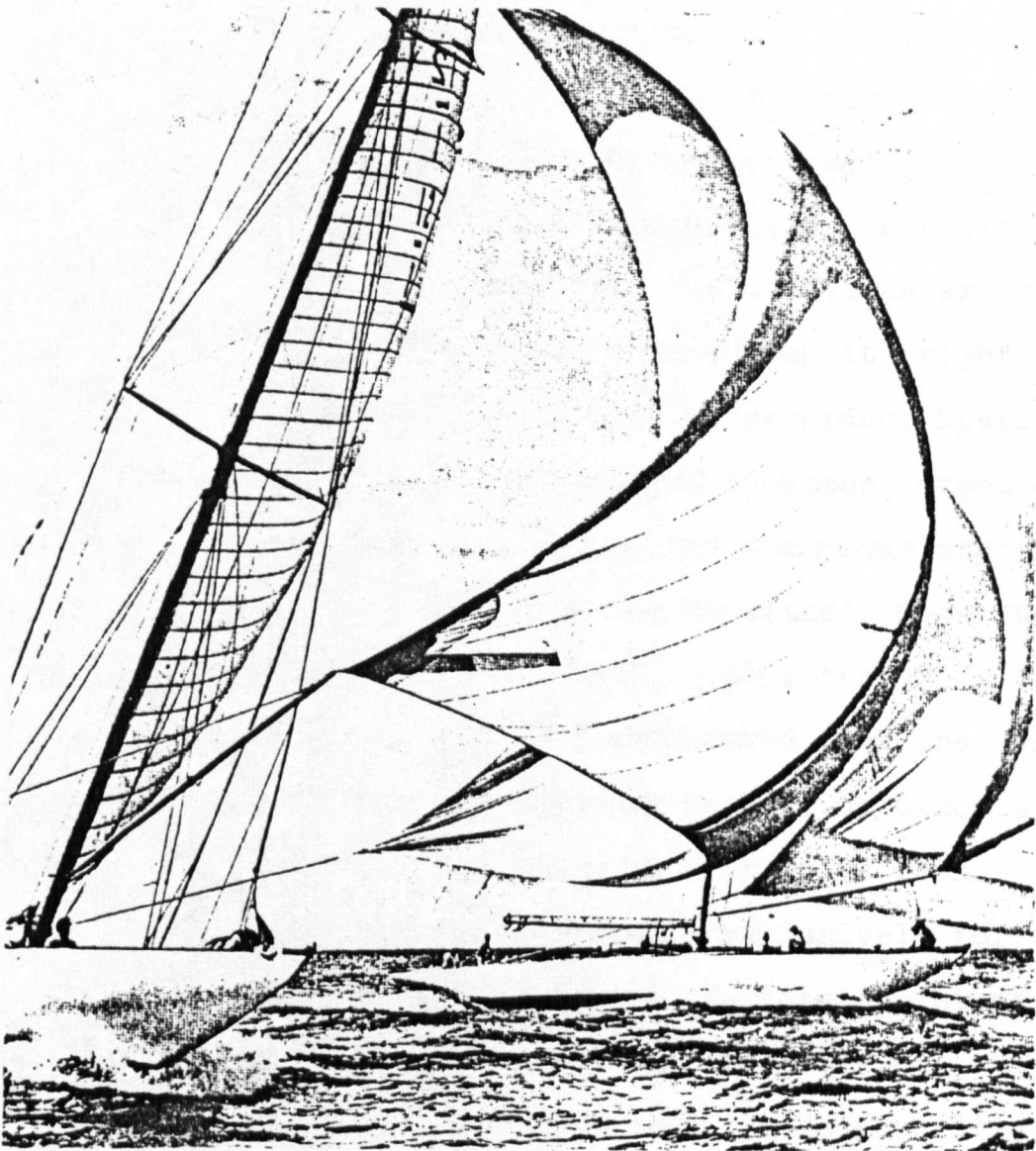


Fig. (5.1). Dynamics and Expression. The yacht's sails show a clear visual expression of how the boat is propelled by the wind.

(Source: Hesselgren, 1969 , p.159.)

Expressionism as a modern movement is, as Sharp says, "The modern tendency among painters, dramatic authors etc., to subordinate realism to the symbolic or stylistic expression of the artist's or character's inner experience".⁴

According to Drew (1972, p.45), "Expression is simply a device for enhancing architectural meaning".⁵

One of the Expressionism's pioneers is Jorn Utzon. Utzon as an architect substituted the anonymous expression which had existed in his time, reasserting its right over and beyond the purely utilitarian.⁶ The Sydney Opera House as an architectural example designed by Utzon, exposed clearly his philosophy in letting the anonymous expression reveal and express itself over the building's more functional aspects. As in Drew (1972, p.45), the major functional and structural problems associated with the Sydney Opera House have been considerably reduced by Utzon with the aim of getting and creating an expressive form.

The word Expressionism was kept exclusively for German art, and it ran parallel to the development of Cubism in France and of Futurism in Italy.⁷

Expressionism as an architectural movement followed the outbreak of that movement in art and literature, and consequently was influenced by it in many ways.⁸

Mendelsohn, as in Tafuri and Dalco (1980, p.162), is an architect whose work has been inspired by paintings.⁹

The Expressionist movement has been affected by Cubism. As in Drexler (1980, p.48), "The Expressionist

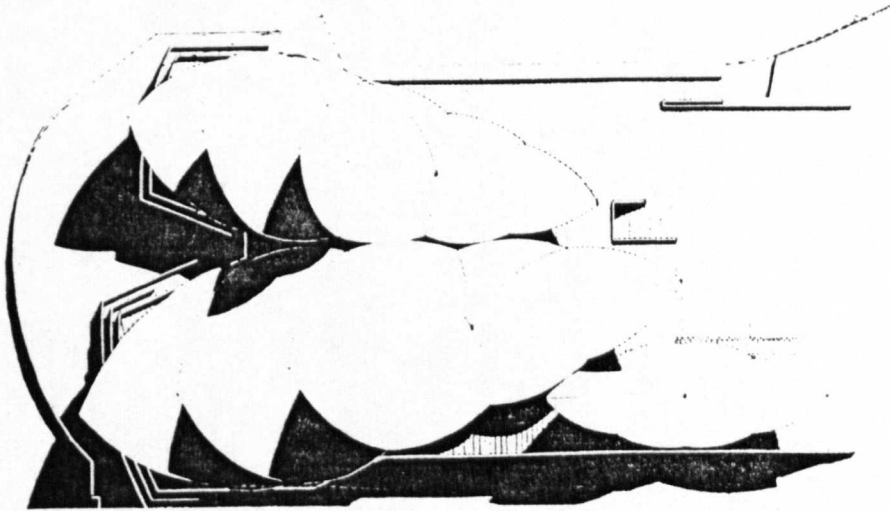
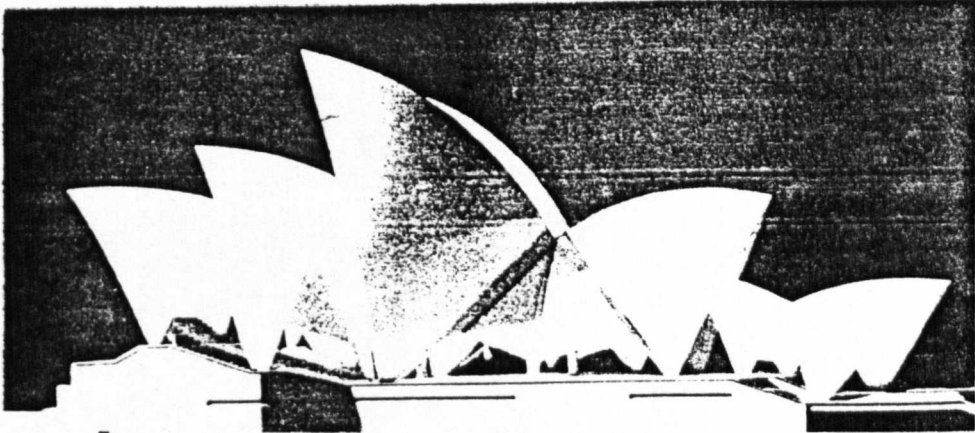


Fig. (5.2). Sydney Opera House.
An Architectural example of dynamic and expressional
mood. Architect, Jorn Utzon.

(Source: Drew, 1966, p.50.)

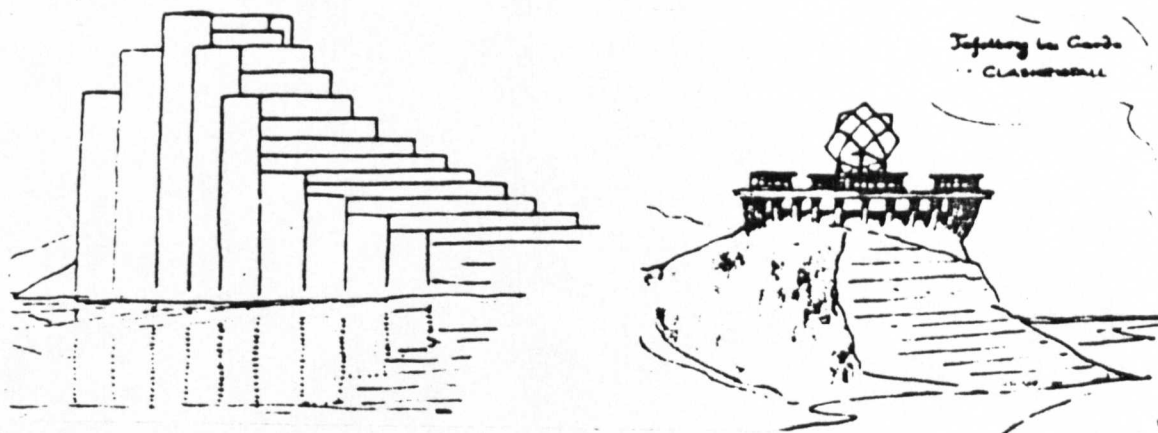


Fig. (5.3). Bruno Taut, 'The Rocks Live, They Speak...', 1919.

(Source: Tim, 1975, plate 68.)

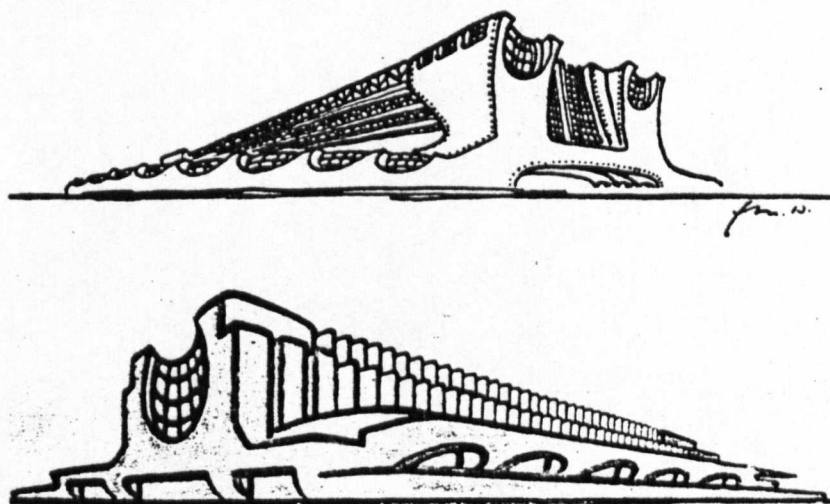


Fig. (5.4). Erich Mendelsohn. Design for car factory and goods storehouse (1914-15).

(Source: Tafuri, 1980, p.166.)

impulse is not necessarily combined to points, angles and curves: it may also draw from Cubism".¹⁰

Culture influences expressiveness very significantly.

According to Smithies (1981, p.22):

Upbringing, religion, education, reading and television provide many shared influences. Spheres of interest will occur at different levels - also we could say that there is a European background to the whole of western culture within which exists a number of national 'spheres'."

Associational Expressionism as Smithies says, occurs in a direct way when certain conditions are suggested by a design. "A building on a heavily rusticated plinth or a wider base implies heaviness, while an undercut base or under-framing will suggest lighter form."¹²

Expressionism (Arnheim 1977, p.253) relies on the dynamics of visual forms. Dynamics, as described by him, "are a property supplied by the mind spontaneously and universally to any form perceived and organised in such a way that its structure can be grasped by the perceiving nervous system".¹³ Expressiveness uses generic qualities as communication instruments. These qualities, as described by Arnheim are straightness, flexibility, expansion, contraction, openness, closeness, containing, failing and stability.

Different materials have different expressional impacts. As in Smithies (1981, p.23), different textures produce different perceptual and expressional feelings. Sharp edged orielis seem lighter than those with rounded corners. Different colours can suggest variations in warmth.

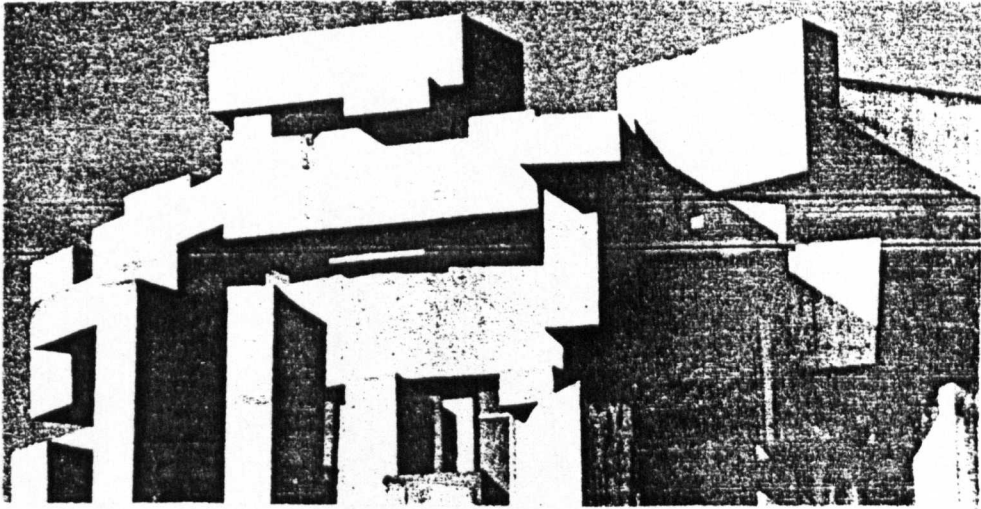


Fig. (5.5). Expressional architecture and Cubism.
Church of the Holy Trinity, Vienna, Austria, 1965-76.

(Source: Drexler, 1968, p.50.)



Fig. (5,6). Expression and Function. The Greek group of vessels suggest different expressive moods although they share one function.

(Source: Arnheim, 1977, p.257.)

It has been argued that the expression of a building is a direct reflection of its function. However, in exceptional cases, according to Smithies, "Function does not have a direct effect upon expressiveness in quite the same way. A fortress or a bridge indicate their function, but an office block, a hotel or a hospital may be similar in size, form and fenestration".¹⁴ According to Arnheim (1977, p.270), a program of abstract qualities such as Library is difficult to express visually.

A very important aspect of expressiveness is its quality of spontaneity. A teapot, as Arnheim indicates, can show us a great deal of spontaneous expressiveness as its main functions of containing and pouring are grasped visually through its expressional and perceptual shape. The chair of Mies Van Der Rohe in Barcelona and the grandstand of Pier Luigi Nervi are another two good examples in which functions are expressed clearly in such a spontaneous readable way.¹⁵

It was argued that architecture should express its structure lest it fall into the sculpture category. According to Hesselgren (1969 p.257), Le Corbusier's chapel at Ronchamp, France and the Sydney Opera House, are two great works of art on an architectural scale.

A plan's shape can play an effective role in evoking a particular desirable and expressional feeling. According to Simonds (1961, p.92), a humble man seeks protection by orientating his praying place whether it be a mosque or

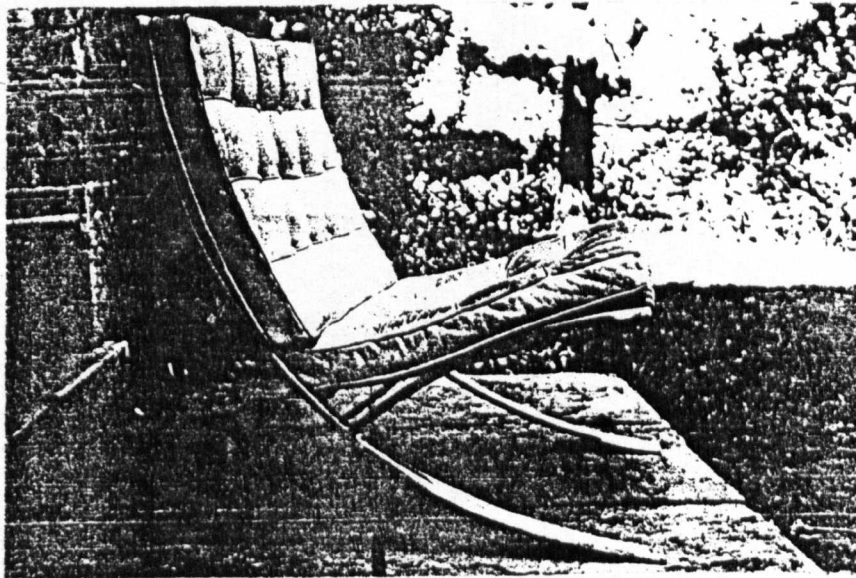
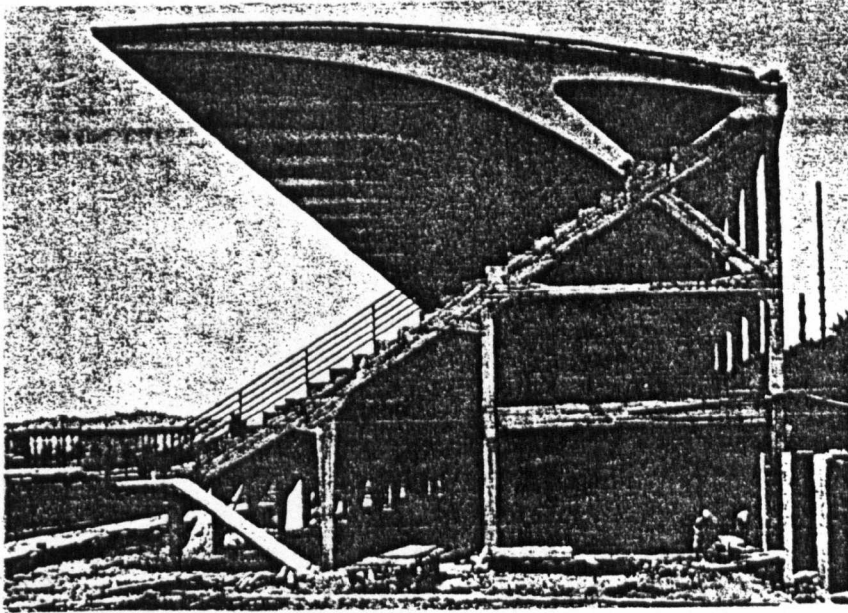


Fig. (5.7). The spontaneous expression. P. L. Nervi's grandstand of Florence Stadium and Mies van der Rohe's chair in Barcelona display their function in such a clear and spontaneous way.

(Source: Arnheim, 1977, pp. 264, 266.)

church towards the god as a superior power.

Every category of building should have its own expressional and spatial character, except those in which their functions are of abstract mood. A cemetery, as Simonds says:

Might well suggest peaceful quietude in terms of soothing muted colours, subtle harmonies of texture, soft rounded forms, horizontal planes, still water, ethereal and the evanescent. 16

5.2 THE SYMBOLISM ASPECT

It was argued that architecture has a language by which its style can be recognised. As in Park (1968, p. 15), "composition is as characteristic of a style as its details; it unites the details in a system which may, with a stretch of the imagination, be compared to a language".¹⁶ As a language, Architecture can be grasped through its symbolic composition in which its different parts with their variety of symbols and meanings are combined together to symbolise a definite state of affairs.

The work of Art has been considered as a concretising symbol. As in Schulz, "We have to consider the work of Art as a concretising symbol, which has to be described through a complete semiotical investigation of the objects making up its pole-system".¹⁷ Art is a media by which values of objects are symbolised. As in Argan (1969, p.23),

The idea of the monument (during the Roman period)

was typically humanistic; the monument was a building which expressed and symbolised historical and ideological values of great moral importance for the community. 18

The Colosseum of ancient Rome is a worthy member of a group of buildings, given that its size, location and the solemnity of its form caused it to establish for itself a dominant role in the context of the city, as it became the focal point of Rome's urban perspective.

The church of Santa Maria Del Fiore in Florence is another good example of a symbolic meaningful architecture which is of great cultural value for the city of Florence and its surfaces. As in Argan (1969, p.23),

Alberti, another humanist who was extremely sensitive to the historical-symbolic meaning of architecture, pointed out the new ideological value expressed by the dome (of Santa Maria Del Fiore) and praised it for its vastness which enabled it to cover 'with its shadow' not only Florentine people, but also 'all the Tuscan people'. 19

In general, architectural form during the Renaissance was treated skillfully in symbolising the ideological values of the community,

Symbolism as an artistic movement, started in the 1880's. According to Goldwater (1979, p. Introduction), "It can be described as a reaction against naturalism which took on its classic form in about 1870".²⁰

Symbolism as a prevailing philosophy relies on such powerful and meaningful symbols, which, on seeing them, starts a person's mind operating within a range of probabilities in order to find out the right answer for the given message.



Fig. (5.8). Symbols of different objects. Starting from number one as follows: Baggage lockers; drinking water; telephone; information and station restaurant.

(Source: Kepes, 1966, p. 108.)



INFORMATION

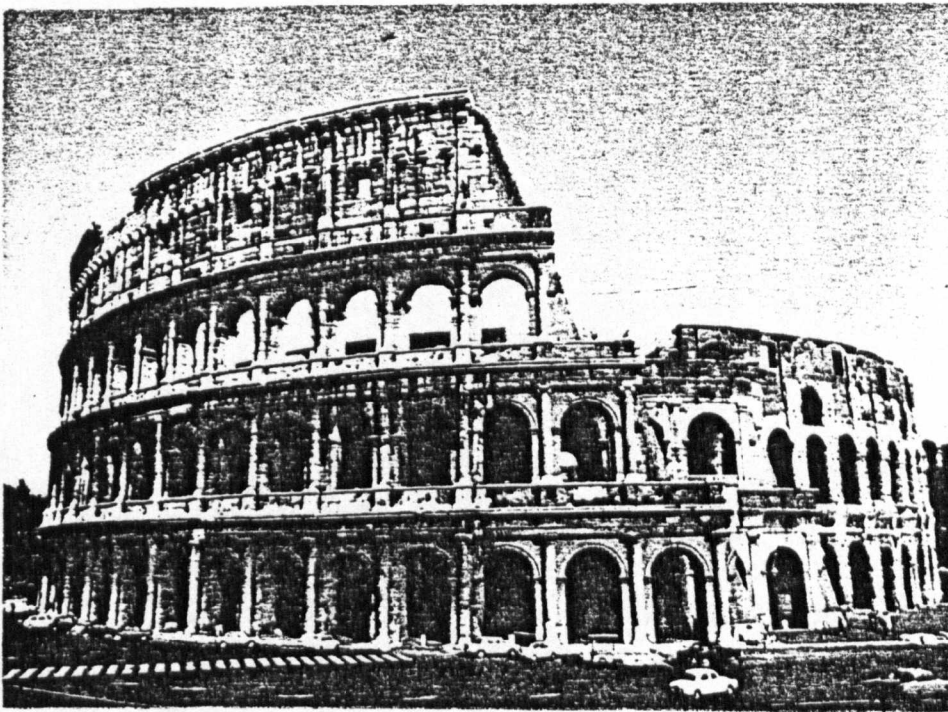


Fig. (5.9). The Colosseum of Rome. The symbol of its public value.

(Source: Léprohon, 1977, p.23)

An effective symbol has specific qualities. According to Smith (1974, p.51), "A symbol of real significance has a poetic quality. By economy and compression it draws the mind to a level of perception concealed behind the normal presentation of environment".²¹ A true symbol as Smith indicates performs a function similar to that of a catalyst in a chemical reaction in which two chemicals interact together without the catalyst itself undergoing any change.

Symbols, as in Langer (1951, p.60), "are not a proxy for their objects, but are vehicles for the conception of objects".²² Symbols, as in Smith's description, operate as a pointer to a level of meaning beyond itself.

Symbols (Kepes 1966, p.236), have been given different terms such as image, sign, symbol and emblem.²³

The most powerful symbols (Arnheim 1977, p.209), "derive from the most elementary perceptual sensations because they refer to the basic human experiences on which all others depend (like sun, sea and moon etc.)".²⁴ According to that, one would be able to say that understanding symbols relies on our previous experience and the level of our knowledge within a certain culture.

Symbolism (Arnheim 1977, p.207), begins to come into action when a conventional meaning is associated with a building's design. Symbolism as a concept has been grossly misused in our century as there is no standardised meaning for the term.

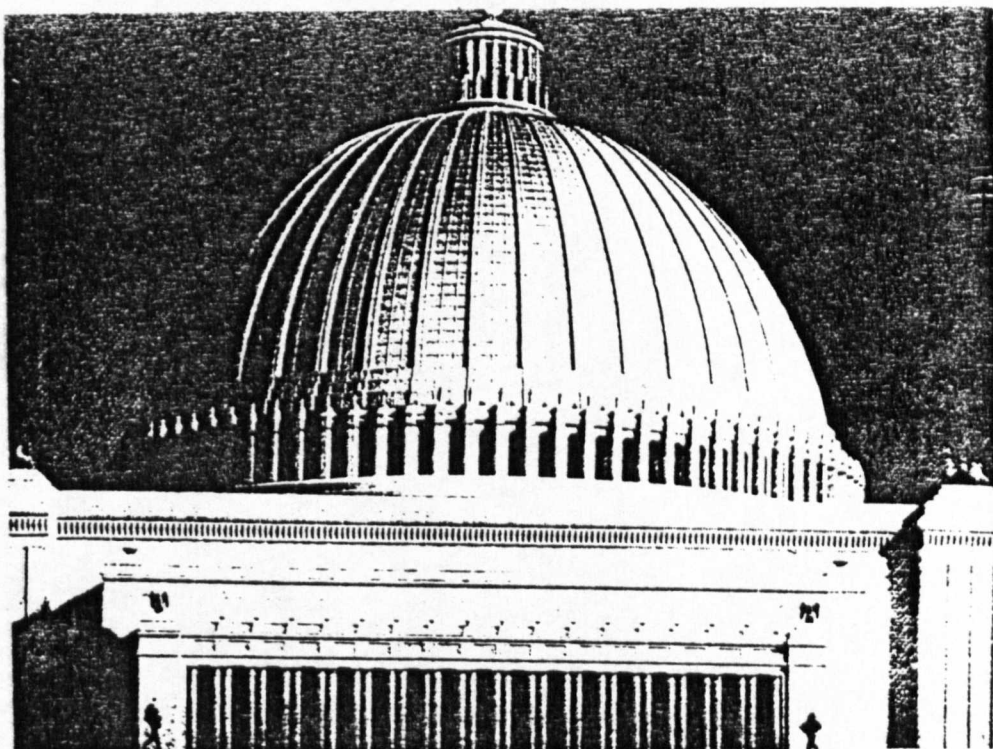


Fig. (5.10). The Power of Germany. Speir's Grand Domed Hall. for the German Empire is a symbol of its power which Hitler wished to see everywhere.

(Source: A.D. Vol. 49, No. 8-9, p.38.)

Certain aspects of symbolism communicate by analogy. As in Schulz (1963, p.59), "Symbolisation means a representation of a state of affairs in another medium by means of structural similarity".²⁵ The 'Symbolism of analogy' was termed differently by Arnheim as the 'spontaneous symbolism' in which perceiving the objects relies on their inherent expression. The T.W.A. air terminal by Eero Saarinen is a good example of spontaneous symbolism aspect in that its form looks like that of a bird.

The most powerful type of symbols are those which are of a metaphoric mood. According to Smith (1974, p.51), "The most effective symbols are imprecise, sparse and open ended, tending more to the metaphore than the simile".²⁶ As in Arnheim (1977, p.209), symbols cannot depend solely on the expressive qualities of sensory experience if that experience were not provided with metaphoric overtones in the experience of daily life. The sun is perceived as a giver of life: through its light the world is exposed to us; hence we consider it as a powerful symbol. A person watering his plants might become insane if he discovers that there is no connotation of offering refreshment to the thirsty. Etienne-Louis Boullée's proposal for placing the prison entrance of a law court underneath the bulk of the building shows a clear achitectural example of a metaphorical mood. The interpretations of Boullée's idea are summarised in the following statements by him:

By presenting that august edifice as elevated above the dark cave of crime, it seemed to me that I could

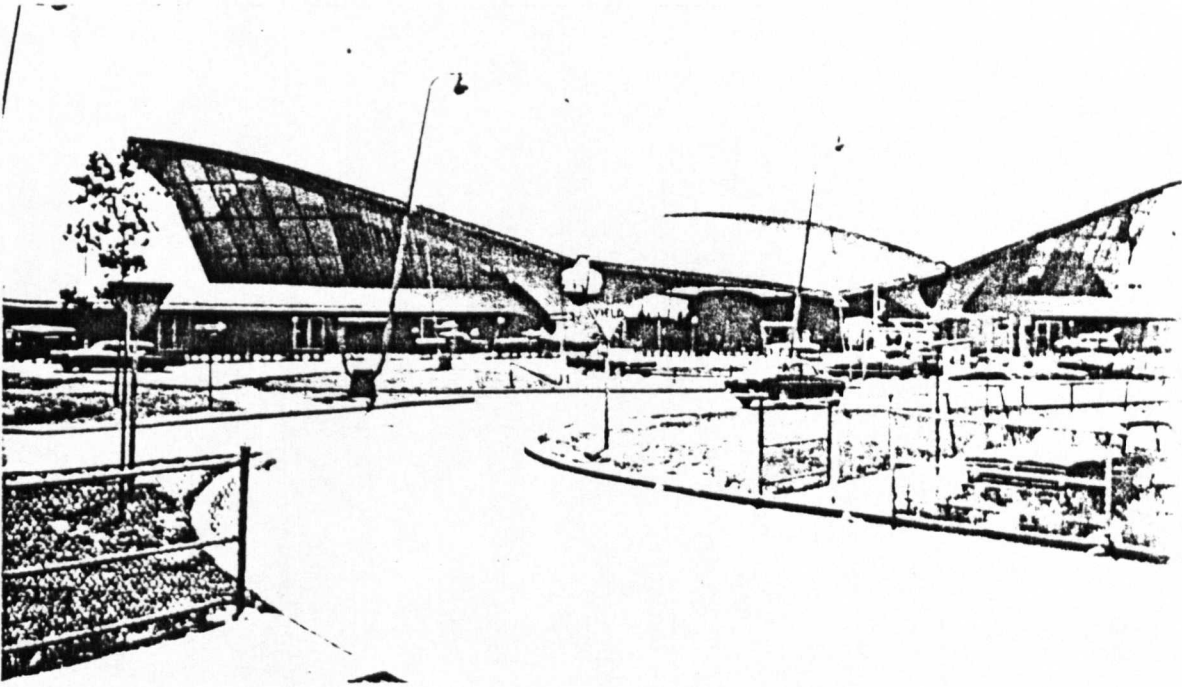


Fig. (5.11). TWA Terminal. An example of spontaneous symbolism, as the building looks like a bird.

(Source: Hesselgren, 1969 p. 205)

not only emphasise the nobility of architecture, by the resulting contrast, but also offer metaphorically an imposing picture of vices crushed under the load of justice. 27

Quantifiably, symbols help to reduce the impact of an impression to manageable proportions. Symbols are a source of energy, generating a psychological spark similar to an electrical circuit.

The fields of symbolism have been categorised by Smith (1974, p.52), into four types. These fields are:

- a. associational symbolism; b. accultured symbolism;
- c. symbolism of the familiar and d. the archetypal symbolism.

5.2.a. THE ASSOCIATIONAL SYMBOLISM

There are two factors which build up this aspect of symbolism. These factors are: personal experience and the place of the environment in which this experience took place, such as the symbolism associated with the place of childhood.

5.2.b. THE ACCULTURED SYMBOLISM

This field of symbolism is connected with the cultural influences upon the individual within a particular society. 'Big Ben' for the British is a national symbol. Were it to be destroyed the feelings of British Society would be shaken and hit at the same time. The church of San Peter, as in Argan (1969 p.98), is a symbol of the Christian religion in Europe. Similarly, Rome has been recognised as a model of a political and powerful city.

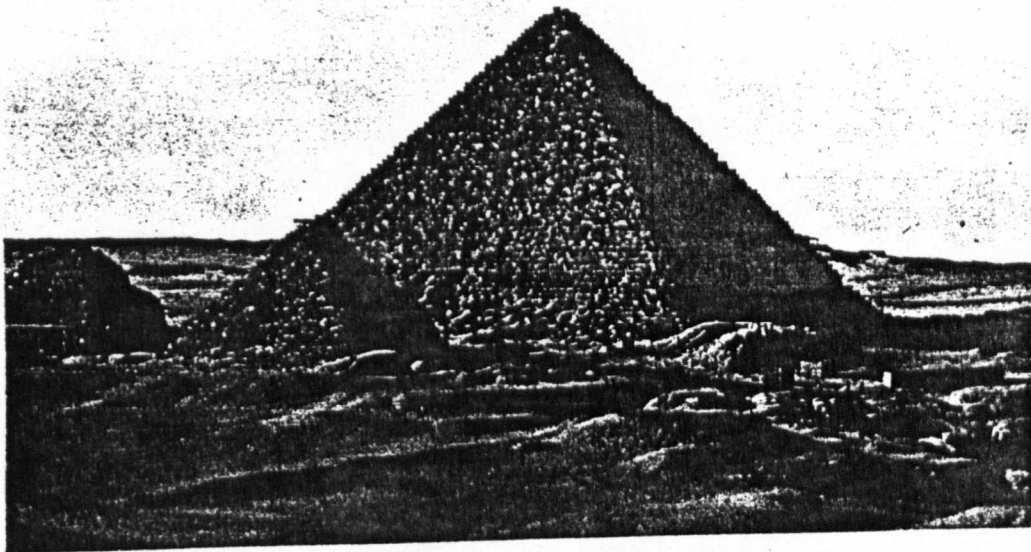


Fig. (5.12). The Pyramids of Giza, are a symbol of Egypt.
(Source: Barocas, 1973, p.22.)



Fig. (5.13). The Church of St. Peter in Rome. A symbol
of the Christian religion in the whole world.
(Source: Smith, 1974, p.214.)

5.2.c. THE SYMBOLISM OF THE FAMILIAR

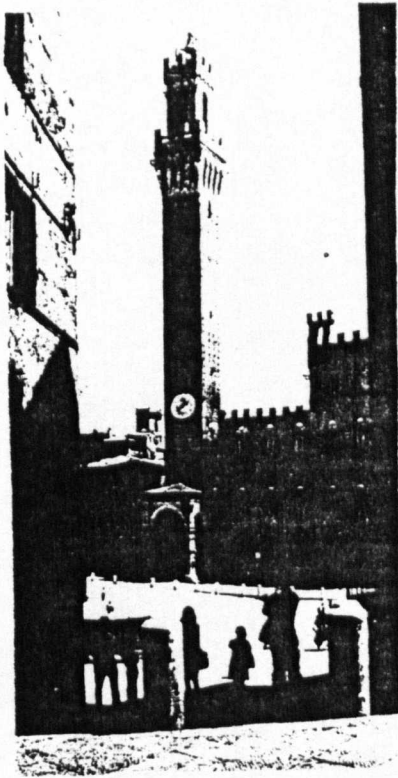
Maintaining and preserving historical buildings is of great concern in this field. One importance of historic objects, as Smith indicates, is that they put the individual in a much wider context, than immediate reality. Hence they symbolise the continuity of the main stream of life.

5.2.d. THE ARCHETYPAL SYMBOLISM

Jung's theory (Smith 1974, p.56), states that certain symbols represent an archetypal human situation, and such symbols have their roots deep in prehistory. The potency of these symbols remains unimpaired even if there are attempts to exclude them from the human consciousness.

The symbolism of Archetypes has different and important aspects which can be applied in the urban design field. According to Smith, these aspects are: sacrifice, order, water, image of power and finally identification.

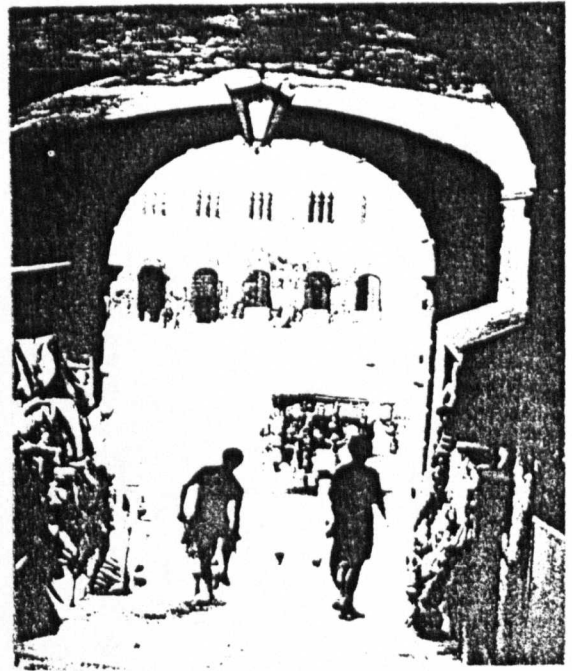
According to Kepes (1966, pp.237-38), the most powerful and universal symbols are associated with cities. Berlin and Moscow are two cities which symbolise power. Jerusalem and Mecca are symbols of holiness or faith, etc.



2

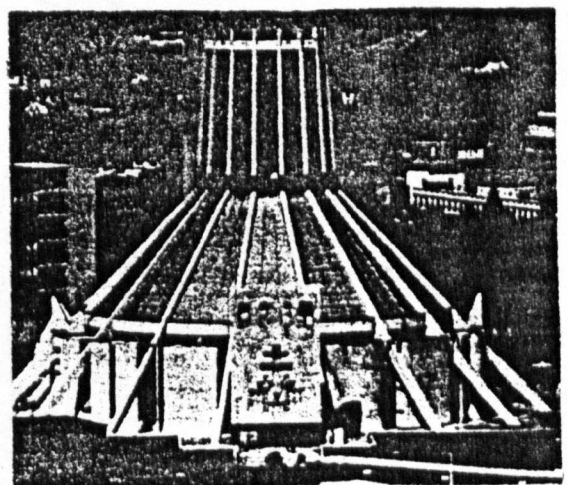
Fig. (5.15). Liverpool Anglican Cathedral. A place where man meets God. An aspect of the symbolism of the Archetype.

(Source: Smith, 1974, p.61)



1
Fig. (5.14). Access to the Piazza del Campo in Sienna. The movement through the tunnel in 1. and the canyon in 2. to get access to the Piazza is an aspect of sacrifice by which we experience latter freedom and light.

(Source: Smith, 1974, pp.64-5)



5.3 THE ASPECT OF CHARACTER

According to Grillo (1975, p.20), character in buildings as in men is a rare quality. If it does exist in a building, it would doubtless place it in a special rank apart from the crowd of style-mongers and fashionable cliché-followers who have always made the majority of our yearly architectural crop.

As Grillo indicates there are two aspects of character which buildings can take.

1. It can be the result of an incredibly exact fulfillment of a programme, by which it can possess what it might be referred to as "the group-character of a building type" such as school, hotel, hospital, etc.

2. The second aspect takes place when a built entity asserts itself over any limitation of a group building type, the thing which makes it difficult to judge by already known values. That type of building has an incredible impact on its environment - it lays claim to programme and site with such authority that it would be difficult to envisage the same site without it. Lower Manhattan is an example of this aspect.

The building's character is a representation of a set of ideological values which have been maintained within a certain culture or a certain age.

The character of man can be read through his face but a building's character can be read through its plan

Fig. (5.16). Lower
Manhattan from Brooklyn.
An architecture of
supreme character.

(Source: Grillo, 1975,
p.20.)

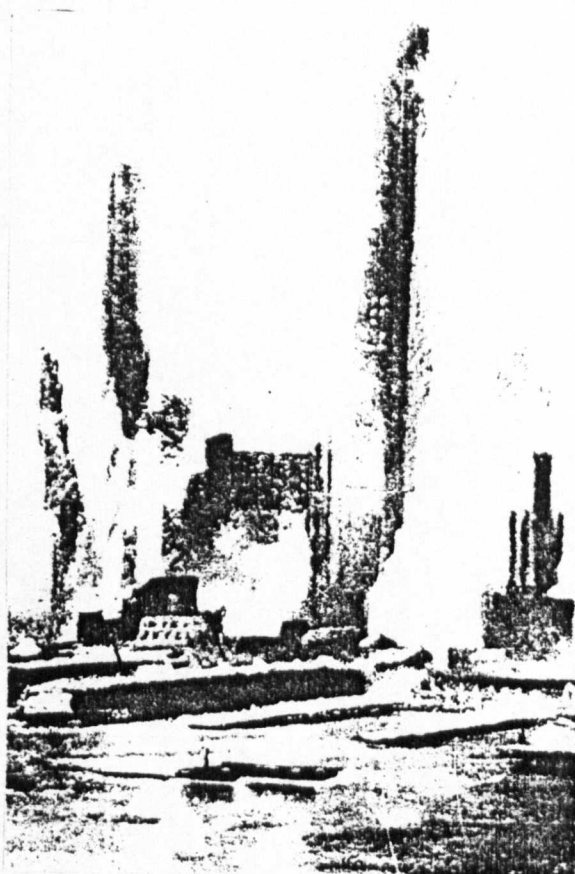


Fig. (5.17). The German
pavilion, Paris World
Fair, 1937, in which the
glories of power as a
German character was
displayed.

(Source: Grillo, 1975,
p.21.)



and its elevation. As we consider the importance of the building's plan as a medium by which its character can be revealed, we find that the plan itself can be divided and classified into three categories in which each has a special character. As in Grillo (1975, p.22),

The kind of government that rules a society is revealed even more clearly in plans than in facades. The three examples shown here represent master works from the three characteristic types of government: 1. The mysterious and absolute ruling of a deity - or theocratic government. 2. The theatrical display of power and total symmetry that is the expression of a dictatorial government. 3. The wandering fun and freedom of the individual that make a democratic government so dear to our hearts. 28

Extrovert and introvert are two concepts on which the character of the building and its design is based. A building whose main views and elevations are looking outward can be considered as a representation of the extrovert concept. Conversely a building whose main views are inward represents the introvert concept.

The character of a city and the values of its society can be reflected in its plan and in its visual organisation. As in Simonds (1961 p. 127), the design of Washington city, by its monumental plan, spaces, architecture, sculpture and all other visual arts, should epitomize the glorious idea of the democratic city.

The political circumstances during the Renaissance period have affected the character of the city and its design technique. According to Argan (1969 p.106), "The ideal city always originated at the behest of an

Fig. (5.18). Habu Temple.
An aspect of theocratic plan in which the awesome inner sanctum is protected by the successive enclosures of the armored walls.

(Source: Grillo, 1975, p.22.)

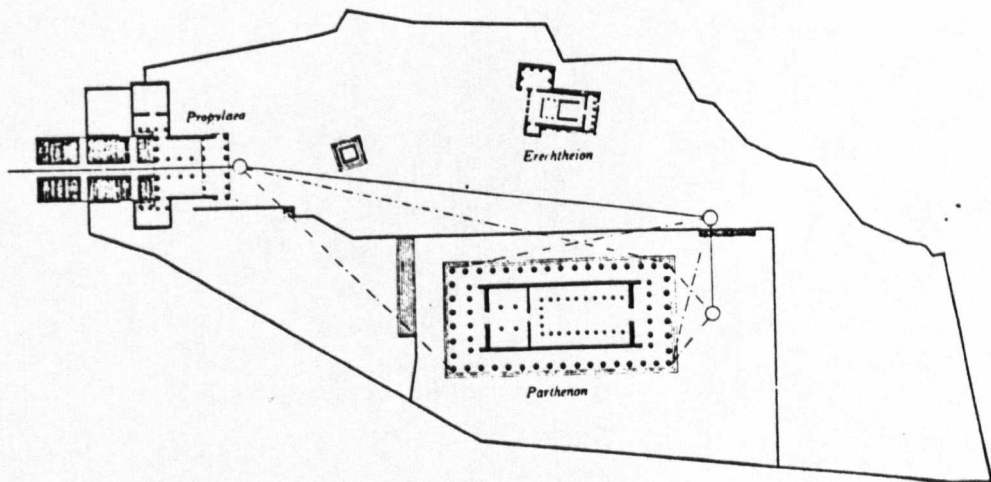
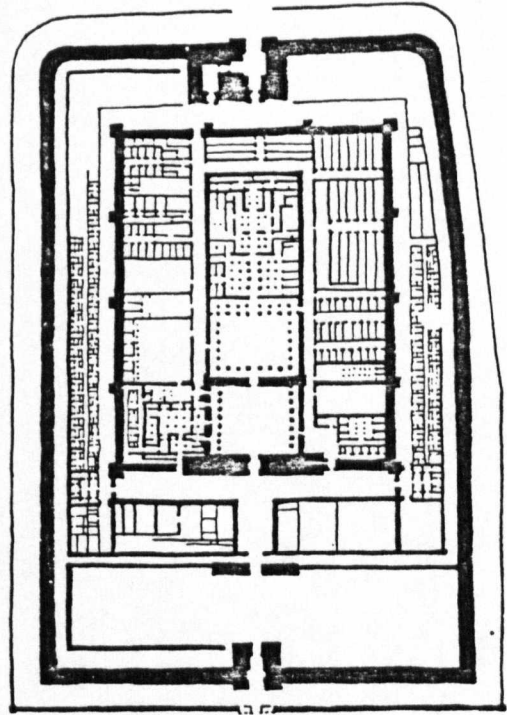


Fig. (5.19). The Acropolis of Athens. An aspect of plan characterised by freedom, respect of nature and democracy.

(Source: Grillo, 1975, p.22.)

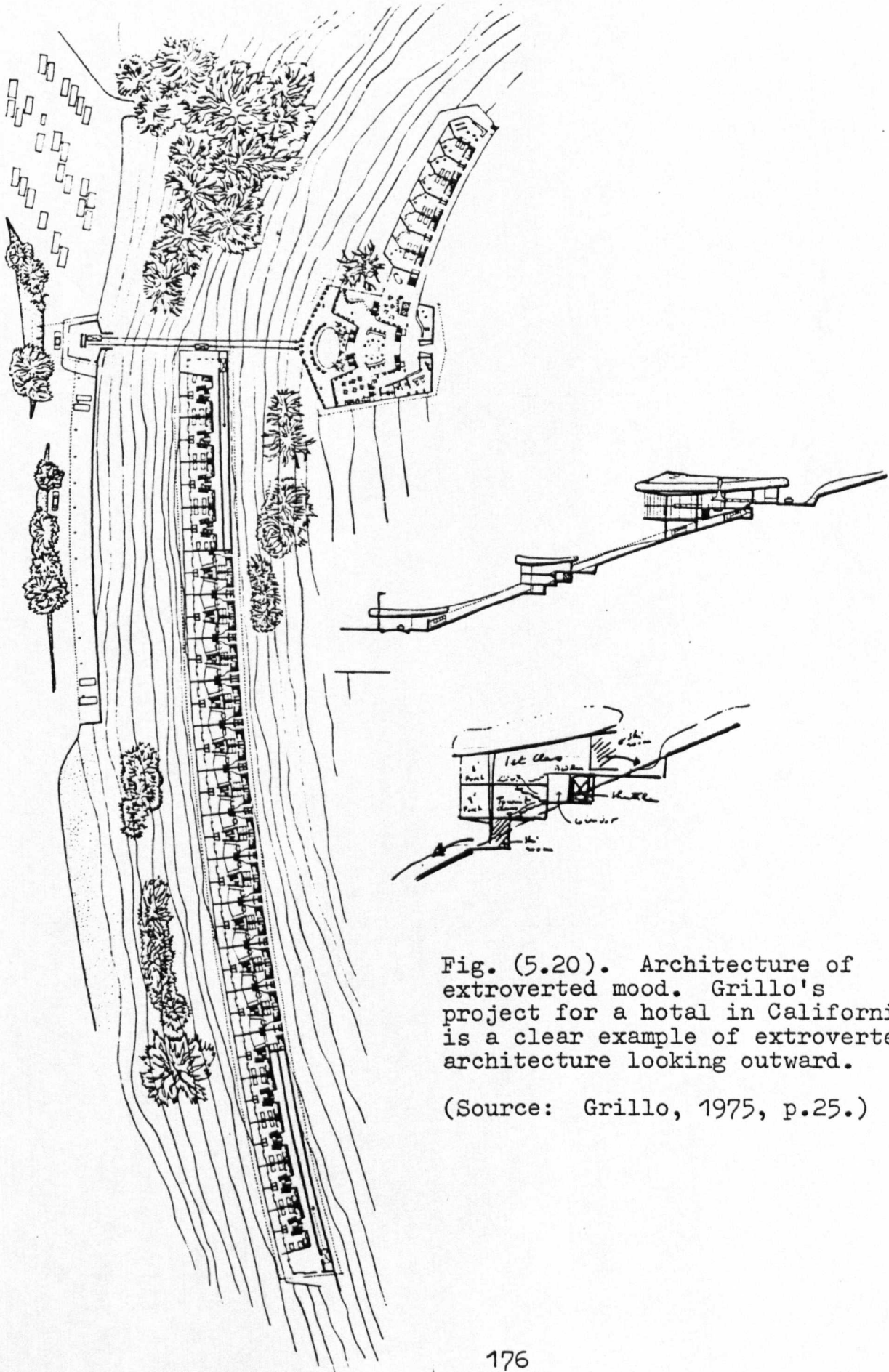


Fig. (5.20). Architecture of extroverted mood. Grillo's project for a hotel in California is a clear example of extroverted architecture looking outward.

(Source: Grillo, 1975, p.25.)

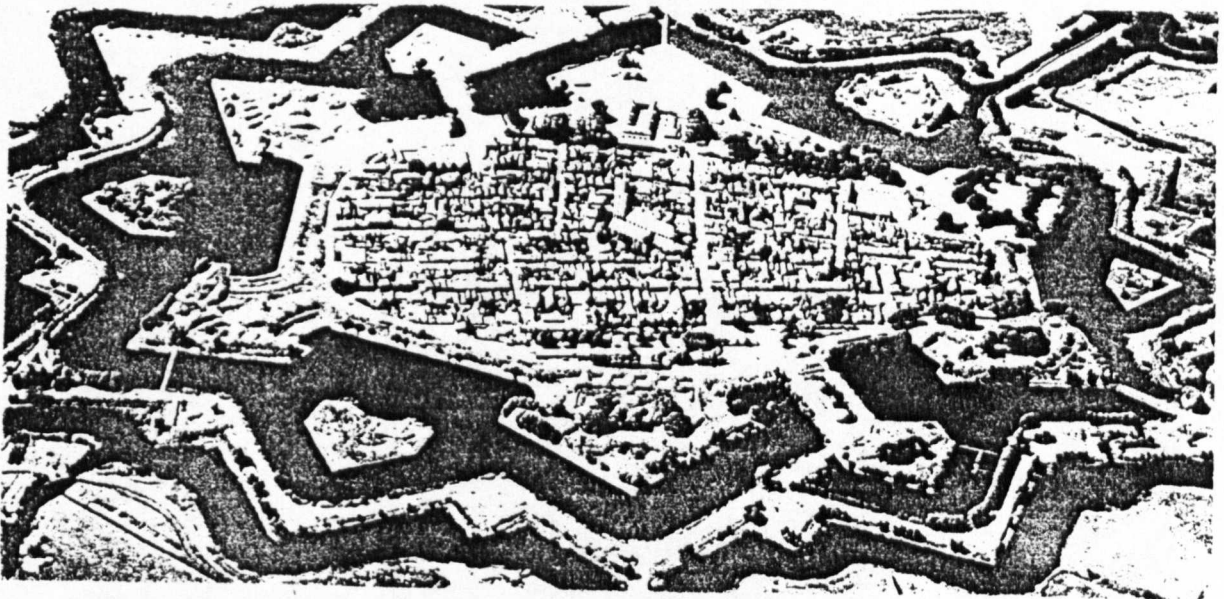
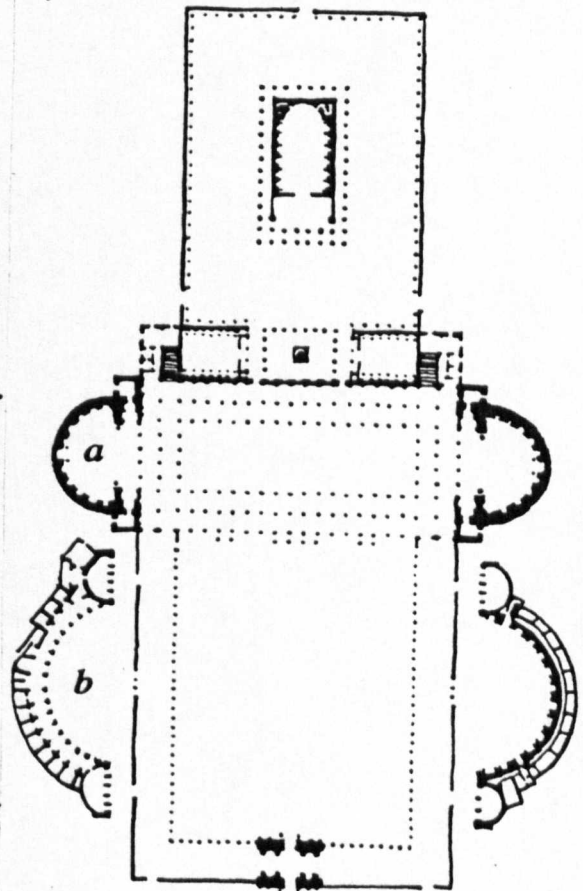


Fig. (5.21). The city of Naardan, Holland. A defensive city which was commissioned by an arbitrary ruler. It is an example of an introverted plan.

(Source: Grillo, 1975, p.24.)

Fig. (5.22). The Forum of Trajan. As aspect of dictatorial architecture which was also commissioned by an arbitrary dictatorship.

(Source: Grillo, 1975, p.23)



absolute ruler - a sovereign. It was founded on the desire of power; and the desire of power inevitably translates itself into the potential of war".²⁹

A building which has been given a monumental character influences a large part of the city. As in Argan (1969 p. 29), it tends to modify the layout in order to let itself clearly be visible and easily accessible from different directions. Being bigger than the others, those buildings which are of monumental character require streets, open spaces and squares of large scale to match their size and dimensions.

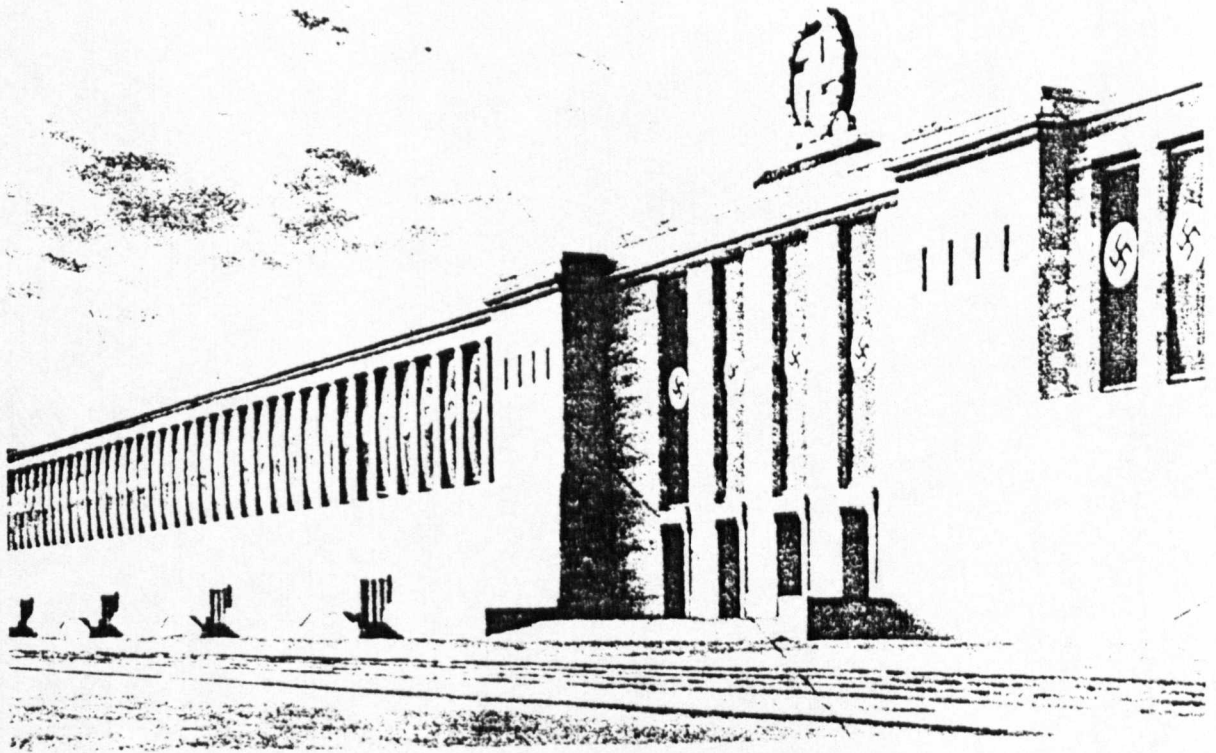


Fig. (5.23). Architecture of War. Zeppelin field in Munich, designed by Speer, shows an example of the German architecture which was characterised by monumentality and brutality during Hitler's regime.

(Source: A.D. Vol, 49, no. 8-9, p.36.)

CHAPTER 5 NOTES & REFERENCES

- 1 Hessegren, Sven, The Language of Architecture (Applied Science Publishers Ltd., London, 1969), p.252.
- 2 Lampugnani, Vittorio, M., Visionary Architecture of the 20th Century, (Thames & Hudson Ltd., London, 1982, p.8.
3. Ibid., p.9.
- 4 Sharp, Dennis, Modern Architecture and Expressionism, (Longman Green & Co. Ltd., London, 1966), p.11.
- 5 Drew, Philip. Third Generation, The Changing Meaning of Architecture. (Pall Mall Press Ltd., London, 1972), p.45.
- 6 Ibid.
- 7 Maly and Dietfried Gerhardus, Expressionism, (Phaidon Press Limited, 1979), p.11.
- 8 Benton, Tim, Expressionism (The Open University Press, 1975), p. Introduction.
- 9 Tafuri, Manfredo & Dal Co., Francesco, Modern Architecture, (Academy Editions, London, 1980), p.162.
- 10 Drexler, Arthur, Transformations in Modern Movement, (The Museum of Modern Art, New York, 1980), p.48.
- 11 Smithies, K.W., Principles of Design in Architecture, (Van Nostrand Reinhold, London, 1981), p.22.
- 12 Ibid., p.23.
- 13 Arnheim, Rudolf, The Dynamics of Architectural Form. (University of California Press, 1977), p.253.
- 14 See Smithies, K.W. ibid., p.29 and Arnheim, ibid., pp.254-70.
- 15 Arnheim, ibid., 1977, p.264-67. Simonds, John, Landscape Architecture, (London, Iliffe Books, Ltd., 1961), p.92.
- 16 Park, Niels, L., The Language of Architecture, A Contribution to Architectural Theory, (Mouton, The Hague, Paris, 1968), p.15.
- 17 Schulz, Norberg, Intension in Architecture, (Universitetsforlaget. Allen & Unwin Ltd., 1963), p.68

- 18 Argan, Giulio C., The Renaissance City (Studio Vista, London, 1969), p.23.
- 19 Ibid.
- 20 Goldwater, Robert, Symbolism, (Allen Lane, 1979), p. Introduction.
- 21 Smith, Peter F., The Dynamics of Urbanism, (Hutchinson Education Ltd., 1974), p.51.
- 22 Langer, Sussan, Philosophy in a New Key (Oxford University Press, 1951, p.60.
- 23 Kepes, Georgy, Sign Image & Symbol, (Studio Vista, London, 1966), p.236.
- 24 Arnheim, *ibid.*, 1977, p.209.
- 25 Schulz, *ibid.*, 1963, p.57
- 26 Smith, *ibid.*, 1974, p.51.
- 27 Arnheim, *ibid.*, 1977, p.208.
28. Grillo, Paul J., Form Function and Design, (Dover Publications, Inc., New York, 1975), p.22.
29. Argan, *ibid.*, 1969, p.106.

PART 3

CASE STUDIES

SEVENTH HEAVEN 1 & 2

INTRODUCTION

This part contains the analysis of two case studies based on a scheme which was designed by the researcher as a part of the competition "Seventh Heaven" held in 1983 in Regent's Park in London. The first case study was the researcher's first submission in this competition and the second case was the researcher's second version of the same scheme which was designed later after declaring the competition's result. In the later case study the researcher tried to avoid the shortcomings which were raised through the analysis of the first scheme.

As the two case studies were a short exercise in architecture and in urban design, they were also a good chance in which the researcher tried to locate his creation in the right place within the theory of perception with its two aspects which have been explained earlier in the previous two parts. In other words the analysis will run in a specific direction in which the two schemes will be examined and analysed formally and perceptually; i.e. the analysis will try to reveal the abstract qualities of the forms used and their relation to the assigned function, and will try to reveal also the impact of these forms upon the human sensations and the limits of his intellectual ability which determines the mood of the

perceived phenomena.

It is remarkable to mention that the used limits of perception here in this argument, can be read in the end of Chapter 2.

6.1 SEVENTH HEAVEN 1

Seventh Heaven is a name used to identify the seventh piece of architecture which is expected to be added within Regent's Park in London. This Park was created five generations ago by John Nash. The main parts of this park are: the main avenue; Queen Mary's Garden; the lake; the canal; the zoo and the fields.¹

In order to get some new ideas and inspiration to facilitate designing the Seventh Heaven, a competition was held early in 1983. Students from all architectural schools in the U.K. were allowed to take part in this competition.

The researcher took part in this competition, so in the following pages we will be given an analysis of his two schemes, i.e. his first submission in that competition and his second and modified version which was prepared after declaring the result of the competition. As was mentioned earlier, the analysis will be an attempt to reveal the shortcomings and the potential of the two schemes, and their location within the perceptual context.

According to the competition's brief which has been published , the Seventh Heaven was intended to be a unique piece, entirely different from the existing pieces; however, this piece was expected to contribute to the park's completion . Seventh Heaven



Fig. (6.1). Regent's Park Main Elements.

In this map we can see the main elements of Regent's Park. According to the map these elements are:

1. The Avenue
2. Queen Mary's Garden
3. The Lake
4. The Canal
5. The Zoo
6. The Fields
7. The Seventh Heaven, 'The newly suggested element'

(Source: Prepared by the Researcher)

was meant to be an entertainment place within the park, where having good food, listening to music, watching theatrical performances and seeing sculptural displays in the open air, all can be enjoyed inside or outside the building in the external enclosure. The place was expected to comprise these spaces: an indoor restaurant, central space for different performances such as dancing, banqueting etc., a number of separate rooms for private occasions, two bars, kitchen, public utilities, an external protected enclosure walled in or partially walled in without roof to be used for outdoor sitting, a bandstand, sufficient storage space for furniture, and finally an open landscape area for sculptural display.

6.1.a THE PROPOSED LOCATION

Two locations were suggested to be the place on which the Seventh Heaven could be positioned. The first of the sites is located at the top of the right wing of the lake, and according to the attached map it was given number (1). The second site, numbered (2) in the map, lies between the two wings of the lake. Although the later site is organically more powerful, the researcher had a bias towards the former one being centrally easier to approach and to be seen from the whole park.



Fig. (6.2). Regent's Park, London.
In this map one can see the two suggested locations
for the Seventh Heaven.

(Source: Reproduced by the Researcher from the
competition documents.)

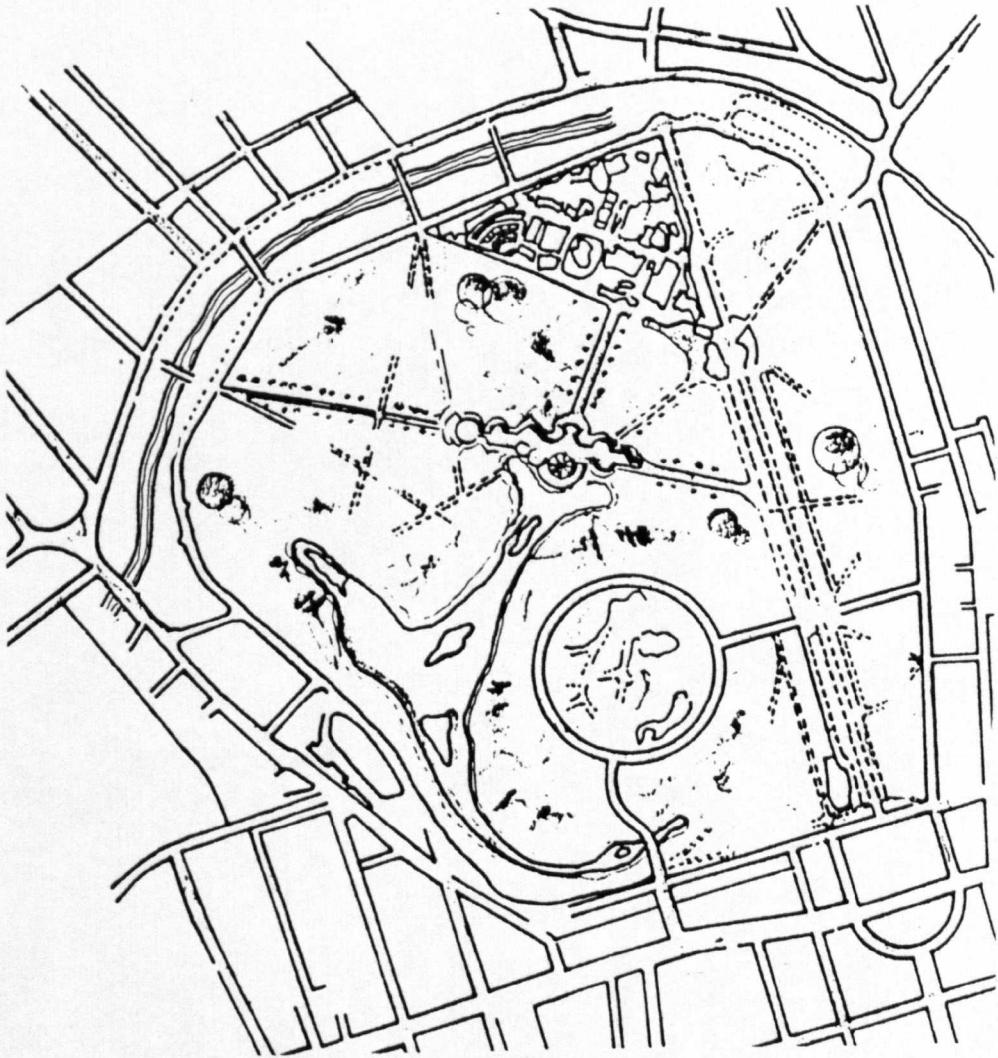


Fig. (6.3). The chosen location of Seventh Heaven 1.

(Source: prepared by the Researcher from the competition documents.)

6.1.b THE ENTRY'S DESCRIPTION

The scheme consists of two floors only; one of them slightly above ground level, and the other below it used as a basement for the kitchen. The ground floor has a Mezzanine which can be reached by a grand stair from the main entrance's hall. As we can see from the attached drawing, the ground floor has two straight forward wings and a centrally rounded enclosure covered by a shell. This floor contains different spaces for different activities such as dining, dancing, smoking, drinking, etc. It also has an outdoor open enclosure, which contains an open theatre and free landscape space for sculptural display. The scheme comprises a highly raised glazed tower containing a cafeteria and restaurant at its top. These places can be reached by lifts from the main restaurant hall in the ground floor. As the mezzanine level can be reached by a luxury rounded stair from the main entrance's hall in the ground floor as mentioned before; however this level can be reached also by other stairs from different places as we can see from the drawing. The mezzanine level comprises many spaces which are used differently as a restaurant, bar, lounge etc.

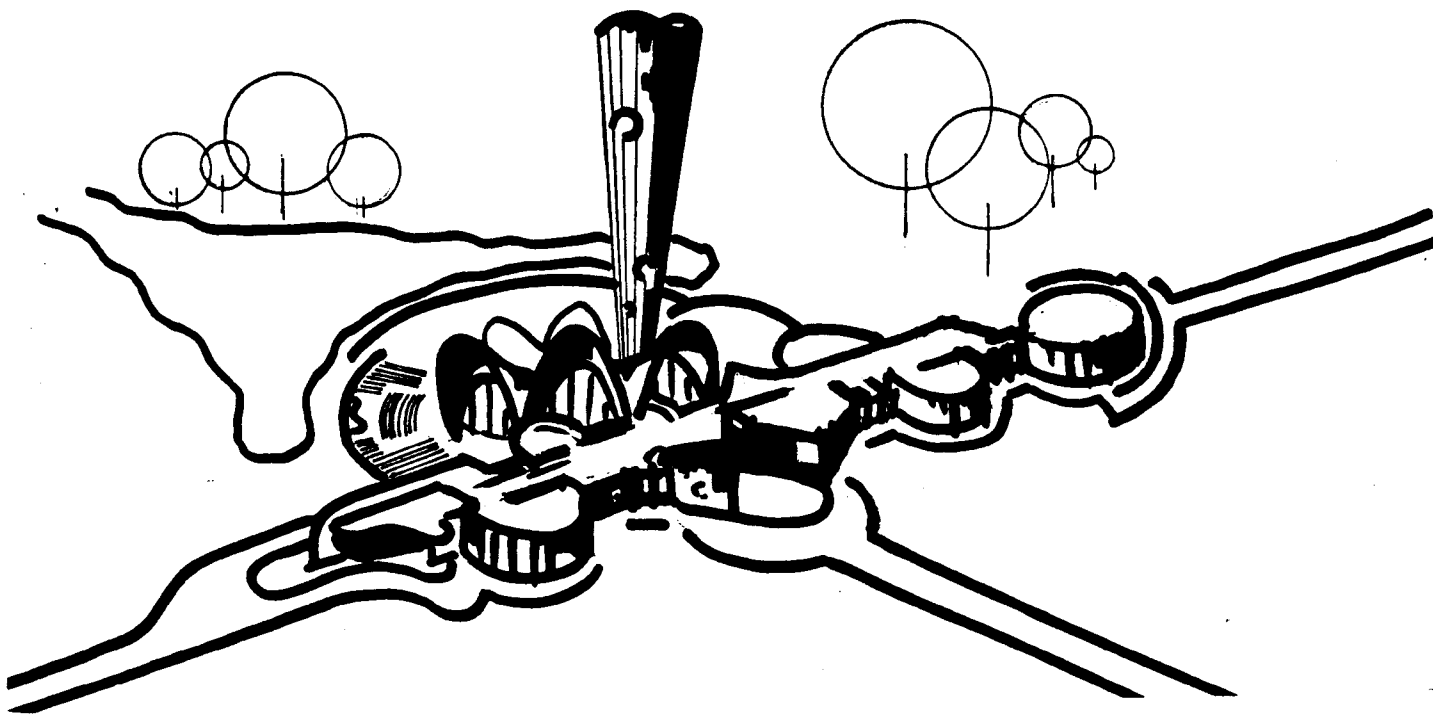
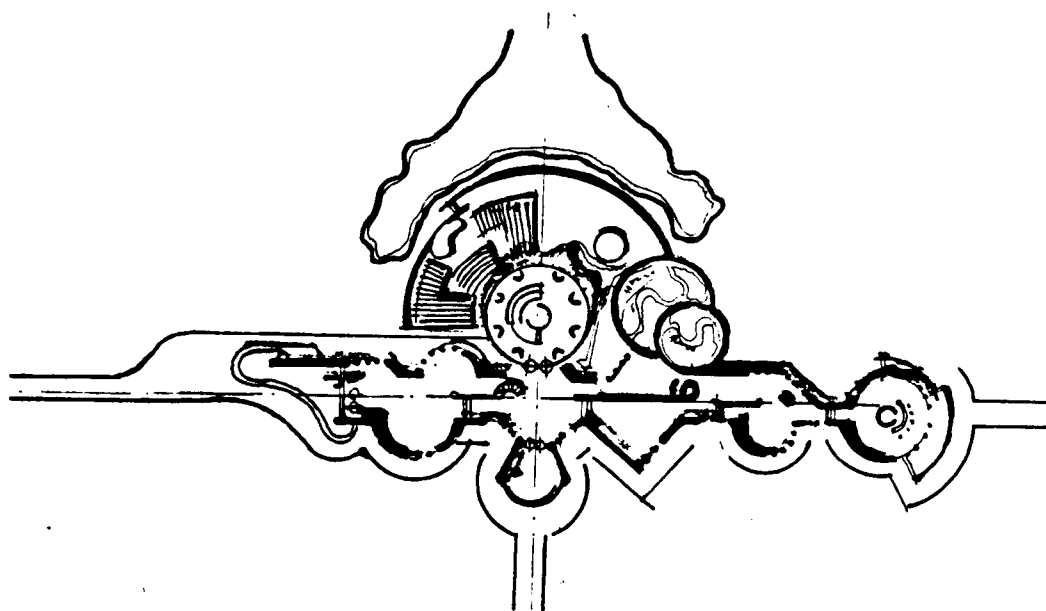
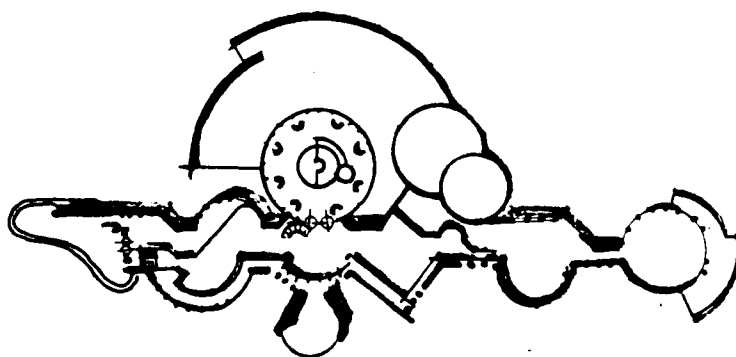


Fig. (6.4). An Aerial Perspective of Seventh Heaven 1.
(Source: Prepared by the Researcher.)



The Ground Floor



The Mezzanine Level

Fig. (6.5). Planes of Seventh Heaven 1.

In this illustration one is able to perceive a sense of organic lively and balanced self entity.

(Source: Prepared by the Researcher.)

Fig. (6.6). First Prize scheme by Alistair Philip, Bartlett School of Architecture.

(Source: RIBA Journal, June 1983, Vol. 90, No. 6, p.44)

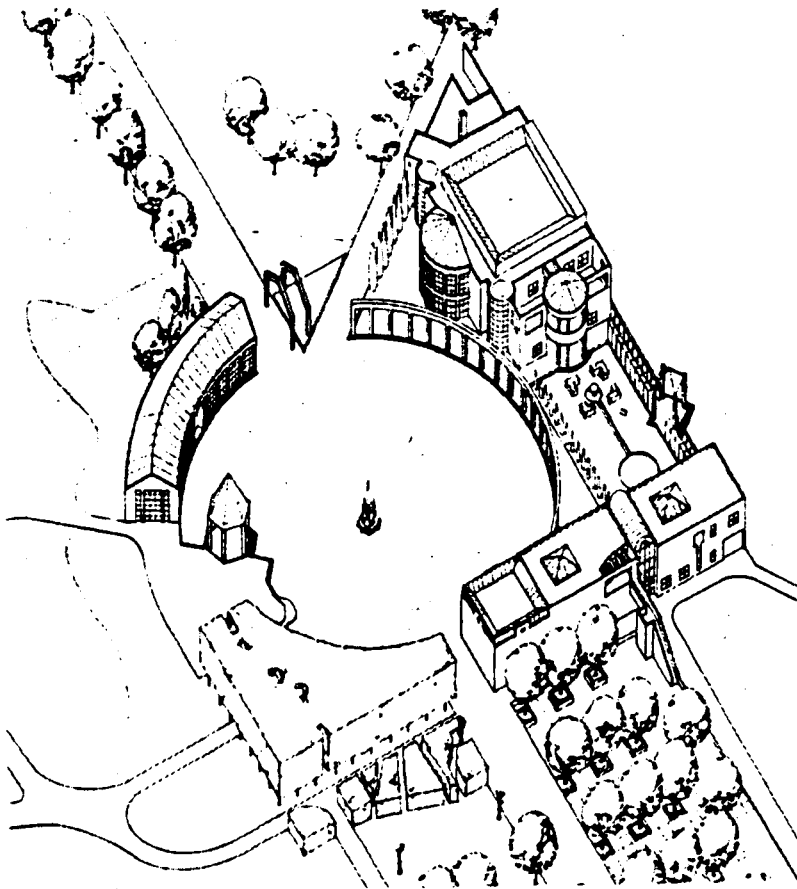
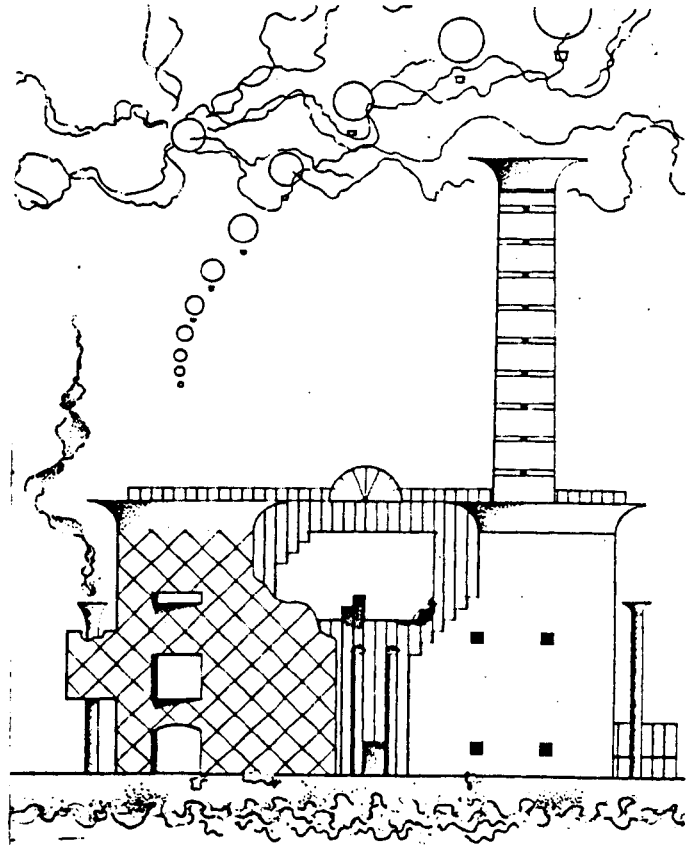


Fig. (6.7). Third prize scheme by Yuen Wai Weng, Architectural Association School of Architecture.

(Source, RIBA Journal ibid., p.45.)

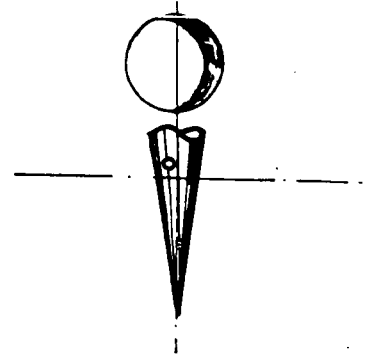
6.1.c THE SCHEME ANALYSIS

(i) The Form

The researcher intends to study here the entity of the different forms which constitute the overall organism. According to his research it was discovered that the scheme's form is composed of three different entities. The first of these entities is the part of the scheme which looks like a bird's wings. That part as we can see from the drawings is made up of different rounded enclosures running around a straight axis. The second entity is the shell, i.e. Candella's shell. The third of these entities is the tower. It was amazing to discover that these entities are working wondrously together in the plan, the thing which did not happen in perspective. The reason for that is the 'individualism's phenomenon' which characterised most of the connected parts in the total form. For further explanation, we can say that the shell for example, is considered to be an organic and a self unified form, which does not accept the unity with any other form. As for the chain of the horizontal constitution in the frontal elevation, one would be able to notice how much destruction it caused to the individuality and the self unity of the shell which is hardly trying to reveal itself in the back. But in relation to the tower's case the situation will



A. A form of clear self unity.



B. An ambiguous entity, although the cone claims a self unity for itself; however it accepts unity with other forms at the same time.

(Source: Prepared by the Researcher)

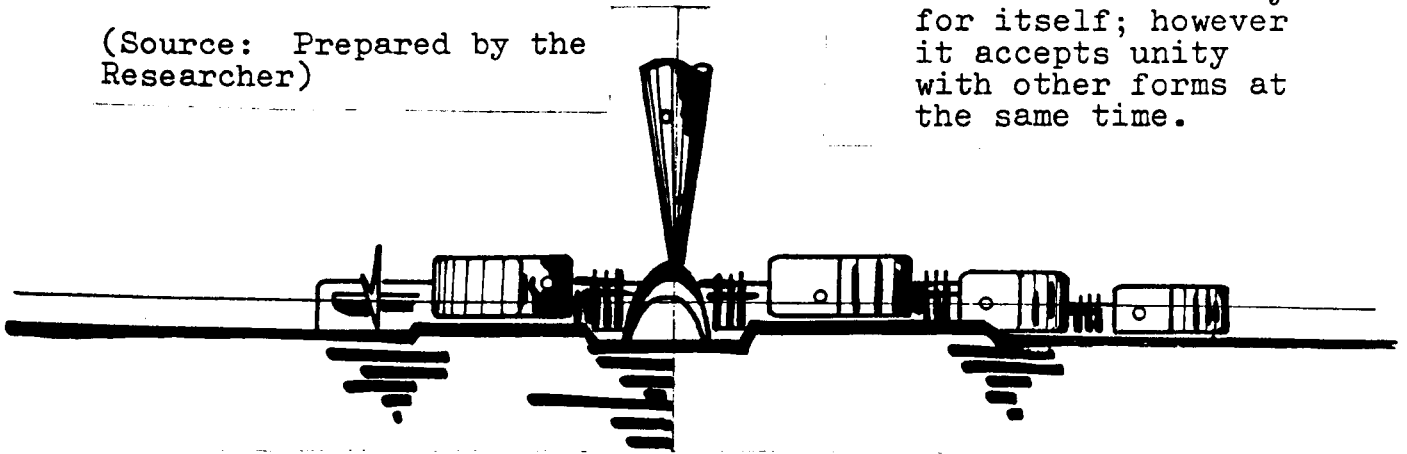


Fig. (6.8). The Seventh Heaven and the shell. Although the shell in this constitution has been omitted, the whole impression of the main elevation was not impaired.

(Source: Prepared by the Researcher)

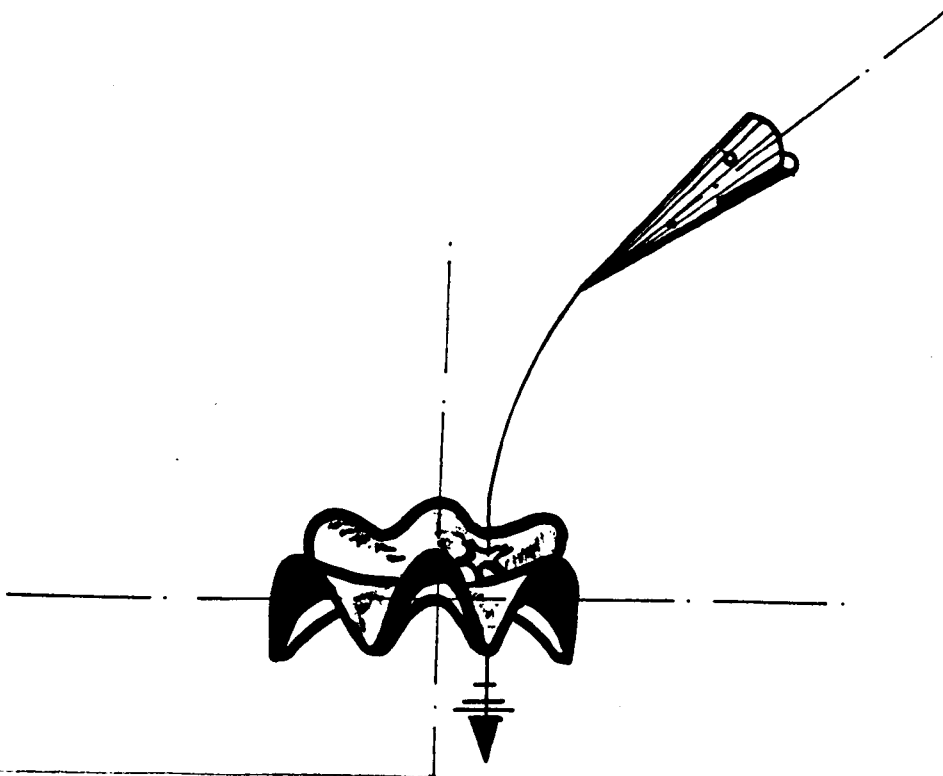


Fig. (6,9). The Tower and the shell. A relation of aggression and violation.

(Source: Prepared by the Researcher.)

not differ too much from the shell's situation. The only thing which can be added to what has been mentioned earlier, is that disrupting the tender membrane of the shell in order to give a place for supporting the tower is an illegitimate and visually unacceptable procedure. No doubt such things have destroyed and impaired the self unity of the shell. Now we arrive at the end of the discussion by concluding that the total form of the scheme consists of three different competitive entities. No one of them could manage to dominate the general situation. All have contributed in constructing a contradictory, conflicting and divisible form. All have destroyed our prospect for having a 'Gestalt whole'.

(ii) The Character

The character of the Seventh Heaven falls into the two categories of characters which have been identified by Grillo in the last part. It was discovered from the analysis that the scheme's features are more or less similar to the features of any other entertainment building which performs the same function. The freedom and the informality of its shape inevitably would induce within its percipient's mind a sense of cheerfulness, which in its turn would place it within the character of those buildings which serve as entertainment places. Also, this fact would make us understand the character

of its users and their identification as extroverted people. As for the scheme falling within the character of those buildings which are characterised by a special type of personality which makes them dominant in their environment, we can say that the reason behind this observation is the sensitive use of the glazed tower, which has risen gracefully on its tip to impart a sense of boldness, and to dominate the tranquil landscape of the park. The elevations of the scheme, being dominated by glass, allow a high amount of intrusion, and being its form, free, hugs, unfolds and interacts with its environment, makes a person predict its function and makes him get a special image about it. This image in its turn will build its character as a place for fun, gaiety and cheerfulness.

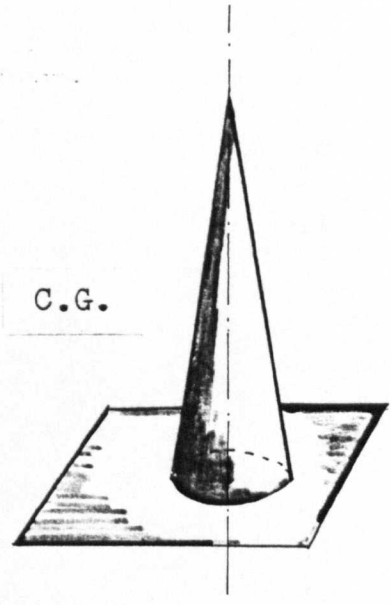
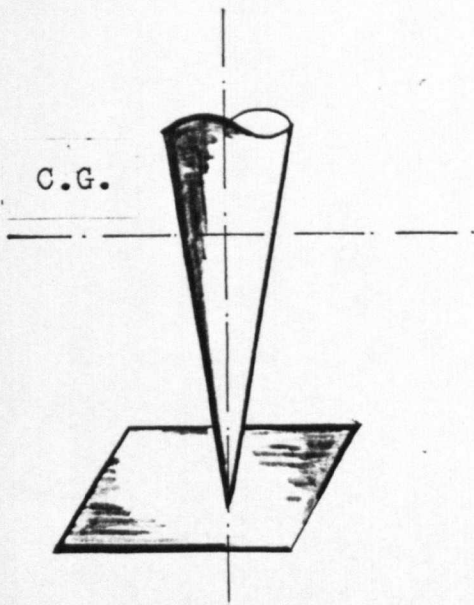
(iii) The Scheme's Expressiveness

As a result of my analysis which examines the relationship between function and the principle of expressiveness, it was proved that the scheme's form did not reflect and express its function in such a spontaneous way. That is because the function of the scheme consists of a group of abstract actions and emotional feelings which are difficult to express, such as eating, smoking, chatting, happiness and pleasure. But as was mentioned earlier, the building's function as an entertainment place can be conceptualised from its informal and free form. Apart from

the function and its impact on the scheme's look, the form and the materials used in the scheme possessed a certain expressional mood. For example, Candella's shell in the graceful way of its support on the ground, looks like a bird which is full of energy and has the intention of flying. The horizontality of the scheme's frontal elevation shows a great deal of quietness which has been interrupted suddenly by the irresistible power of the tower and finally using the glass in the whole composition has two expressional folds. On one hand, it produced a very light form and on the other it showed the consistency of its visual weight.

(iv) The Scheme's Lines

The lines which have been used in the scheme have a very important and expressional significance. Although using the combination of straight and curved lines has created an ornamental pleasing form, this combination has however, played a great part in establishing a visual and logical language, by which the visitor to the place can understand the content of every space. For greater explanation, whenever there was a chance of grouping people, the circle has been used, being characterised by the quality of 'containment', and whenever there was a chance of moving people from one place to another, the straight line has been used as in the corridor's case



B. Less Contact.
 Conversely the form of the cone here shows less contact with the ground where its center of gravity is far from it.

A. More contact.
 The form of the cone shows more contact with the ground where its center of gravity is near to it.

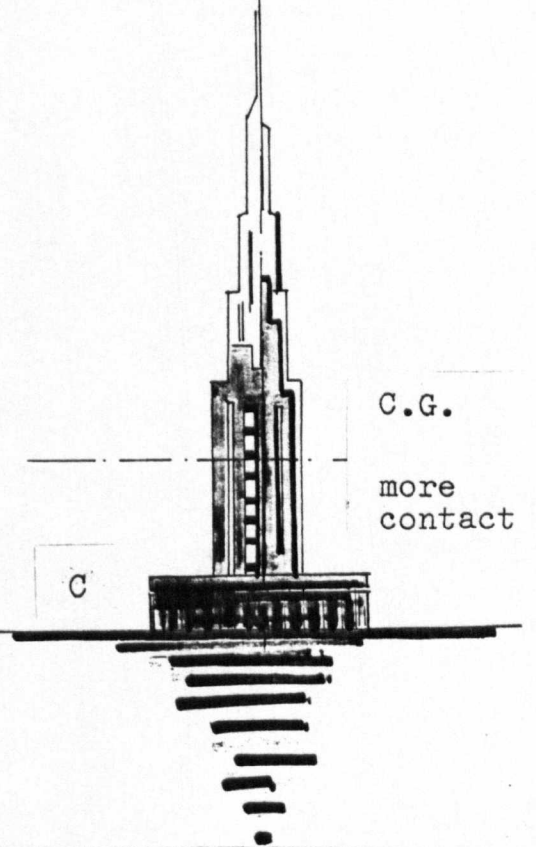
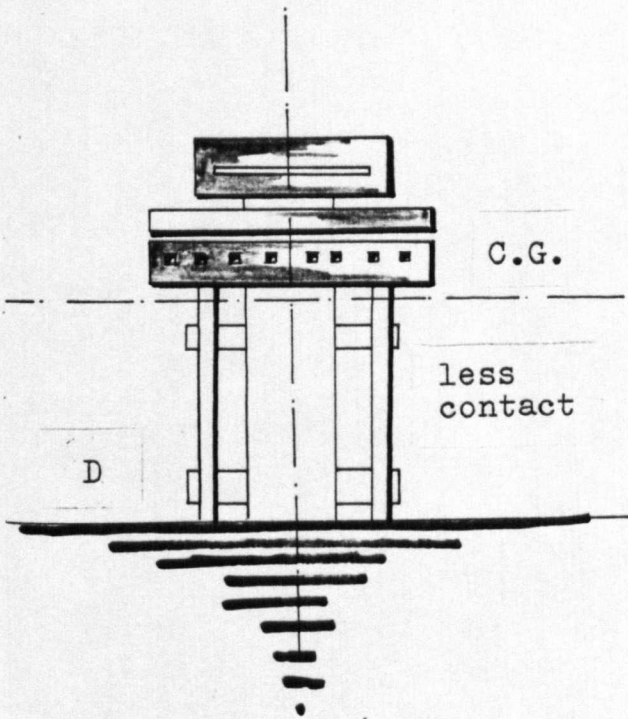


Fig. (6.10). The form and the perceptual visual weight.

(Source: prepared by the Researcher.)

where that line has been characterised by the 'straight forward uncompromising movement'. Of course, the use of this combination has contributed greatly to the establishment of the required loose and free form which is needed to match the soft and tenuous landscape.

(iv) The Potentiality of the Form

According to Grillo's equation of energy (1975, p. 173) which states that energy = Mass and Motion, it was discovered that the researcher's scheme is full of potential energy in an unbalanced form. This fact made its form look like a bird, whose body has been created in such a streamlined way as to enable it to split the air easily. Consequently we can understand also that the body of the scheme is an asymmetrical and dynamic form which, without being kept in position by the roads of the motion system which serve, would have appeared to be moving straight forward and unchecked. As mentioned before, the plan of the scheme is organic and strongly unified to the extent which would make it appear destroyed if it were to lose any of its parts.

(vi) The Dialogue of the Horizontal and the Vertical Directions

It was discovered from the scheme's analysis that

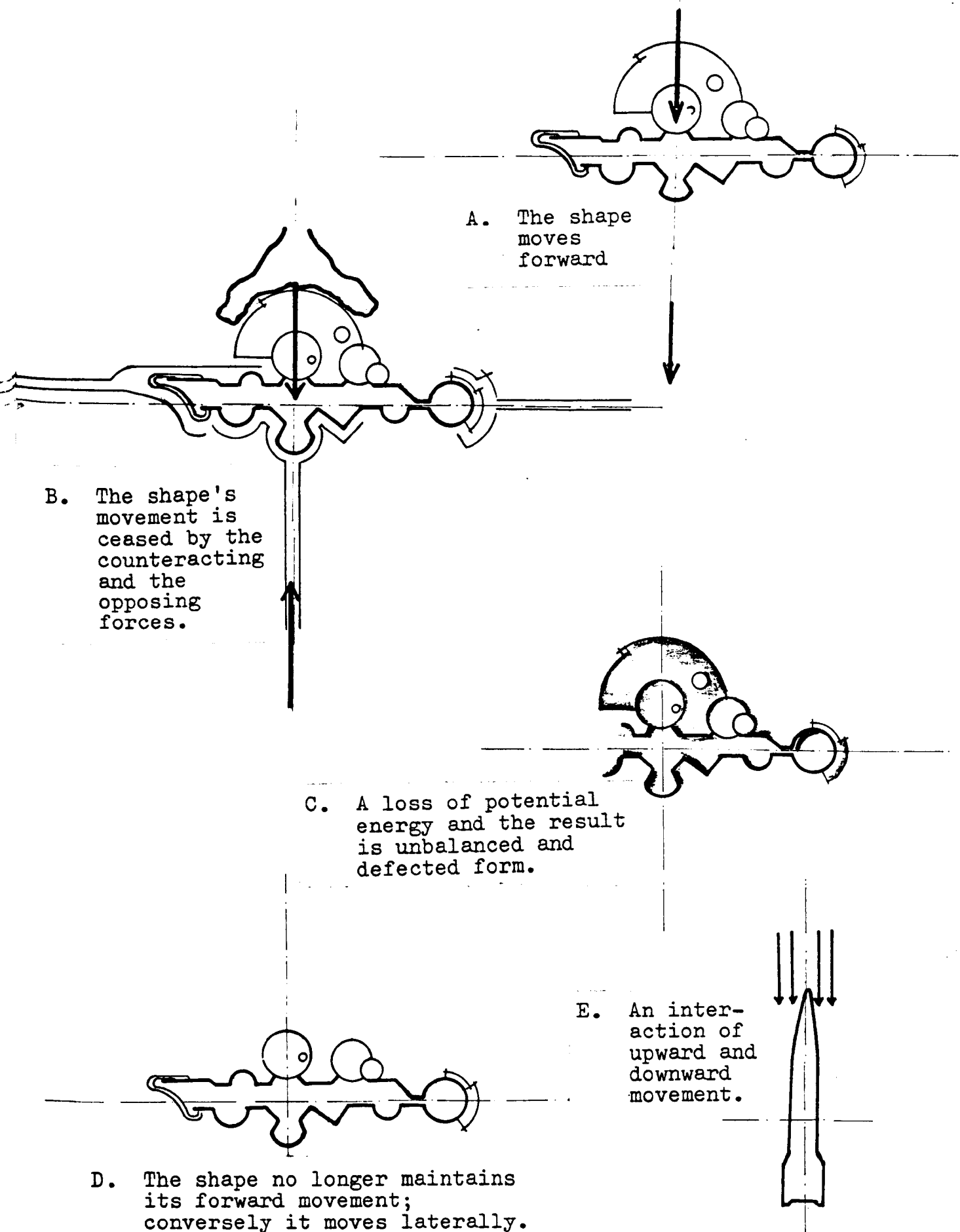


Fig. (6.11). The potential energy of the scheme's form.

(Source: Prepared by the Researcher.)

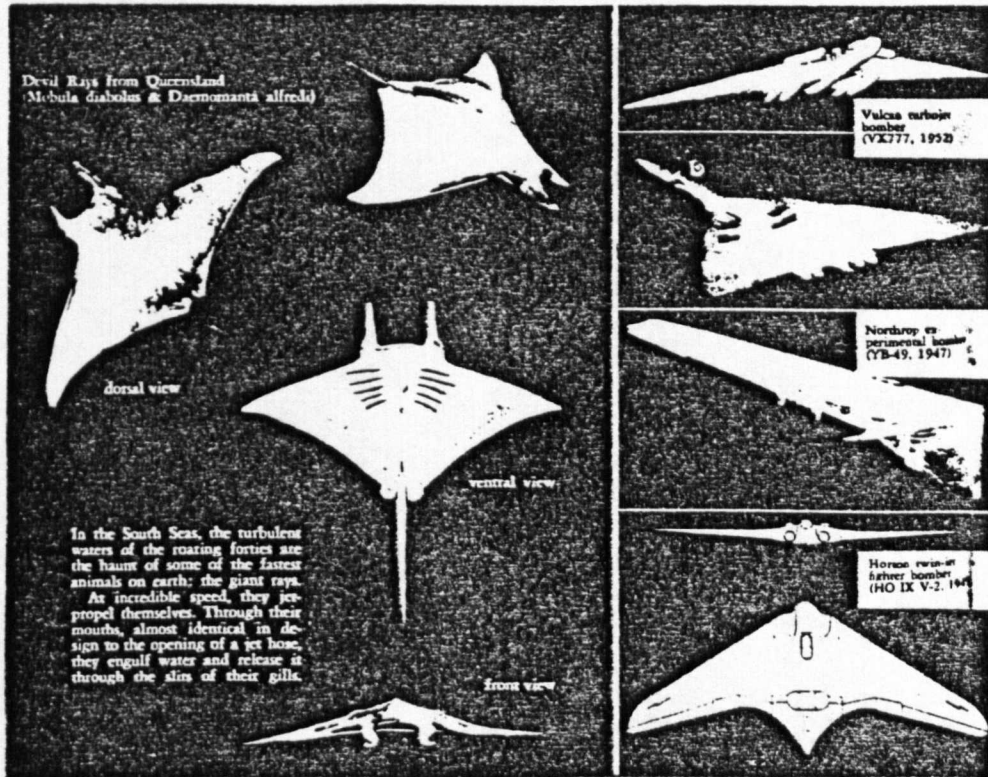


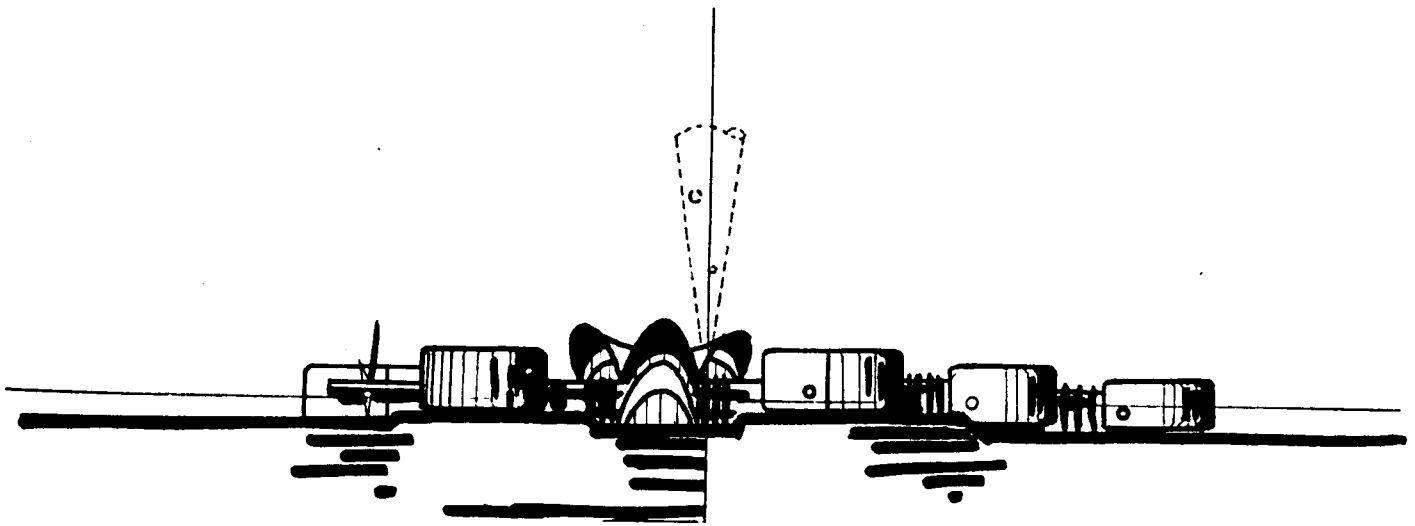
Fig. (6.12). Nature and the aspect of self unity. On the left hand side the illustration shows some sea animals innately endowed with an aspect of self unity. It is an astonishing fact that these natural forms have been borrowed by man to gain products with the same form of unity as shown in the right hand side.

(Source: Grillo, 1960, p.46.)

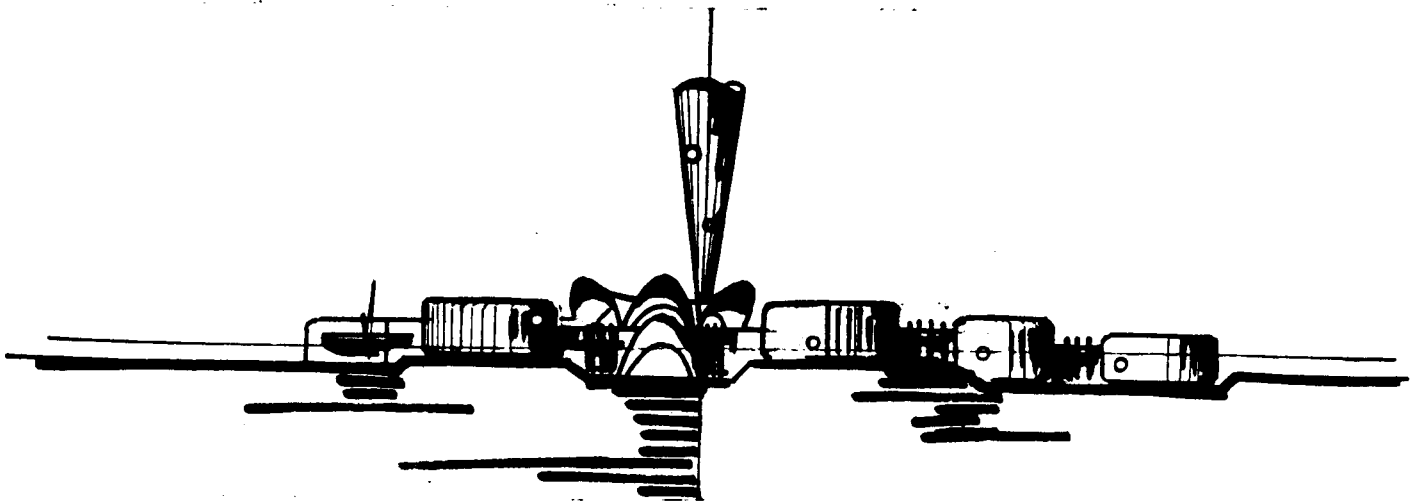
the horizontal direction dominated its form. This fact was an obvious interpretation to the direct need for creating a settled form, which could match and harmonise with the tranquil landscape. while there was a tendency to identify the scheme's form and its location within the expended park , Therefore the tower's use was the right response which needed to fulfil that demand. However, the addition of this tower has established a sense of vitality in the whole constitution and has broken the monotony of the horizontal direction and finally it has evoked life in the scheme.

(vii)The Dynamics of the Internal Spaces

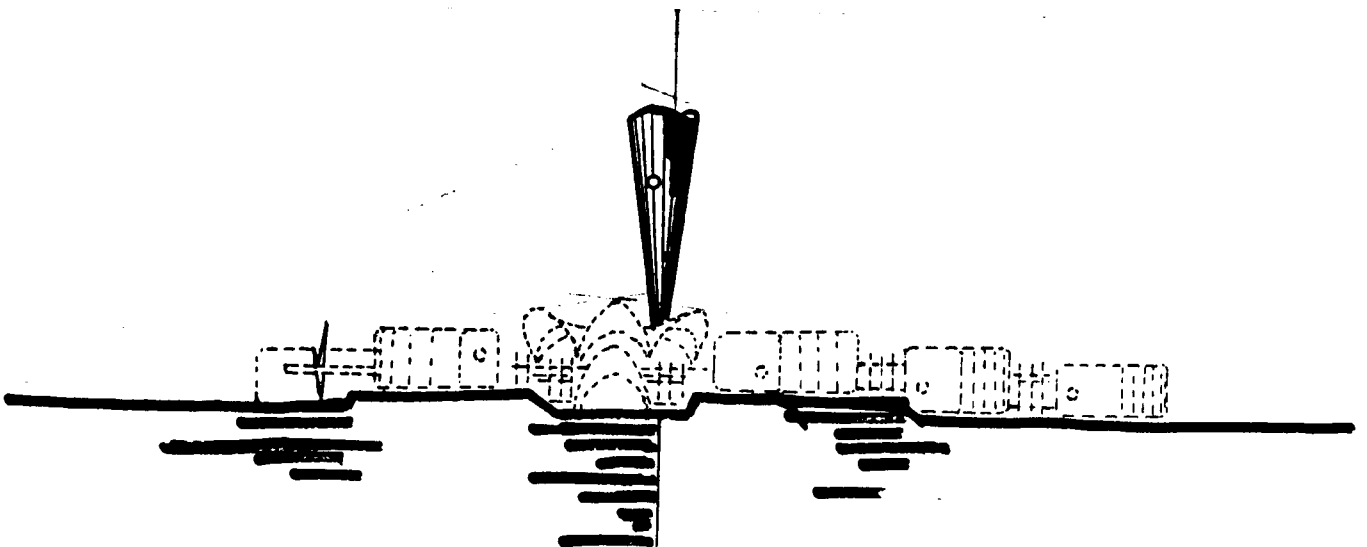
It has been mentioned earlier that lines have contributed greatly in identifying the contents of the internal spaces. While it was discovered that there are spaces which have been characterised with the 'containment property', it was discovered also that there are other spaces which have been characterised as conveying places. Our basic theme in this point is to reveal the dynamics of the internal spaces and their interaction with each other. As a result of my analysis it was discovered that the internal spaces of the scheme are highly interacting with each other, in such a magnificent and dynamic way. The reason for that phenomenon can be attributed to the resulting points of constriction between the connected



A. Sense of Horizontality, by which a perceptual and emotional feeling of tranquility and quietness is established.



B. A Combination of three rival and clashed entities.



C. Sense of Verticality, by which a feeling of excitement is established.

Fig. (6.13). The frontal elevation of the scheme.

(Source: Prepared by the Researcher.)

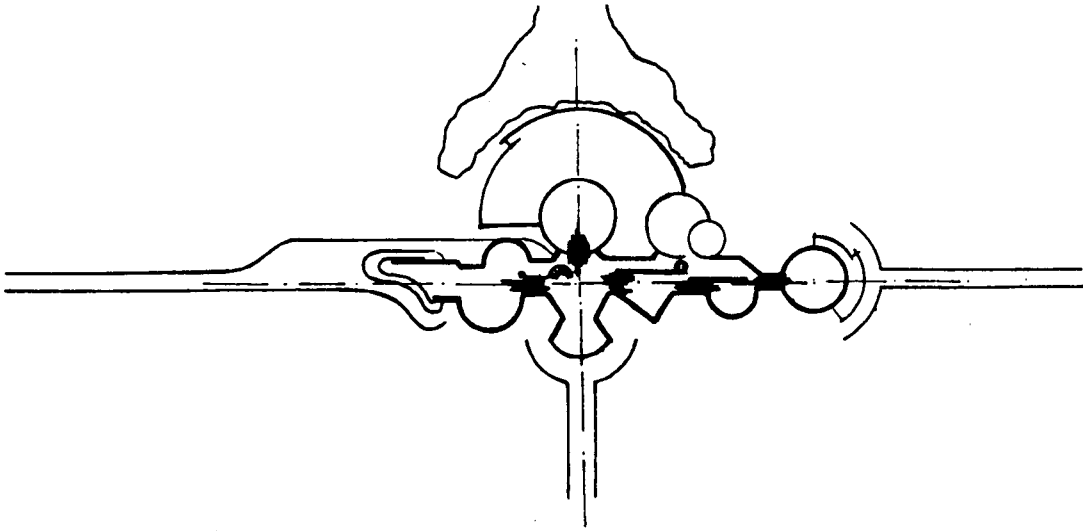


Fig. (6.14). The interaction of the internal spaces. The dark points in this illustration show the places which are characterised by the temporary retardation action.

(Source: . Prepared by the Researcher.)

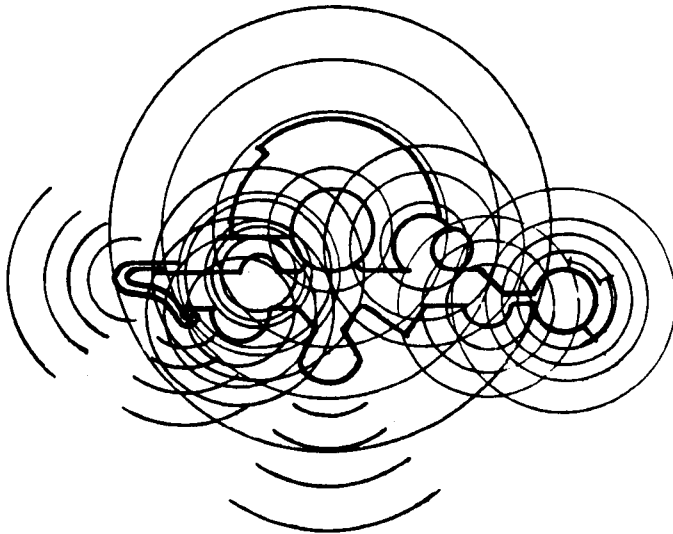


Fig. (6.15). The field of forces of the scheme's form. In this illustration one can be able to notice the impact of using the rounded and the convex shapes upon the environment.

(Source: Prepared by the Researcher.)

spaces, which in their turn have produced a high deal of a 'temporary retardation'. As we know, the creation of such an effect in any artistic work, would create a high tension between its parts.

(viii) The External Influence of the Scheme's Form

It has been discovered from the analysis that the frequent use of the circle in the whole form has a great impact on the potentiality of the form. As a result of dealing with an opened landscape, we were facing the demand of using a form, which can magnify and multiply its power. Hence using the circular form was the right response to overcome this problem. Without using such a device, the negative forces of the free space would have pressed and smothered the scheme's form. Of course we understand that establishing a state of balance between the opposing forces is a vital need. While the use of the convex form was useful in increasing the field of forces of the scheme's form, it was also useful in revealing the expressive quality of that form, and in displaying its third dimension. The analysis of the skyline of the form has showed a visual logic in the manner of its formation; i.e. whenever there was a chance for high activities and large crowd, the line as we can see becomes bulgy, and as the activities tended to diminish towards the ends, the line has diminished with it.

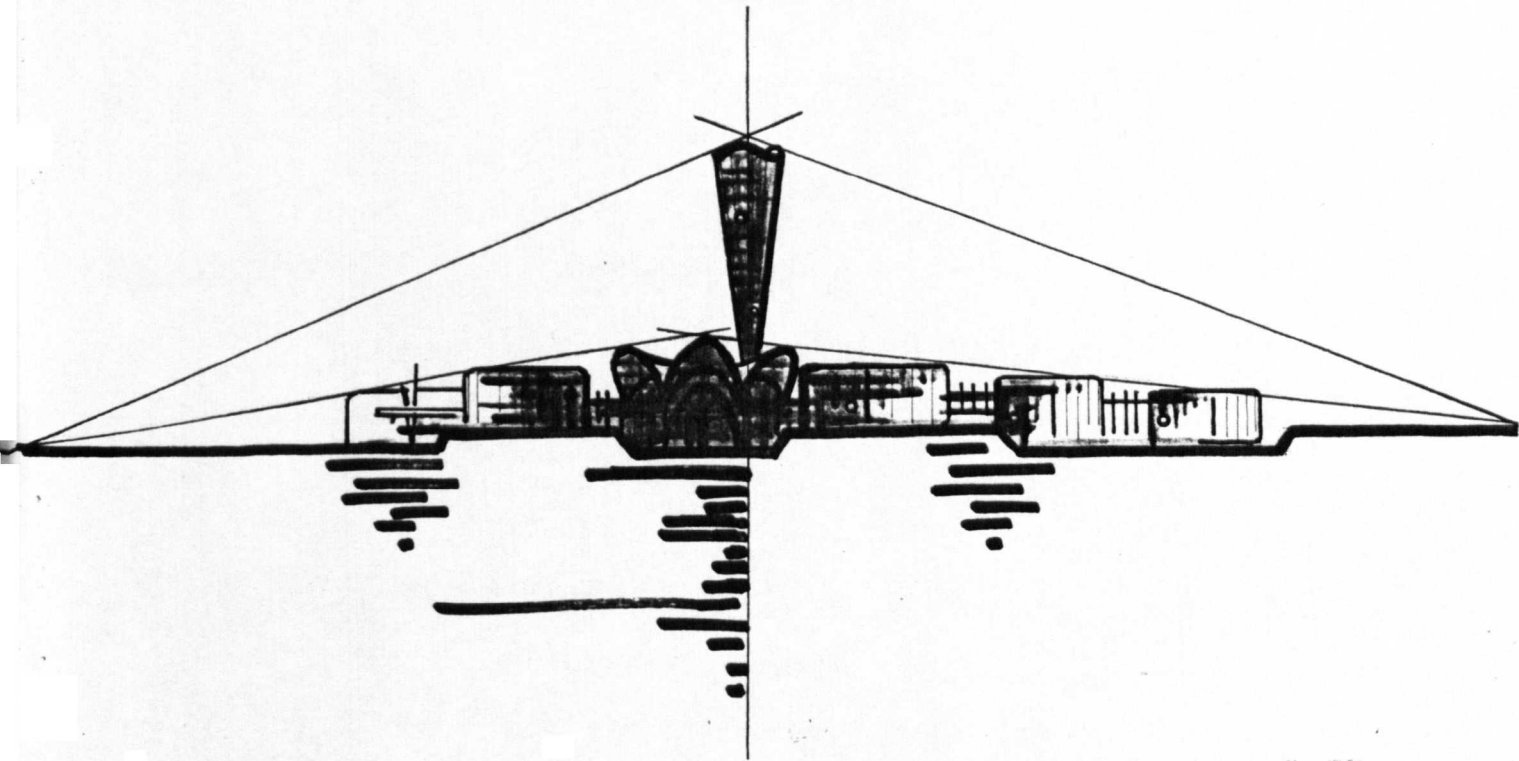


Fig. (6.16). The skyline of the scheme. In this illustration one can notice the visual and the logical interpretation of the expected and the ensuing internal forces. As the skyline swells one can expect a great crowd. But as it degenerates one can expect a lesser crowd comparatively.

(Source: Prepared by the Researcher.)

(ix) The Relationship between the Interior and the
Exterior

By this point the analysis has proved that the exclusive use of simple geometrical forms has resulted in the scheme's form, being fully imagined from outside. Also it was discovered that, using the material, glass, in a wide scale in the facades has increased the external intrusion into the form. Although such a situation is required for getting the outside inside, and vice versa, it should not go beyond a certain level, otherwise the building will not be able to keep any internal secrets, which can be used for exciting and amusing its visitor. Hence we can conclude that using the material, glass, widely and using very simple forms, have produced an undesirable effect, where all of the internal affairs can be discovered from outside and before entering the building.

6.2 THE SCHEME AND THE PERCEPTION LIMITS

It has been mentioned earlier that we perceive wholes and not isolated particles. Therefore we would expect some difficulties to be facing the visitor's park, in perceiving the scheme's form as a whole. The reason for this is the complexity of the form of that scheme. As we have indicated, the scheme's form is composed of three different entities which are clearly distinguished in perspective. These varied personalities established a composition of unrestrained diversity which, according to the 'Eighth Limit' are emotionally repellent, and according to the 'Second Limit' are difficult to perceive, and according to the 'Ninth Limit', it lacks dominance. Although the use of the last three entities has produced a sense of excitement which, according to the Fourth Limit is essential to mental health and growth, and although the use of these different characters has destroyed the monotony of the repetitive rounded form in the frontal elevation, the irrational use of these varied entities in one time has exceeded the logical limit and the human capacity of perception and consequently, it has resulted in the overall form being composed of contradictory parts, lacking dominance. Apart from the relationship between the forms used in perspective, it was discovered that the use of these forms in the plan has created a unified, organic and beautiful form. The reason, as can be understood from

the Third Limit is due to the balanced, logical, simple and orderly relationship between the parts of that form and its corresponded relationship of patterns in our schema, or in the group of the related sub-schemas. Finally it is important to add that the use of the vertical tower and shell, have evoked a sense of excitement not only for the scheme's form, but conversely for the whole park. The sense of novelty and the peculiarity which the two forms has, being rarely used, inevitably would have raised the level of excitement in the park as a whole: The tower not only for being a unique form did so, but conversely it did that because it was considered the highest and the only vertical object in the whole park. Consequently it has created a sense of novelty and newness, which according to the Fourth Limit is important to our mental health and according to the 'Seventh Limit' is vital for avoiding monotony.

6.3 SEVENTH HEAVEN 2

SEVENTH HEAVEN '2' as mentioned earlier in the introduction to this part, is the second version of the last scheme, which the researcher designed after considering the shortcomings of the first submission, which has been identified during the analysis. As we remember, the analysis of the first scheme has proved that the architectonic form of that scheme, is composed of three competitive entities which are struggling with each other to dominate the whole form. Hence it will be discerned here in the analysis of the second version, that the researcher has given more care to the scheme's form, in an attempt to create an indivisible, dominant and united form.

6.3.a THE PROPOSED SITE

In that scheme I had to return to the second site which had been suggested earlier in the first scheme. The site as we can see from the attached map is flanked by the two branched tongues of the existing lake. Apart from the fact that this site would be far from the center of the whole park, it would establish a strong organic relation with the lake being contained and hugged by it.

6.3.b. THE SCHEME'S CONCEPT

The idea which has been used this time has a spatial connotation. In more detail the concept used, as can be seen from the attached illustrations is a hollow circular building in whose center a great monumental column is raised as a symbol for the Seventh Heaven. Around this building another six columns are raised to represent the other six components of the park. The visual and the spatial values of this concept do not lie only in guiding us visually in the vast park throughout the attraction which would be established by the Seventh Columns; conversely it lies in the central power, which the center of the whole constitution has had and consequently make it worthy to be used as a location for the Seventh Heaven's symbol. The scheme's formal constitution as a nuclear organisation of concentric elements, can be described as a centralised concept which, according to Schulz is a cosmic concept. It is remarkable that the idea of using the verticality in creating a spatial and visual structure has been used by Sixtus V in his idea for reconstructing Rome. According to Bacon, Sixtus,

in his efforts to recreate the city of Rome into a city worthy of the church, saw clearly the need to establish a basic overall design structure in the form of a movement system as an idea, and at the same time the need to tie down its critical parts in positive physical forms which could not be easily removed. He hit upon the happy notion of using Egyptian obelisks, of which Rome had a

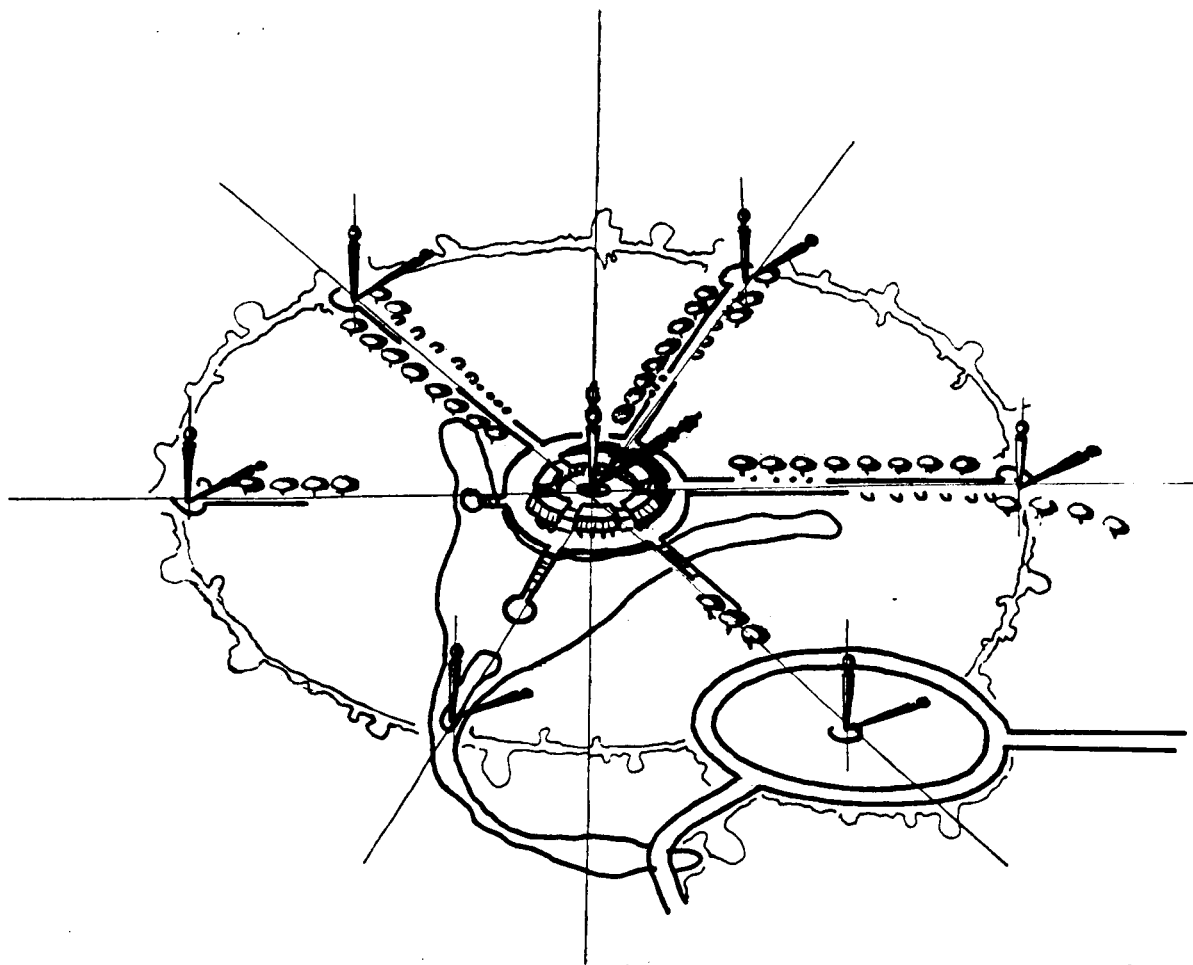


Fig. (6.17). Perspective of Seventh Heaven 2. In this illustration one can see the basic theme of the concept in the middle surrounded by the concentric and the subordinate related and scattered six monuments.

(Source: Prepared by the Researcher)

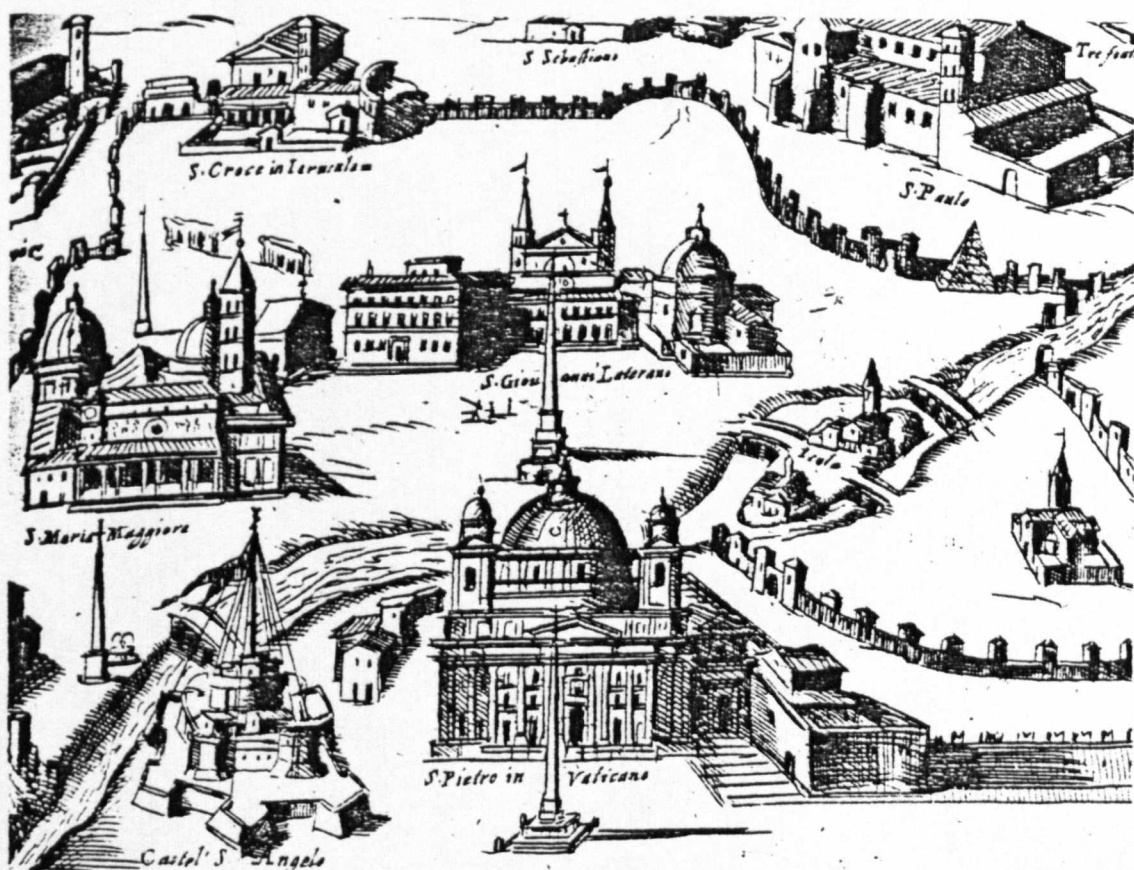


Fig. (6.18). The spatial structure of Rome by Sixtus V.

(Source: Bacon, 1967, p.137.)

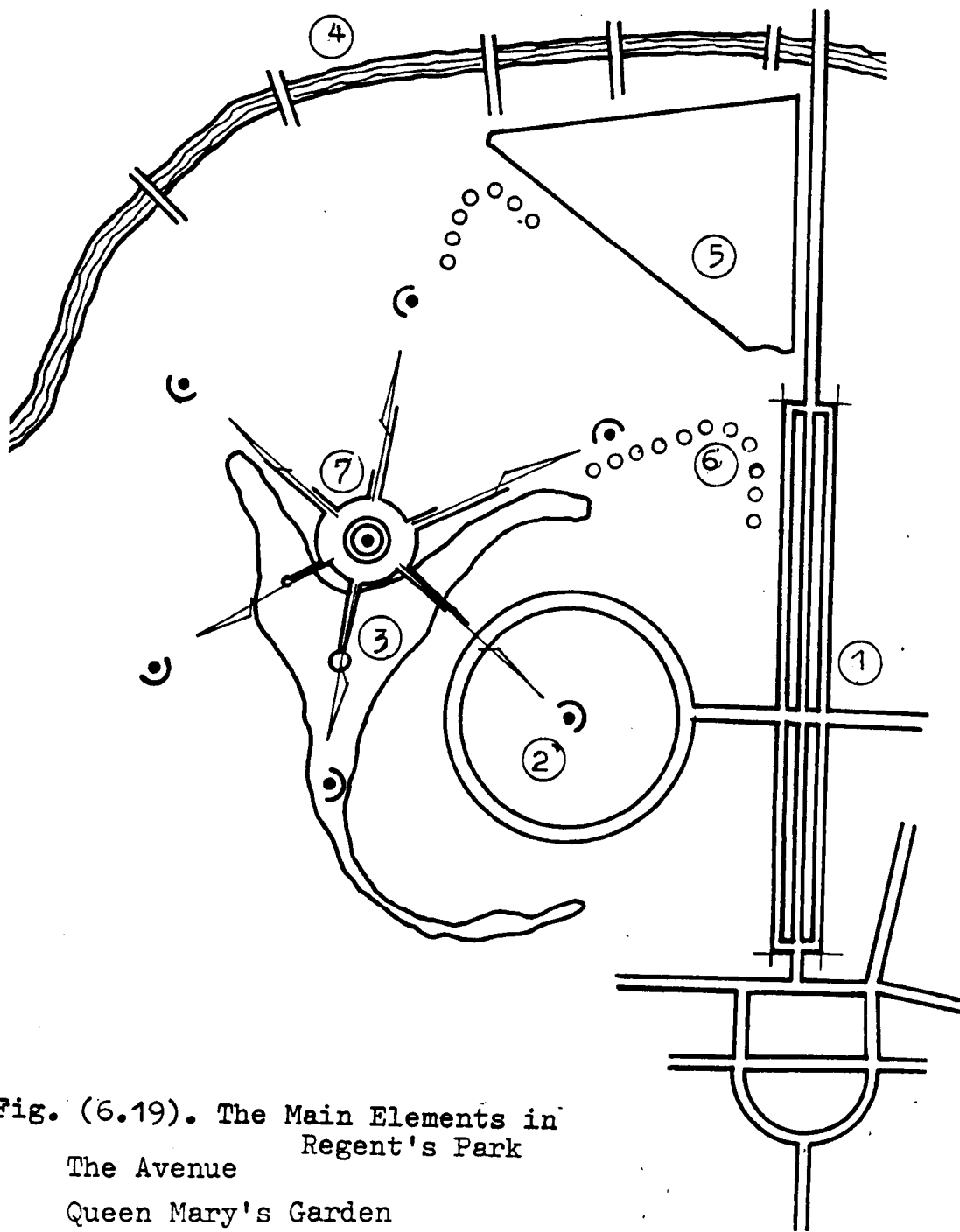


Fig. (6.19). The Main Elements in Regent's Park

- 1 The Avenue
- 2 Queen Mary's Garden
- 3 The Lake
- 4 The Canal
- 5 The Zoo
- 6 The Fields
- 7 Seventh Heaven (the newly added element)

(Source: prepared by the researcher)

substantial number and erected these at important points within the structure of his design. 2

6.3.c. THE DESCRIPTION OF THE SCHEME

The scheme consists of two floors above ground level and one underneath it. The ground floor as we can see from the drawings in the appendices consists of different fused spaces and was meant to be used as a cafeteria, cafe, and lounges etc. This space was designed to be facing a central open garden, which upon its center is raised the symbol of the Seventh Heaven. Inside this closure a nice fountain has been established. As for the first floor it is meant to function as a restaurant, cafeteria, exhibition, lounge cafe, sports area and so on. With regard to the basement, it was designed to be used as a kitchen and as a storage place.

6.3.d. THE ANALYSIS OF THE SCHEME

The scheme's form as can be seen from the drawings is a horizontal rounded mass, which upon its center is raised the symbol of the Seventh Heaven. While the form of that scheme is meant to be simple, in order to produce a whole and an indivisible constitution, we find that it was intended also to be lively, having a sense of vitality.

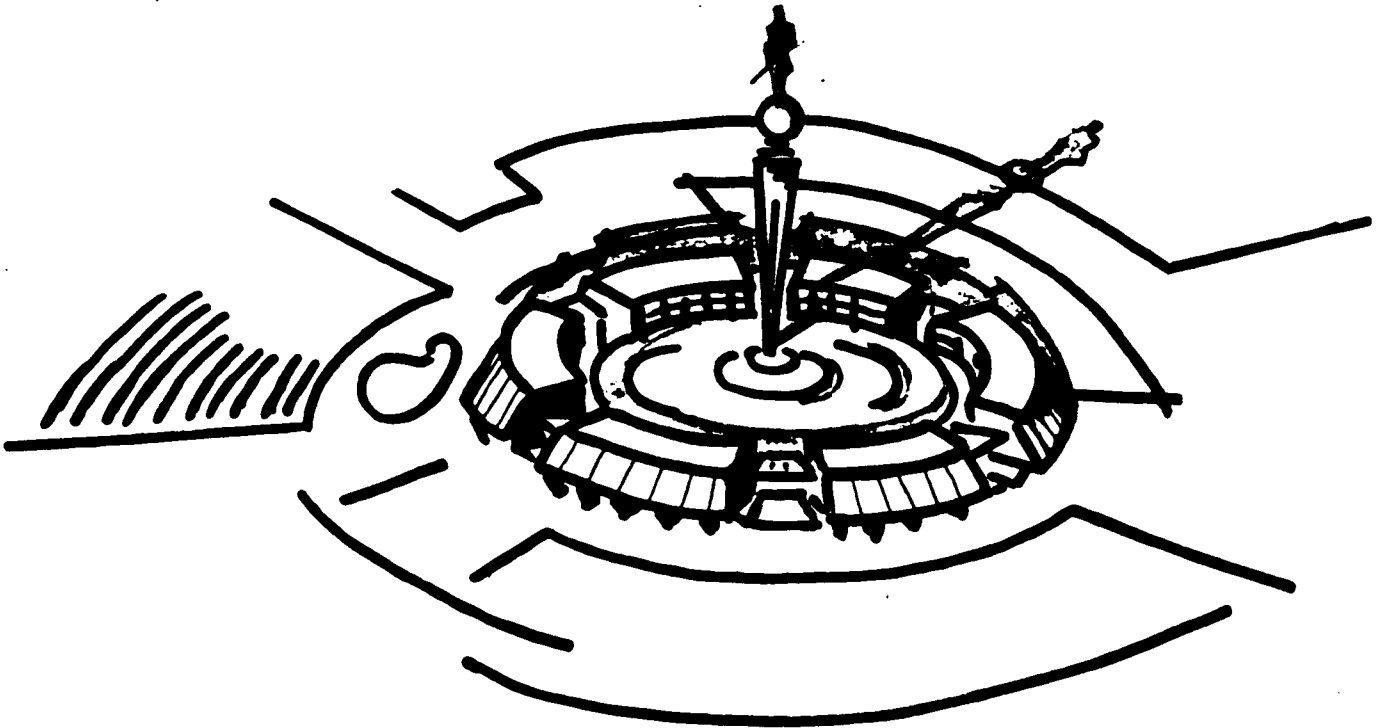


Fig. (6.20). An aerial perspective of Seventh Heaven 2, in which one can see the suggested carried statue of Regent, as a representation of the symbolic significance of the Seventh Heaven.

(Source: Prepared by the Researcher.)

In response to these demands the researcher used the circle to meet the urge of creating the simple and the unified form, and used the verticality and the slant direction to meet the elements of constructing a vital and lively form. In addition to the simplicity and the coherence of the used form, the use of glass in a wide range of forms in the scheme's elevation gave another chance of producing a sense of dominance. Worthy of note that the established dialogue between the shining surface of the glass and the dark space, which lies in the shadow underneath it, has produced a sense of contrast between shadow and light, the thing which heightened the vitality of the form. The scheme's form as can be seen from the drawings has six entrances of which every one is enframing one column of the surrounding six. These columns are considered to be the terminal vista when seen from the entrance's aperture. Using the centralisation concept which contains the basic theme in the middle and the other important targets out on the circumference is an old technique which has been carried out in constructing the old city of Baghdad. According to Hoag (1977, p.35), the center of the city was occupied by the Al Mansur Palace and the city's main mosque, as they were considered the basic themes. On the other hand the city's wall had four gates, of which every one was facing a certain direction of the infinite islamic empire at that time; i.e. the Khorssangate opened toward the northeast, the Kufa gate toward Mecca,

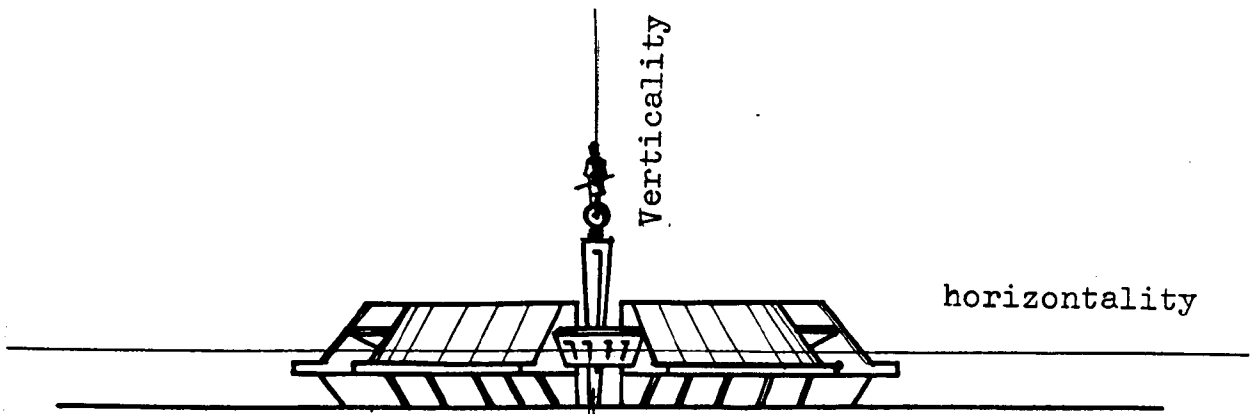


Fig. (6.21). An exciting dialogue of horizontal and vertical directions. In this illustration a sense of unity is established through the dominance of horizontality over the verticality.

(Source: Prepared by the Researcher.)

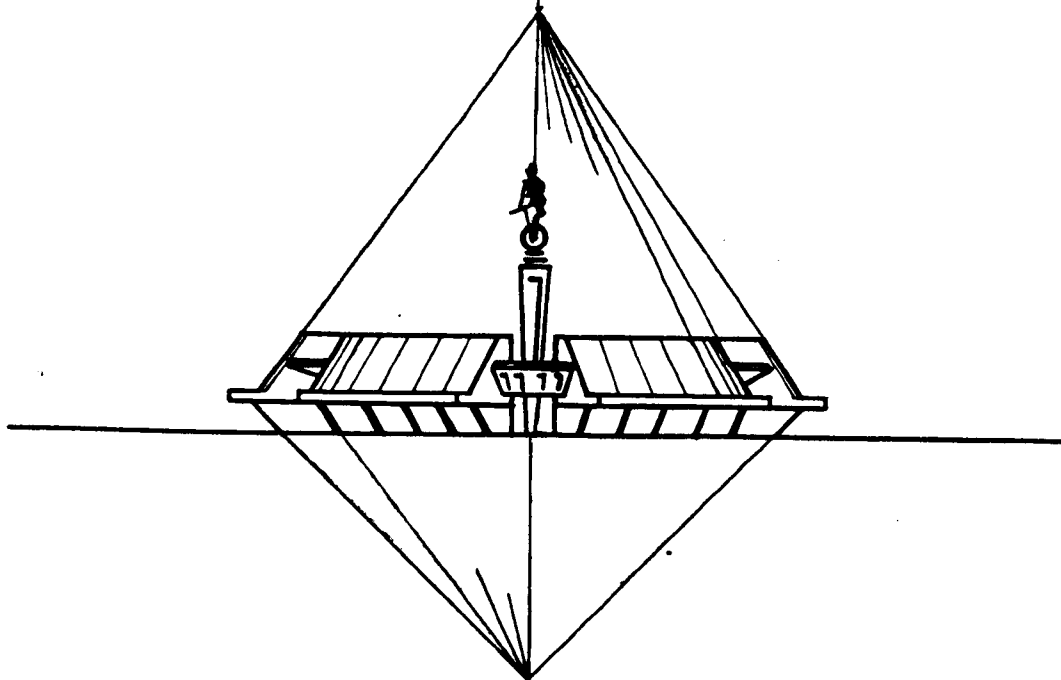


Fig. (6.22). Tension of polarity. In this illustration one can perceive a sense of upward movement; a sense of well interlock and balance; and finally a sense of lightness.

(Source: Prepared by the Researcher.)

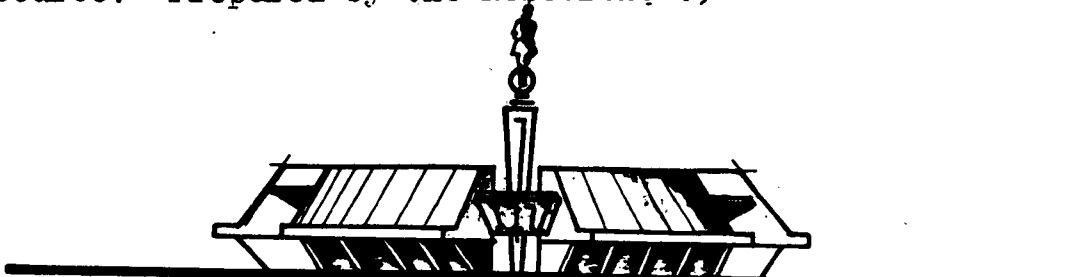


Fig. (6.23). A dialogue of light and shadow by which a sense of life, vitality and unity are established.

(Source: Prepared by the Researcher.)

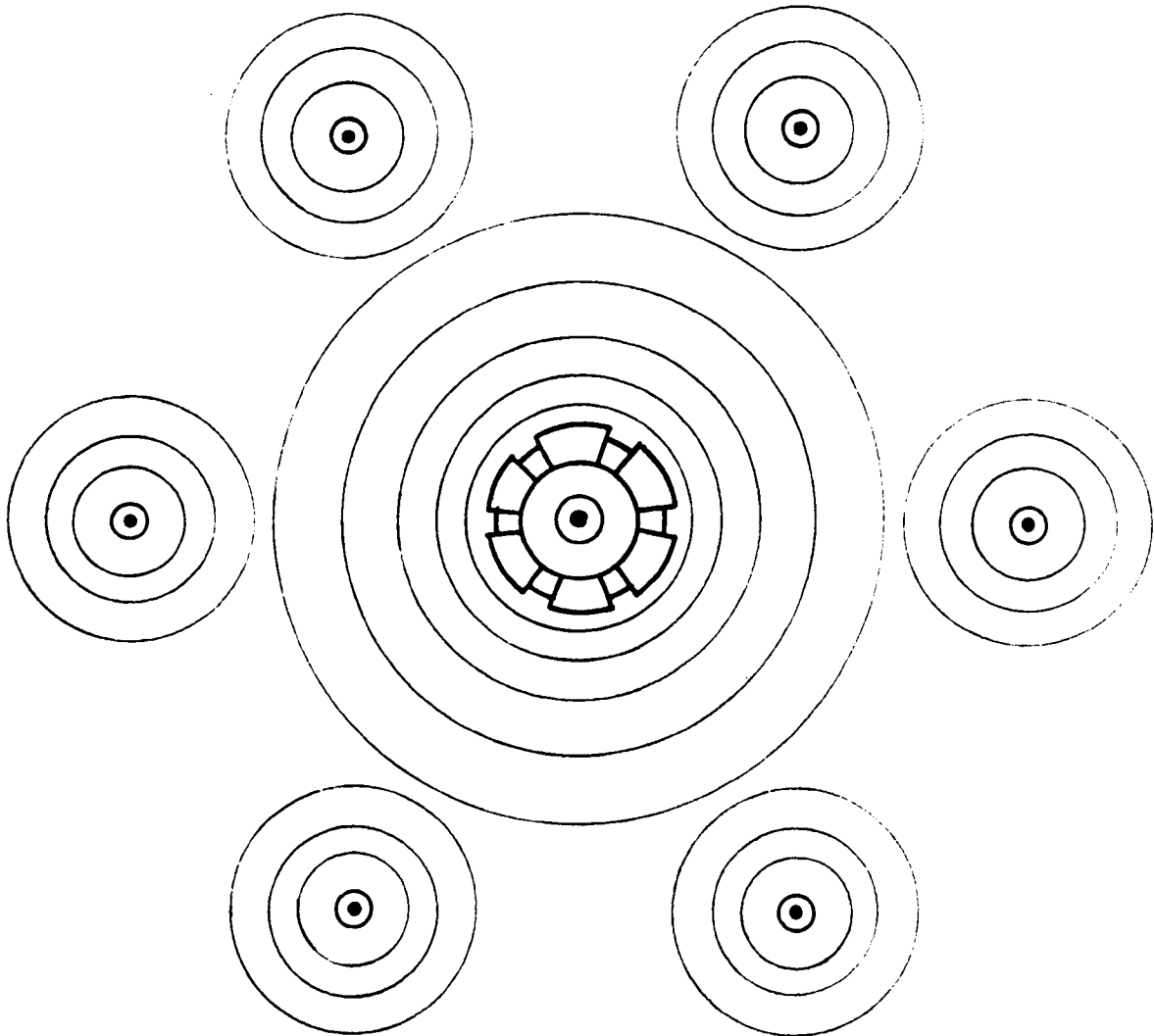


Fig. (6.24). The expected engendered field of forces of Seventh Heaven 2. Throughout the construction of these forces a sense of magnified positive energy is established in order to oppose the potential negative forces of the expanded and the surrounded open space.

(Source: Prepared by the Researcher.)

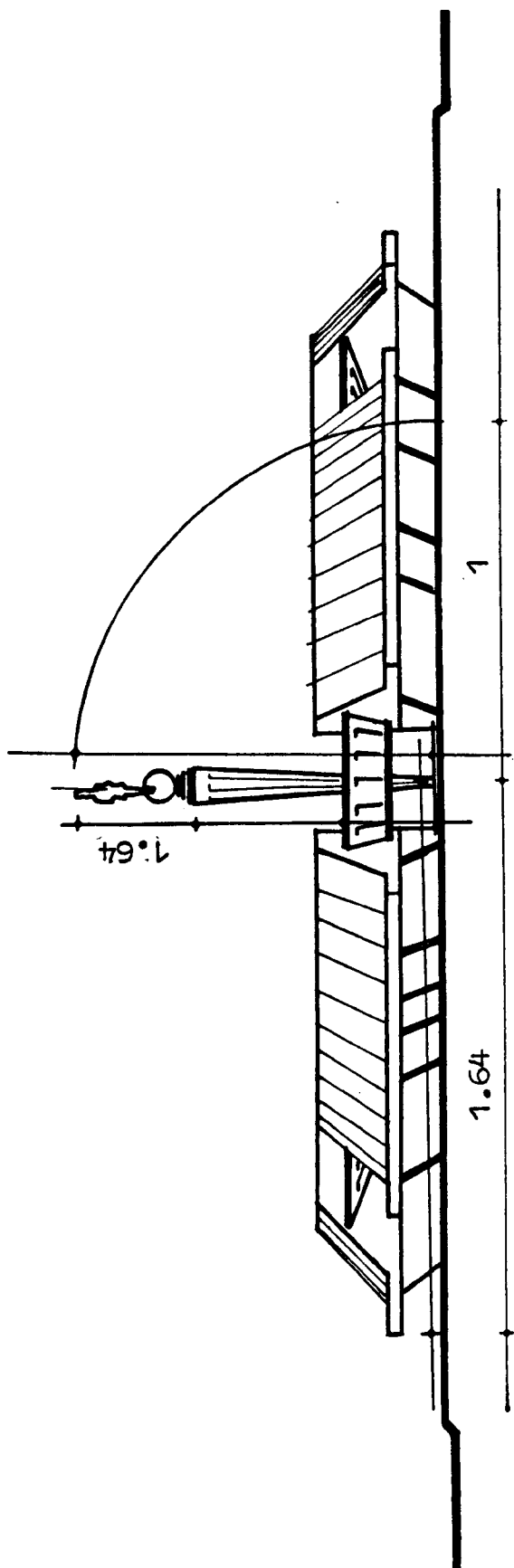


Fig. (6.25). The Golden Section
 & The Scheme
 (Source: Prepared by the Researcher)

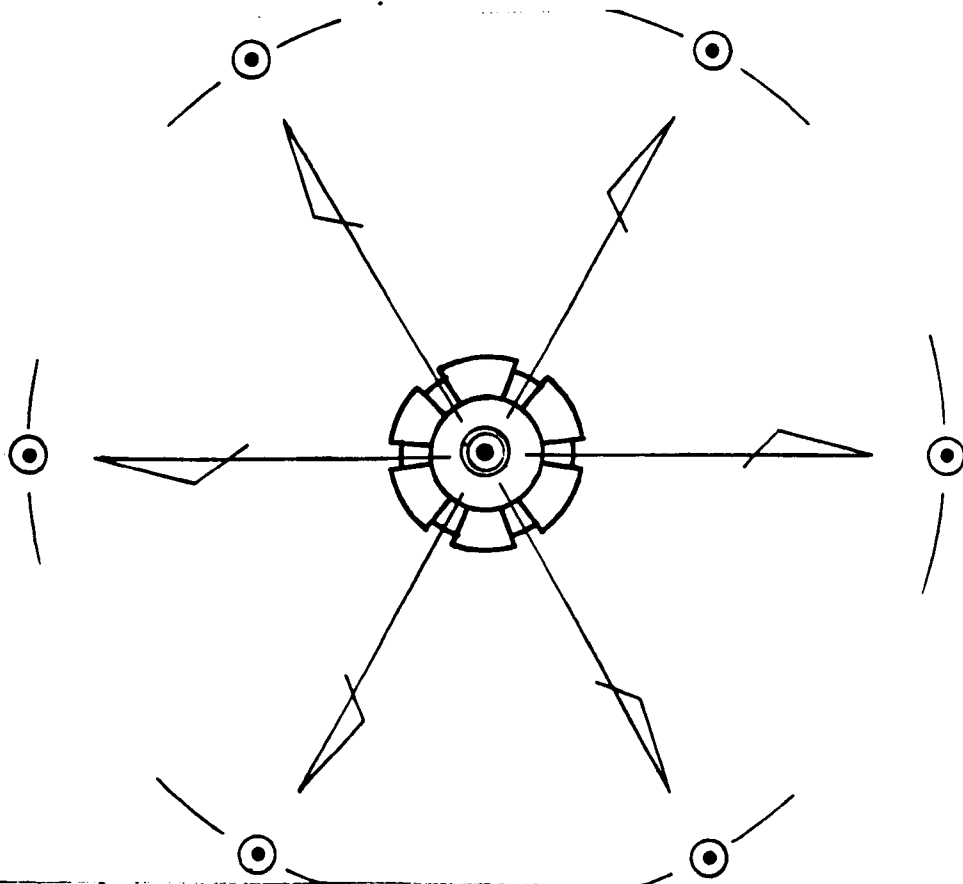
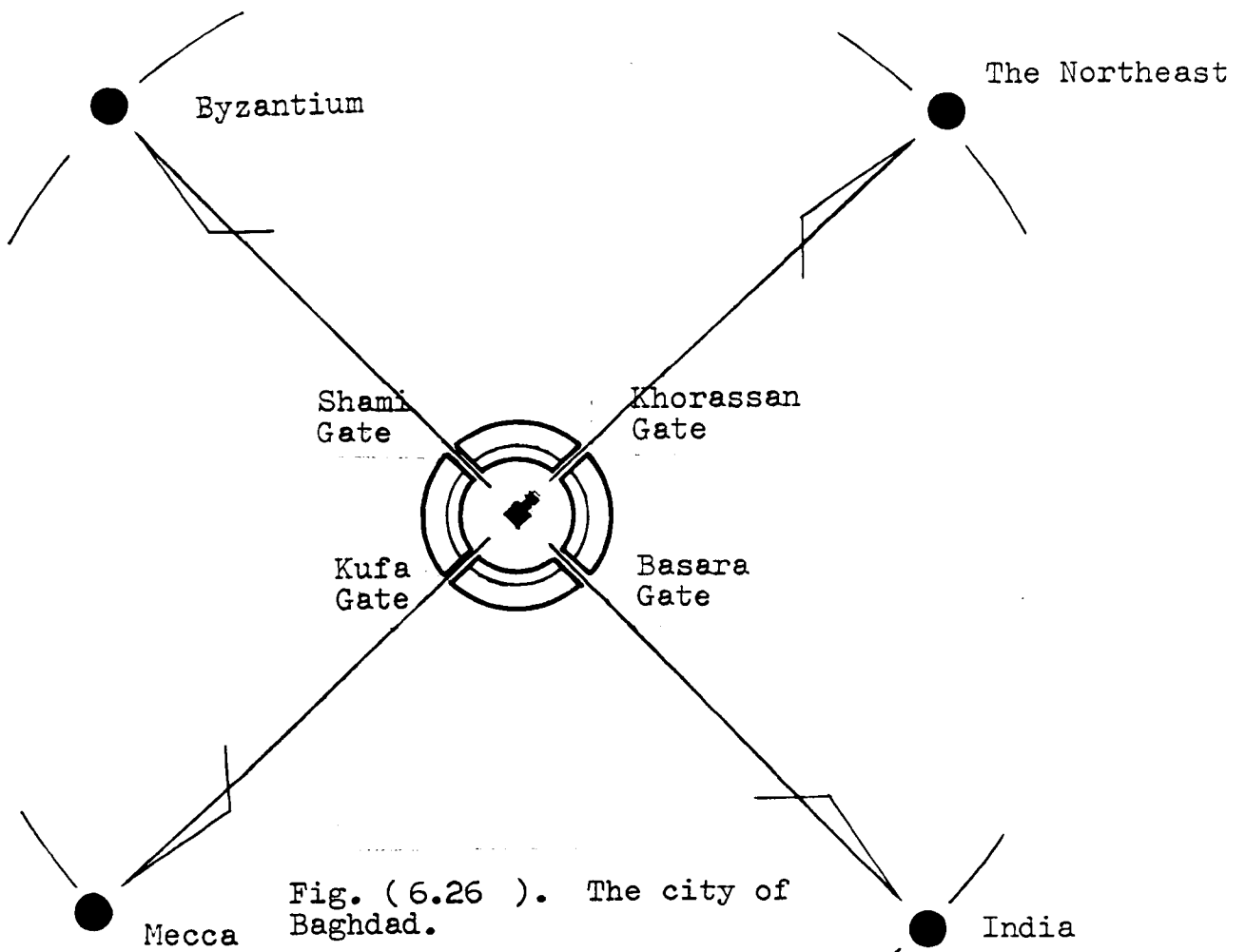


Fig. (6.27). A comparison between the concept of the Seventh Heaven and the concept of the city of Baghdad.

(Source: Prepared by the Researcher.)

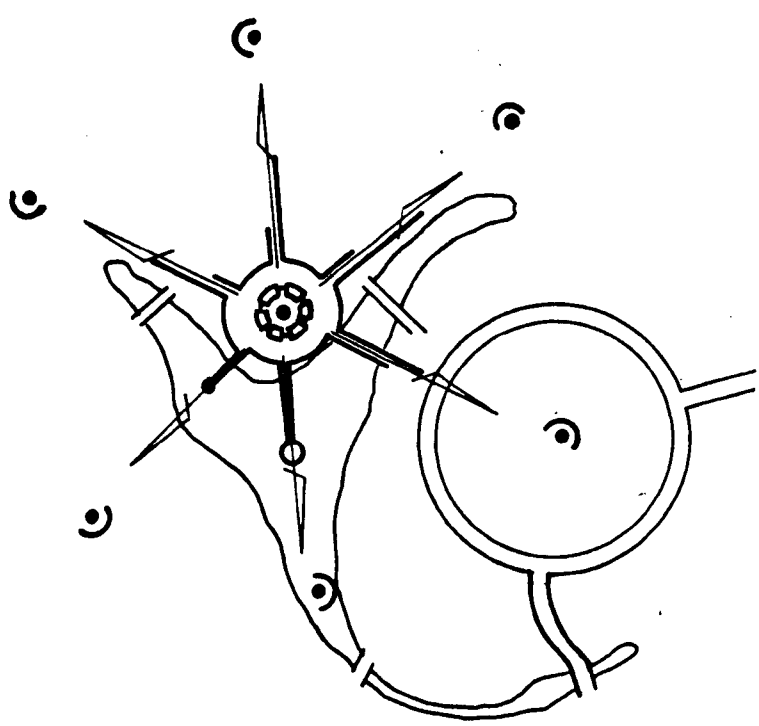


Fig. (6.28). Sense of completion. In this illustration One can perceive a sense of organic integrity which has been raised by the addition of the centralisation concept. It is worthy of indication that this concept was an extension of the original concept of John Nash in designing Regent's Park.

(Source: Prepared by the Researcher.)

and the Shami gate toward Byzantium and the northwest, and the Basra gate toward India and the southeast. It is remarkable that the use of the circle in the scheme concept was an extension of Nash's idea in designing Regent's Park. Nash in his original concept proposed the establishment of a complete circle of buildings, which was known as Portland Place. This circle as Bacon states, was "recalled in the two half-circle crescents to the north, and in the great double ring of terrace houses - the inner circus and the great circus - designed to give architectural form to the park".³

6.4 SEVENTH HEAVEN 2 AND THE LIMITS OF PERCEPTION

According to the results of analysing the first submission of the Seventh Heaven, it has been discovered that the scheme's form has a sense of complexity which exceeds and does not correspond with the limits of the human perceptual ability. No doubt that this discovery was the important motive behind redesigning the Seventh Heaven. The new scheme as it can be seen from the attached illustration is composed of only one coherent and unified circular form. This form as one might be able to feel, has a sense of simplicity and a sense of one-ness, which according to the first limit of perception is acceptable and preferred by the human's mechanism of perception, which tends to perceive only wholes. Although verticality and horizontality were

employed in the form of this scheme, their application has led to constructing a composition of varied elements, which according to the fourth limit is preferable and it causes a sense of excitement and surprise; things which are needed for our mental health and growth. As can be noticed from the illustration, the application of this verticality and this horizontality did not only establish a lively and vital form, but also constructed a situation of opposing forces, in which the force of horizontality was the dominant, the phenomenon which according to the ninth limit is emotionally satisfactory. It was mentioned earlier that the scheme's form comprises only one simple form, which consequently has resulted in producing one dominant entity. Hence it is worthy of note that this simplicity is perceptually preferred and according to the second limit, it allows a greater chance of perceiving the form of the scheme. It is important to mention here that the addition of the rounded form of the scheme, with its circular spatial concept has an undeniable perceptual impact upon the whole park. The reason is because this addition has established a sense of repetitive, varied and rational relationships between the newly added circular forms and the already existing one. This relationship, according to the fifth limit lead to the construction of a constant form which according to the first limit does meet our perceptual desire in perceiving consistent wholes, and according to the second limit is far

from the complexity which is perceptually repellent, and according to the eighth limit is easy to handle perceptually and consequently accepted by our emotion.

6.5 THE SEVENTH HEAVEN

&

THE EGYPTIAN ISLAMIC ARCHITECTURE

In this part the Researcher is trying to evaluate his second version of the Seventh Heaven against the criteria and the principles of Egyptian Islamic Architecture. In order to do that, the researcher had to make a quick and general review of the principles, the considerations and the factors which contributed in evolution of that style in Egypt. The Islamic elements of the Egyptian style which are reviewed here would be, more or less, those elements which have been used in the design of the Seventh Heaven, i.e. the form; the court; the fountain; the decoration and the ornaments and finally the relation between the inside and the outside.

6.5.a THE FORM

It has been argued that the Islamic architecture in general has used in its constitution the basic geometrical forms such as square, rectangle, circle, octagon, and hexagon. It is important to mention that the application of these forms was not limited to the design of the mosque only; conversely it transcended that limit in order to include most of the public and the residential buildings. As an instance of using these geometrical forms, the mosque of Ibn Tulun is a good example of the use of this geometric form. According to Briggs (1974, pp.49-50, the form of that mosque is very nearly a perfect square

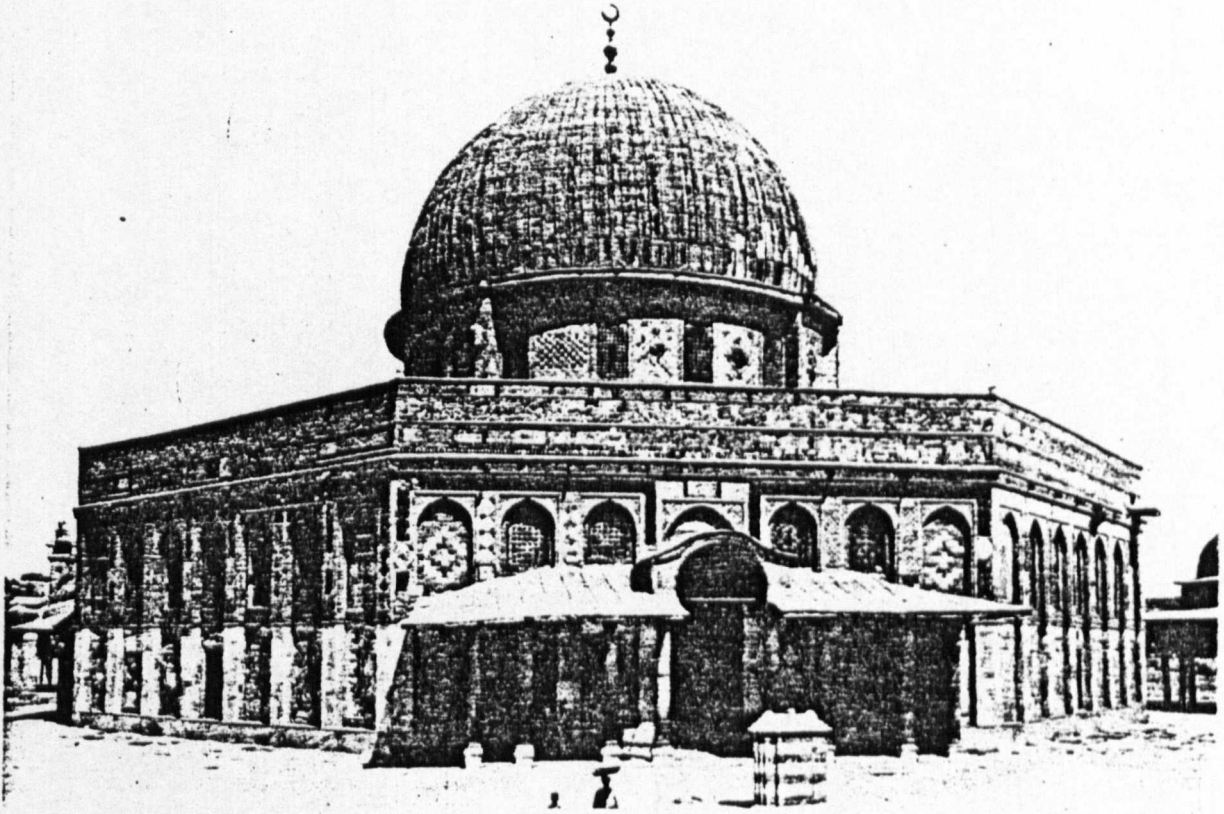


Fig. (6.29). Qubbat As Sakhrah, Jerusalem, is an example of Islamic building constructed of a pure geometrical form.

(Source: Briggs, 1974, p.32)

(530ft. by 533ft.).⁴ Using the previously mentioned geometrical forms was not only taking place in the Egyptian Islamic architecture. Conversely the use of these forms was commonly used in most of the other Islamic countries during the medieval period. The form of the mosque and the 'Medrasa', as in Golvin & Hill's description, was of a square shape.⁵

6.5.b The Court

The court is considered to be one of the most important features of the Islamic architecture. Most of the Islamic buildings in Egypt have had a court. In general the function of the court has varied according to the type of the building, which this court was a part of. The court in addition to its function as a praying and meeting place in the mosque; it was used for other different purposes like politics. According to Hoag;

We must not imagine that the use of such spaces was exclusively religious. Like the Greek agora or the Roman forum, the great court of the Islamic mosque was also a place of public assembly. It served as a law court and debating hall and, most important for later architectural history, it was the place where the Caliph or his appointed governor was acclaimed and accepted by the community. 6

According to Briggs (1974, p.150), the court was used as a place for ceremonial occasions, where the Muhammadan's guests used to meet each other to listen to the flowery oriental oratory or music.

6.5.c. The Water's Element and the Fountain

During the medieval Islamic architectural period in Egypt, the fountain gained a special importance. The reason for this is the heat which characterises the region



Fig. (6.30) Bardo's Palace courtyard, Algiers. This place with its fountain, exotic trees, and pools have contributed to the charm of the whole complex, the reason for which it was used as the center of daily life in the Moorish houses.

(Source: Hill & Golvin, 1976, p.294.)

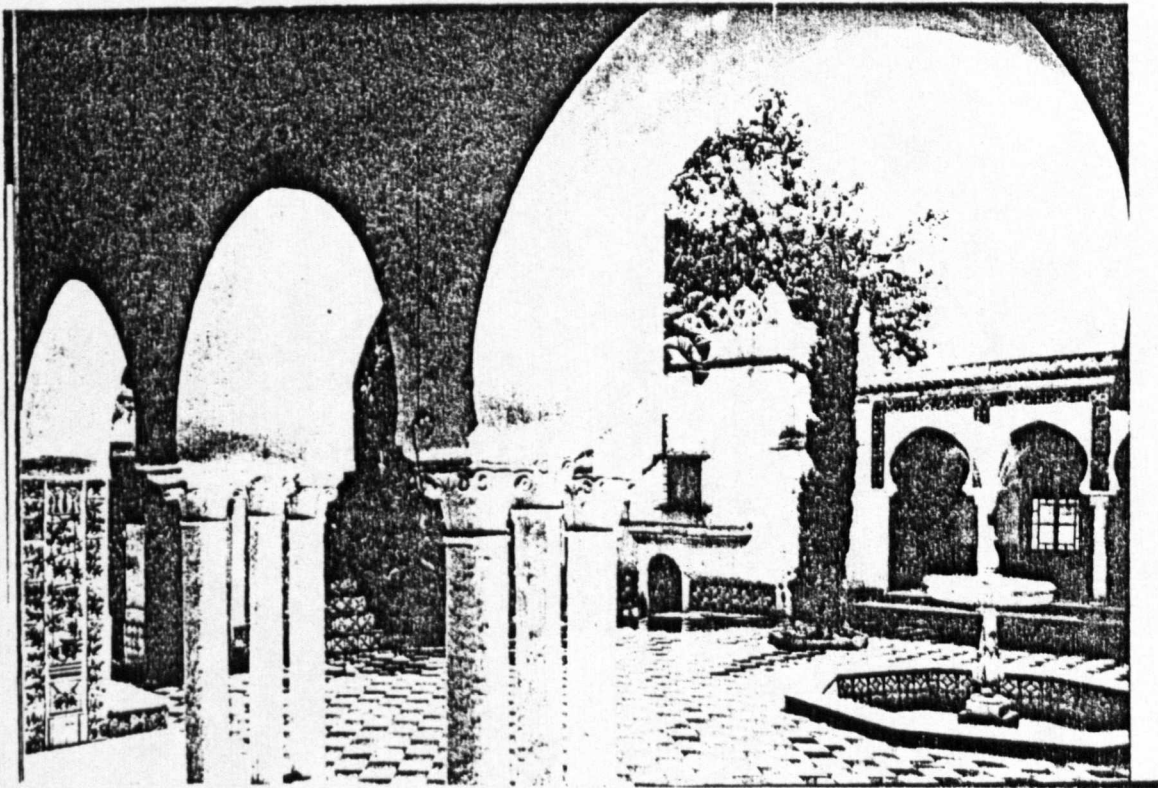


Fig. (6.31). Different View of Bardo's Palace Courtyard.

(Source: Hill, & Golvin, 1976, p.295.)

of North Africa within which Egypt lies. Therefore the function of the fountain was primarily a 'heat relief', as Hill and Golvin indicate. The fountain usually was positioned in the center of the court, as in the mosque's case or as in the small house's case. However, on other occasions, the fountains were placed inside the building as in the case of the large houses, where such a setting was needed in the reception-room as an ornamental and heat relief element.

6.5.d THE ORNAMENT

The Islamic architecture in Egypt is mainly characterised by using plants and the other floral shapes as an ornamental element. The motive behind such phenomena has a religious attribute. On one hand, as Hoag says, (1977,p.32), these floral elements were introduced to the building as decorative elements. On the other hand such ornaments were meant to stand as a symbol of paradise, the significance of which the Muhammadan believes. It was argued also that the mere use of these floral shapes in decorating buildings, was also due to the fact that the Islamic religion was against the 'secularism and all ostentation'. Therefore it was argued that all other kinds of art were suspect if not actually the work of the devil. As in Gothic Architecture, Islamic Architecture generally and in Egypt particularly was ornamentally so rich. According

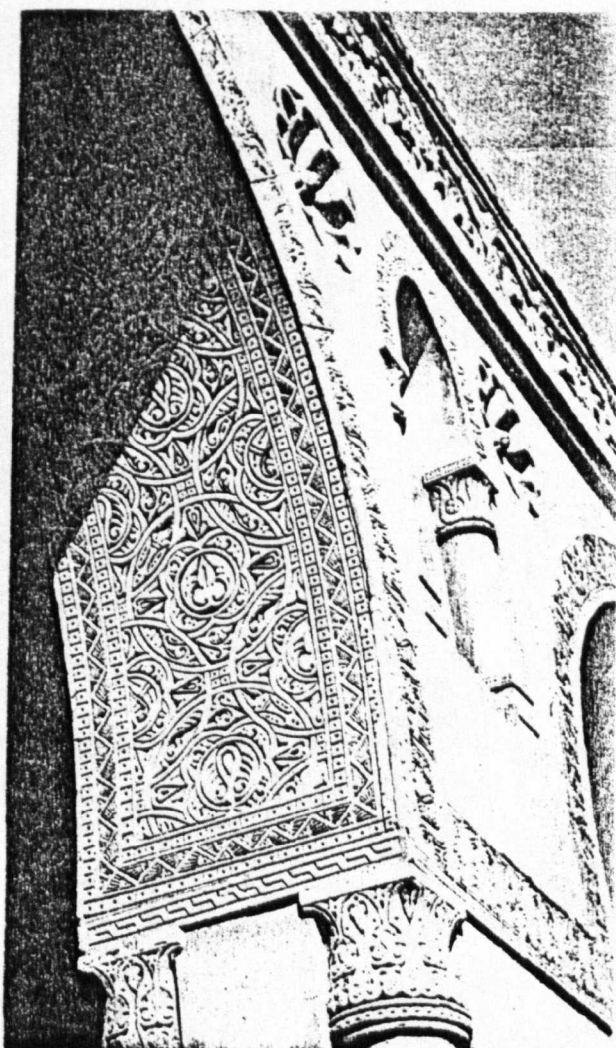
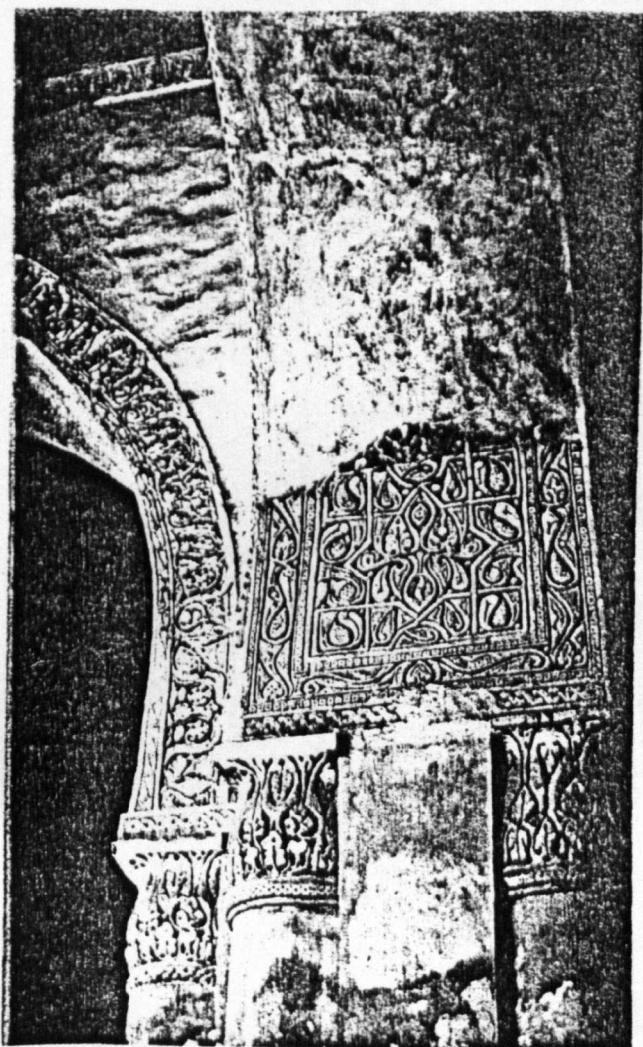


Fig. (6.32) Ornamental Details in Ibn Tulun Mosque.

(Source: Hill, Derek & Golvin, Lucien, 1976, p.184.)

to Briggs:

Ornament was applied to structural features in the Medieval East as well as in Gothic Europe. Arches and capitals were adorned with carving, window openings were subdivided by a form of plate-tracery, piers were decorated with engaged shafts, doorways with richly-sculptured recesses, and the heavy beams of flat ceiling with gilding colour. 7

The exterior of the Egyptian Islamic house was nearly bare of the decorative elements where it was exposed to the destructive ^{AMS} Khamsin wind. Conversely the interior of the house was, as Briggs says, (1974, p.147), richly decorated especially in its court. In contradiction to the simplicity of decorating the internal walls of the Egyptian Islamic house, the ceiling was dominated by the rich ornament. In general wood and gypsum, as Briggs says, were used in the construction of the previously indicated ornament. As an exception, ivory and ebony were used to inlay some of the valuable items.

6.5.e THE TREATMENT OF THE EXTERNAL WALL

It has been argued, as in Briggs (1974, p.146), that the Islamic buildings in the region of North Africa were planned to provide a high level of protection against the hot weather which characterised this region. Such procedure, as Briggs indicates also, is considered to be the extreme opposite of what is taking place in the European buildings where the external walls of these buildings were intended to be largely opened to allow the maximum amount of sun and light, and were designed also to

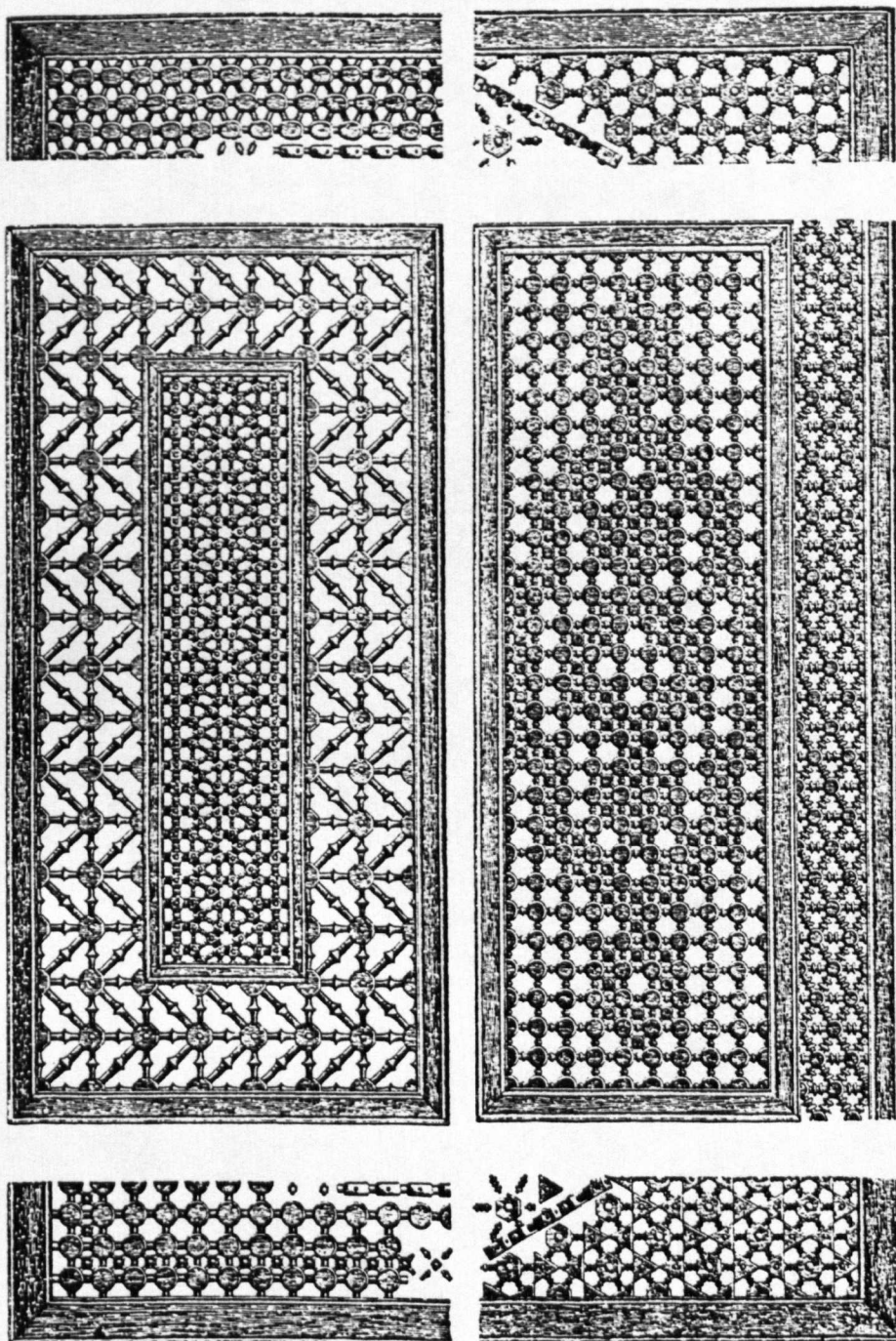


Fig. (6.33) Examples of Mushrabiyyah, Cairo.

(Source: Briggs, 1974, p.212)

protect the internal spaces from the cold. In general the hot weather, as a strong climatic and influential factor, was the direct reason behind inventing the known Islamic roof ventilator 'the Malqaf' and the Orial, 'the Mushrabiyyah'. The orial was more than its function as the house sun's protector and its ventilator; it was used primarily as a visual shield against the external intrusion. Such a procedure as Briggs (1974, p.147), says has a traditional and sociological implication, where women have to be veiled and not to be seen by any foreign males as the Koran states. As an important fact, the use of Mushrabiyyah is meant to be used as a device which allows women to look out provided that they are not looked at from the outside.

6.6 SEVENTH HEAVEN 2 & THE EGYPTIAN ARCHITECTURAL ISLAMIC CRITERIA

6.6.a THE FORM

In terms of form it has been discovered that the Egyptian Islamic architecture has employed the basic moods of the geometrical forms. Hence we can understand that the use of such a comparatively intricate form in Seventh Heaven 2 is considered to be odd and peculiar.

6.6.b THE COURT'S FUNCTION.

As we understand, the function of the court in the Egyptian Islamic architecture was more or less similar

to its function in European architecture, where it was used as a parvis, market and as a congregational and ceremonial meeting place. Therefore the use of such element in Seventh Heaven 2 would be expected to have a degree of analogy with its use in Cairo's medieval city houses, as being the Muhammadan place of meeting and celebration, where such an entertainment public building like Seventh Heaven 2 did not exist in the old city of Cairo. However, we should bear in mind that the context of such use in both eastern and contemporary western civilisation has its own idiological implication which must be understood and interpreted differently. Also, it must be understood that the allowed degree of the external spatial intrusion which characterised the users of the Seventh Heaven as an 'extroverted people', was not permitted in the design of the Egyptian Islamic Court, whose users were understood as 'Introverted people'.

6.6.c THE USE OF WATER AND THE FOUNTAIN

It was argued that the fountain's use in the Egyptian Islamic architecture was necessary as an ornamental and primarily heat relief element being as Egypt lies in the tropical heat region. Hence, we find that the use of such an element in Seventh Heaven is merely decorative and only has a formal attribute, being that Britain lies in the northern cold region of the world.

6.6.d. THE ORNAMENTATION ELEMENT

As has been mentioned earlier, the ornamentation

element in the medieval Egyptian Islamic architecture was confined to the use of the floral and the plant's shapes, which represented to the Muhammadan the symbol of paradise. And as the use of any artistic work in representing man or animal was prohibited as well as being an act of Satan. Therefore we can understand clearly that the suggested use of such a statue for Regent as the central theme or the subject matter of Seventh Heaven 2 is prohibited and against the Islamic traditions and the values of the Egyptian population in the medieval period.

6.6.e THE TREATMENT OF THE EXTERNAL WALL

As we understand that the Egyptian Islamic building was planned to be internally protected from the sun and the intrusion of the external vision, the reason for which the orial was employed. Hence we find that using the glass material in the wide range shown as a treatment in the external walls of the Seventh Heaven is functionally not valid and to the mind of the Egyptian layman is perceptually unbearable, where such a mind seeks protection against the heat of the sun and spontaneously it evokes the shadow's image as a compensation for the weather's heat.

6.7 THE VALIDITY OF CONSTRUCTING THE SEVENTH HEAVEN IN OLD CAIRO AND THE LIMITS OF PERCEPTION

In this part I will be discussing the perceptual and the psychological implications which might arise as a result of establishing the scheme of the Seventh Heaven among the fabric of the medieval city of Cairo. The first perceptual impact expected to arise in such a situation is the 'contradiction' between the newly added scheme and the existing fabric of the old city. While such addition would establish a sense of novelty and peculiarity as a needed thing for our mental health and growth as the fourth limit of perception states, we can find on the other hand that this addition would establish a sense of contradiction; chaos; and disorder between both of the old and the newly added building, the things which are emotionally repellent and psychologically unacceptable, as the eighth limit states. As the form of the Seventh Heaven would be providing a sense of newness and uniqueness, we must therefore expect it to be dominating its setting; the thing which according to the ninth limit is emotionally satisfactory. Also, as that form will be establishing a sense of complexity and isolation in its visual vista, consequently, one would be expecting to perceive that difficulty, as the first and the second limits of perception state. While the form of the Seventh Heaven would be unique in its new environment, we can

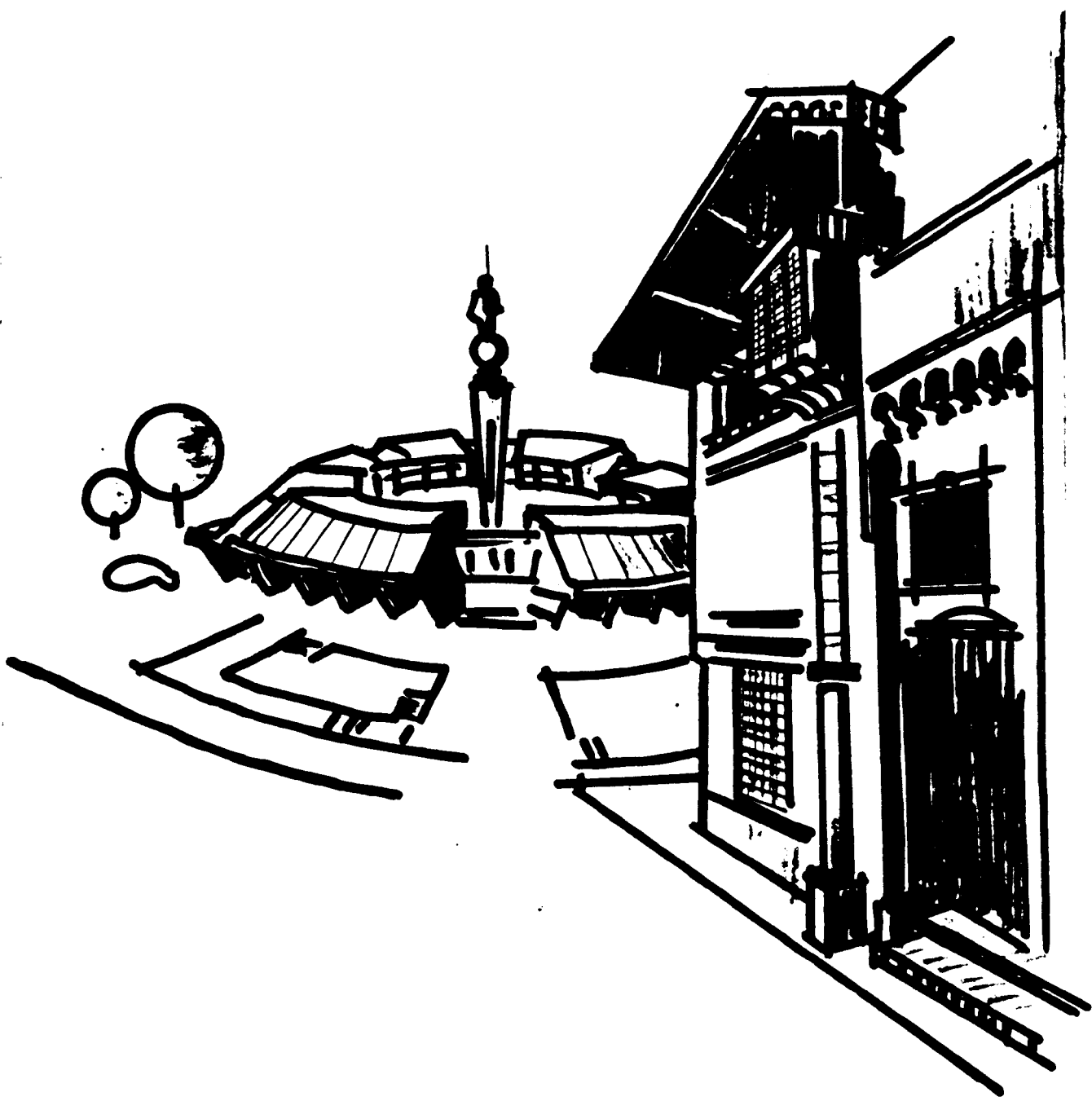


Fig. (6.34). Sense of Contradiction.
(Source: Prepared by the Researcher.)

understand that such a new addition would be the start of building a new schema for a new type of experience within the minds of the residents in the city of Cairo. It is an important fact also that such an addition in the medieval city of Cairo would harm the resident of this city psychologically and emotionally, where this addition will imply for him the destruction of his moral and ideological values which he used to see it in his artifacts and in his built environment.

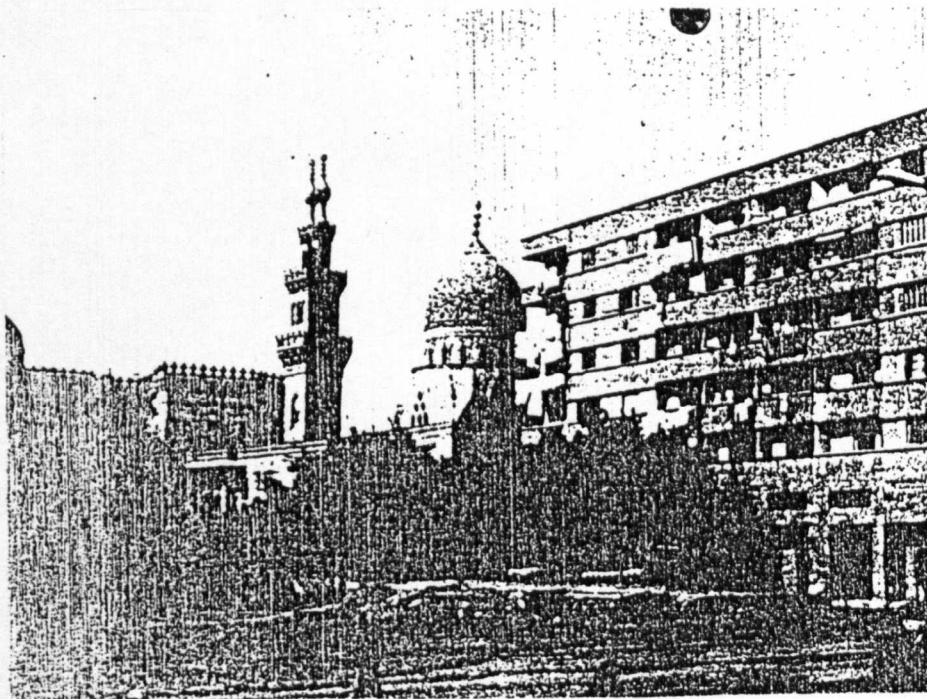


Fig. (6.35). The Citadel Square.
In this illustration one can perceive a
sense of isolation between the old and
the modern architecture.

(Source: Zaki, Mohamed, S. 1983, p.57.)

CHAPTER 6 NOTES AND REFERENCES

1. Evans, Elderd & Shalev, David, 'Seventh Heaven' (unpublished brief of the Seventh Heaven competition in Regent's Park in London, 1983).
2. Bacon, Edmund, N. Design of Cities (Thames and Hudson, London, 1967), p. 17.
3. Ibid, p. 189.
4. Briggs, Martin, S. Muhammadian Architecture in Egypt & Palestine (Da Capo Press. New York. 1974) pp.49 - 50.
5. See Hill, Derek & Golvin Lucien Islamic Architecture in North Africa (Faber & Faber Limited, London, 1976), p.35 and Goodwin, Godfrey, A History of Ottoman Architecture (Thames & Hudson, London, 1971)
6. Hoag, John D. Islamic Architecture (Harry N. Abrams, Inc., publishers, New York, 1977) p.13.
7. Briggs, Martin S. ibid, 1974, p.165.

