A Contemporary Assessment of the Genesis of the Modern Aesthetic – The Impact of Modern Art on Modern Architecture

by 'Ora Joubert

Submitted in fulfilment of the requirements for the degree of Doctor of Philosophy in Architecture, Faculty of Community and Development Disciplines, University of Natal, Durban, South Africa

1999

ABSTRACT

This dissertation assesses the impact of modern art on the so-called heroic period of modern architecture, dated for the purposes of this thesis from 1917 to 1933.

The study is premised on two principal arguments: firstly, modern art – Cubism, in particular – was the seminal influence on the codification of a modern architectural vocabulary. Secondly, the increasing preoccupation with utilitarian tenets obscured and ultimately undermined the semantic significance of modern architecture that was derived from the visual arts.

A general introduction to the tumultuous history of 20th century architecture substantiates these presuppositions and contextualizes the current interest in the aesthetic intent of the pioneering Modernists.

For the sake of reviewing the genesis of the modern aesthetic, the classical ideal of beauty is briefly reflected upon. This is followed by a review of the alternating depiction of pictorial depth and its extraordinary symbiotic relationship with the expression of plastic space.

The cubist-induced perception and experience of space is preceded by the catalytic role of the mechanization of vision on the rejection of the classical canons of beauty.

An in-depth analysis of Cubism, coupled with its derivatives that spawned architectural equivalents, reinforces the volumetric incarnation of modern art, exemplified by Purism, Constructivism and Neo-Plasticism.

This study is concluded with an assessment of the adopted premises and a reflection on the longer-term objectives of this study.

CONTENTS

PREFACE i

ACKNOWLEDGEMENTS ii

CHAPTER 1 GENERAL INTRODUCTION

1.1 Creative Endeavour as a Reflection of the Prevailing Paradigm 1
1.2 The Post-Industrial Paradigm 2
1.3 Heroic Modernism 3
1.3.1 Introduction 3
1.3.2 Rationalism 3
1.3.3 Functionalism 5
1.3.4 Socialism 5
1.3.5 The International Style 6
1.4 The Vilification of the Modern Movement 7
1.5 The Neo-Modern Alternatives 9
1.6 Academic Intent 10
1.7 Theoretical Strategy 12
1.8 Delineation and Clarification 13
1.9 Editorial Conventions 15

CHAPTER 2 THE CLASSICAL IDEAL OF BEAUTY

2.1 Preface 16
2.2 Introduction 16
2.3 The Legacy of Ancient Greece 16
2.3.1 The Decoding of Nature 16
2.3.2 Platonic Aesthetic Doctrine 18
2.3.3 The Classical Artistic Aspiration 20
2.3.4 The Vitruvian Confirmation 21
2.3.5 Nature as Design Precedent 22
2.4 The Reappraisal of the Classical Aesthetic 23
2.4.1 Introduction 23
2.4.2 The Renaissance 23
2.3.3 The Architectural Renaissance 24
2.4.4 Classical Architectural Theory 25
2.4.5 The Artistic Response 25
2.5 Summary 26

CHAPTER 3 THE COGNO-PERCEPTION OF SPACE

3.1 Preface 27
3.2 Introduction 27
3.3 The Algorithm of Linear Perspective 28
3.4 Curvilinear Perspective 29
3.5 Spatial Cogno-Perception 30
3.6 Alternating Cosmological Paradigms 31
3.7 The Pespectival Spatial Experience 34
3.8 Summary 35

CHAPTER 4 THE MECHANIZATION OF VISION

4.1 Preface 36
4.2 Introduction 36
4.3 Mechanization Takes Command 37
4.4 Aesthetics as Moral Dilemma 38
4.5 Stylistic Dissent 41
4.5 The Advent of Photography 41
4.6 The Aesthetic Logic of Modern Art 43
4.8 Towards the Reappraisal of Art 46
4.9 Summary 47

CHAPTER 5 CUBISM

5.1 Preface 48
5.2 Introduction 48
5.3 The Genesis of Cubism 49
5.4 Major Influences 50
5.4.1 Fauvism 51
5.4.2 African Art 51
5.4.3 Cézanne 52
5.5 Les Demoiselles d'Avignon 54
5.5.1 Introduction 54
5.5.2 Influences 55
5.5.3 Deductions 56
5.6 The Evolution of Cubism 62
5.6.1 Cézannian Cubism 62
5.6.2 Analytical Cubism 63
5.6.3 Hermetic Cubism 63
5.6.4 Synthetic Cubism 64
5.6.5 Crystalline Cubism 65
5.7 The Assimilation of Cubism 65
5.8 Criticism and Demise 66
5.9 Cubism, in Conclusion 68
5.10 Summary 69

CHAPTER 6 THE PICTORIAL DERIVATIVES OF CUBISM

6.1 Preface 71
6.2 Introduction 71
6.3 Kinetic Cubism: Futurism 72
6.3.1 Futurism as Cubist Derivative 72
6.3.2 Historical Overview 73
6.3.3 The Futurist Legacy 75
6.4 The Non-Figurative Propensity of Cubism: Abstract Art 76
6.4.1 Introduction 76
6.4.2 Orphism 76
6.4.3 Expressionist Abstraction 77
6.5 Geometric Cubism: Neo-Plasticism 78
6.5.1 Piet Mondrian 78
6.5.2 The Founding of De Stijl 79
6.5.3 Theoretical Premises 80
6.6 Planimetric Cubism: Neo-Plasticism 82

6.6.1 Kazimir Malevich 82
6.6.2 Rudimentary Suprematism 83
6.6.3 Dynamic Suprematism 84
6.6.3 Suprematist Application 84
6.7 The Pictorial Derivatives, in Conclusion 85
6.8 Summary 85

CHAPTER 7 "AFTER CUBISM": PURISM
7.1 Preface 87
7.2 Introduction 87
7.3 The Genesis of Purism 89
7.4 Ozenfant's Contribution 90
7.5 Purist Dogma 92
7.5.1 Purism as a Counteracting Artistic Initiative 92
7.5.2 *L'Esprit Nouveau* 93
7.5.3 Purist Artistic Theory 94
7.5.4 Purist Aesthetic Doctrine 100
7.6 Purist Painting 102
7.6.1 Introduction 102
7.6.1 Rudimentary Purism 104
7.6.2 Volumetric Purism 105
7.6.3 Fragmented Purism 107
7.6.4 Post-Purist Period 108
7.7 Purism, in Conclusion 109
7.8 Summary 110

CHAPTER 8 THE CORRESPONDENCE BETWEEN PURIST ART & PURIST ARCHITECTURE
8.1 Preface 112
8.2 Introduction 112
8.3 Period of Invention 114
8.3.1 Domestic Prototypes 114
8.3.2 *Vers une Architecture* 114
8.3.3 Purist Villas 115
8.4 The Correspondence Between Purist Art and Architecture 115
8.5 Formal Preoccupation 117
8.5.1 The Methodological Approach to Form 117
8.5.2 The Metaphysical Approach to Form 118
8.5.3 The Cubist Approach to Form 120
8.5.4 The Purist Approach to Form 121
8.6 Conceptual Reconciliation 122
8.7 Plastic Repertoire 124
8.8 Compositional Correlation 126
8.8.1 The Regulated Composition 126
8.8.2 Dom-Ino as Ordering Device 127
8.8.3 The Generating Surface 129
8.8.4 "Four Compositions" 130
8.8.5 The Classical Connection 131
8.9 Spatial Amplification 132
8.9.1 The Cubist Legacy Extended 132
8.9.2 The Architectural Assimilation of Space 133

8.9.3 The Spatial Paradox 135
8.9.4 Le Corbusier's Artistic Response to Space 137
8.9.5 Le Corbusier's Architectural Response to Space 138
8.10 Summary 143

CHAPTER 9 THE VOLUMETRIC TRANSFORMATION OF CUBO-FUTURISM: THE SOVIET AVANT-GARDE

9.1 Preface 145
9.2 Introduction 145
9.3 Futurist Sculpture 146
9.4 The Assimilated Soviet Response 148
9.4.1 Introduction 148
9.4.2 The Plastic Connection Extended 148
9.5 The Genesis of Constructivism 150
9.5.1 Introduction 151
9.5.2 Spatial Construction 151
9.5.3 Constructivist Production 152
9.6 Volumetric Suprematism 152
9.7 Rationalism and Symbolic Romanticism 155
9.8 Constructivist Architecture 157
9.8.1 Introduction 157
9.8.2 Theoretical Impetus 158
9.8.3 Methodological Impetus 159
9.9 The Demise of Constructivism 161
9.10 Constructivism, in Conclusion 164
9.11 Summary 165

CHAPTER 10 THE TECTONIC INCARNATION OF ABSTRACT ART: DE STIJL

10.1 Preface 167
10.2 Introduction 167
10.3 The Genesis of Neo-Plastic Architecture 168
10.3.1 Formative Period 168
10.3.2. The Zenith of De Stijl 171
10.4 From Elemental Painting to Elemental Construction 174
10.4.1 Theoretical Impetus 174
10.4.2 Colour, Composition and Space 175
10.4.3 Towards Collective Construction 176
10.5 Neo-Plastic Architecture 177
10.5.1 Formal Modulations via Vantongerloo 177
10.5.2 Volumetric Transformations via Van Doesburg and Van Eesteren 178
10.5.3 Four-Dimensional Decomposition 178
10.5.4 Rietveld's Spatial Constructs 180
10.5.5 Neo-Plastic Synthesis: Schröder-Schräder House 181
10.5.5 Neo-Plastic Successor: Mies van der Rohe 183
10.6 The Period of Transformation and Disintegration 184
10.6.1 Elementarism 184
10.6.2 The Demise of De Stijl 186
10.7 De Stijl, in Conclusion 188
10.8 Summary 189

CHAPTER 11 SUMMARY OF FINDINGS & CONCLUSIONS

11.1 Preface 191
11.2 The Unselfconscious Reversal to the Aspectival 191
11.3 The Impacting Role of Cubism on Modern Architecture 194
11.4 The Polemics of Functionalism 196
11.5 Conclusion 197

GLOSSARY 198

LIST OF ILLUSTRATIONS 209

BIBLIOGRAPHY 221

PREFACE

Doctoral research tends to be autobiographical. This study is no exception. In addition to a keen appreciation of modern art and a particular interest in the relationship between the visual arts and architecture, my involvement in academia has also contributed substantially to this undertaking.

The tuition of architectural design and theory has led to an increasing realization of the inconsistencies inherent in the aesthetic evaluation of contemporary architecture – seldom substantiated beyond subjective preference or ideological prejudice and, of late, even political correctness. Such value judgements are in part remnants of the legacy of the 20th century that autonomous aesthetic decisions are indicative of oppressive historicism or bourgeois preoccupations. These predispositions entirely disregard the fact that, since time immemorial, architects have been wrestling with the codification of aesthetic principles that govern sound design decision-making.

These ambiguities culminated in my quest for a systematic analysis of the aesthetic theory of Modernism, specifically, because the modern design idiom – whether in alliance or in opposition – remains the principal point of reference of all 20th century architecture.

Fortunately, enough time has lapsed to examine more objectively both the strengths and shortcomings of Modernism. I am of the opinion that as a result of much-debated failures of the Modern Movement, its principal contributions to the universal semantics of architecture have, until very recently, been lost sight of. I also maintain that Rationalism as design philosophy, Functionalism as design strategy and Socialism as political ideology were adopted as post-justifications for the codification of a novel design idiom; that Functionalism was erroneously equated with intrinsic aesthetic considerations, and that this equation was one of the primary reasons for the vilification of modern architecture. In fact, my research indicates that the genesis of modern architecture owes a great deal more to artistic pursuit and sensory gratification than scholars of architecture would generally care to admit.

This thesis, firstly, advocates a reappraisal of the unique space-time dimension, corresponding tectonic innovations, and abstract formalism that were derived from artistic experimentation.

Secondly, in view of the prevailing neo-modern genre – and given the tumultuous history of modern architecture – this study aims at an accountable assessment of this current manifestation *à propos* its progenitor.

Thirdly, this study is motivated conclusively from a designer's point of view and is testimony to an unwavering commitment to the art of architecture.

The vastness of the topic, coupled with the synthesis of two autonomous academic disciplines, led, unwittingly, to the encyclopaedic nature of this undertaking. Notwithstanding, the conclusions drawn from this study are intended for practical implementation. This endeavour is intended to aid both tutor and learner, enable a better understanding of a highly complex discipline and, hopefully, contribute to the expansion of a personal design repertoire.

ACKNOWLEDGEMENTS

My sincere appreciation to the Human Sciences Research Council for financial assistance; Tildie Williams for editing this manuscript; my supervisor and co-supervisor, Professors Walter Peters and Denis Radford, for their academic guidance; Dr Roger Fisher, my dear friend and respected academic, for his invigorating discourse; Kobus van Zyl, for his assistance in the compilation of the graphic material; David Winer, for his moral support; and Professor Pancho Guedes, who not only showed a keen interest in this study but also practises the art of architecture. My past and present students also share in this accomplishment as their persistent enquiries stimulated the quest for clarity and comprehension.

Hierdie studie word, ten slotte, opgedra aan beide my ouers: my moeder sonder wie se emosionele asook finansiële bystand hierdie taak nooit sou gerealiseer het nie; en ter nagedagtenis aan my vader, Prof. Daniel Malan Joubert, wie se uitnemende akademiese loopbaan en besonderse liefde vir die beeldende kunste vir my 'n deurlopende aansporing was en sal bly.

CHAPTER 1 GENERAL INTRODUCTION

1.1 CREATIVE ENDEAVOUR AS A REFLECTION OF THE PREVAILING PARADIGM

> "Man encodes his artefacts with the ideas generated within the prevailing paradigm. His art reflects such patterns of encoding and constitutes the 'style' of the artefact. The prevailing paradigm therefore not only directs the scientific pursuit, but also artistic endeavour. The style of artistic expression is thus a reflection of the prevailing paradigm." (Fisher, 1989: 10)

All forms of creative endeavour can be qualified as the manifestation of cerebral activity that reflects the prevailing circumstances of our existence within the total sphere of the human experience. Human thought encompasses a knowledge of the past, the present and even the anticipated future, but projected from a specific point in time. The prevailing circumstances are endorsed by that particular moment of mental conception. This premise implies that the diverse range of creative expression is bound, irrevocably, to a context of time and place, encapsulated in the notion of *Zeitgeist*.

The past three centuries of Western history have been an epoch of tumultuous change, culminating in a renunciation of the past, the rejection of tradition and the revision of codes of conduct. In terms of the aforegoing definition, the artistic and architectural realizations from the 20th century serve as profound evidence of this radical process of transformation.

The visual arts – the optical manifestation of cerebral activity – were in the forefront in reflecting the *Zeitgeist* of the industrial paradigm and were, moreover, forced to review the credibility of their disciplinary pursuits to a far greater extent than any of the related art forms. The Industrial Revolution and the resultant host of inventions it set in motion – mechanical reproduction, in particular – not only threatened the role of the artist in society, but challenged also the definition of art *per se*. The artistic endeavour collectively identified as modern art – commencing from 1863 – represents, as much as it illustrates, this induced metamorphosis of the human condition. This manifested in the portrayal of new physical realities – of new subject matter. But, more importantly, it altered our perception of reality – whether or not reality ought to be defined strictly in terms of optical perceptibility – and questioned its means of communication. Existing pictorial traditions and techniques were soon considered insufficient and inappropriate. They were ultimately rendered obsolete, leading to the inevitable confrontation with the customary and, by implication, classical canons of beauty.

In the quest for expressing new cognitive insights, artistic experimentation extended the boundaries of our optical reality through an extended scale of vision that explored the depths of both the human experience and the human psyche. This materialized not only in pictorial terms, but also through psychological, intellectual and emotional impact. The implications of these experiments were so vast that they had to influence all the related creative arenas, not least of all architecture – considered the 'mother' of the arts.

The ensuing artistic explorations impacted significantly on the semantic codification of what in time became known as modern architecture. In addition to drastically altering aesthetic perception and appreciation, modern art introduced a process of abstract conceptualization that manifested in new modes of plastic expression and spatial resolution.

1.2 THE POST-INDUSTRIAL PARADIGM

> "The term 'postmodern' has been appropriated throughout the disciplines and has been associated, not with a stylistic movement, but rather an inherent discomfort in the relationship of Western man with the premises of his thinking." (Fisher, 1989: 27)

Contemporary French philosopher Jean-François Lyotard (1984:10) maintains that the current age, dating from 1960, encompasses a critical scepticism which he considers indicative of the so-called post-modern condition. According to Samuel Toulmin in *The Return to Cosmology, Postmodern Science and the Theology of Nature* (1982: 100):

> "... if we are irremediably stuck with the existing academic divisions of historical time, we must reconcile ourselves to a paradoxical-sounding thought: namely, the thought that we no longer live in the 'modern' world. Our own natural science today is no longer 'modern' science. Instead ... it is rapidly engaged in becoming 'postindustrial' science; the science of the 'postmodern' world, of 'postnationalistic' politics and 'postindustrial' society – the world that has not yet discovered how to define itself of what it is, but only in terms of what it has just-now-ceased to be."

It has since been accepted that the paradigm designated to the two hundred-year period following the genesis of the Industrial Revolution (c. 1760) had been surpassed by the post-industrial – or post-modern – specifically, in relation to the developed world.

Such a scenario – "an incredulity towards metanarratives" (Fisher, 1989: 28) – signifies a fundamental shift in Western thought from an autocratic, dogmatic position to a far greater degree of flexibility and facilitation which encourages an inclusive pluralism. We evidently live in a sceptical age in which "consensus politics has a fragile existence and the authority of any group, ideology or individual has a limited period of leadership" (Jencks, 1988: 27). It is speculated that this condition may be permanent, given "the decline of unifying religious and social ideologies and the rise of [a] critical scepticism and other types of rationalities" (*ibid.*). Roger Fisher (1989: 28) paraphrases the prevailing post-modern paradigm as "a move away from the cohesive structure of the Newtonian paradigm to a state of being which tolerates a notion that certain experiences are irreconcilable and unquantifiable".

Charles Jencks, the Linnaeus of contemporary architectural history, argues that this sense of tolerance has been extended to architecture. As the major proponent of a pluralistic style and credited with the codification of the post-modern architectural language, Jencks has during recent years been advocating a stylistic pluralism in architecture. In the aptly entitled article "Late-Modernism vs Post-Modernism: The Two-Party System" (1988: 27), Jencks proposes that neither movement assumes the dominant position:

> "...underlying the constant change, the insult-go-around of architectural politics, are two basic traditions which I have called the Late-Modern and Post-Modern approaches. Both, as one would guess, try to make sense of an earlier Modern architecture that has lost its direction ... but neither enjoys the power and status of its predecessor ... Pluralism rules ... Architects, critics and the public are becoming ever more agitated and confused about this acrimony, but it is a small price to pay for the pluralism and what now amounts to a balance of power between the two reigning approaches. In fact it has started to create something very positive ... the equivalent of the two-party system set in permanent opposition, something that allows further parties to emerge and many previously quiet voices to be heard."

The departure from advocating a singular, though admittedly inclusive, pluralistic style (the so-called double-coded, multi-valent Post-Modernism) to embracing a stylistic pluralism is significant. The acceptance of a two-party – or rather, a multi-party – democracy of architectural expression encourages, instead, a pluralistic ethos. Such a position acknowledges the existence of the plethora of stylistic alternatives. Presumably, these different design approaches are considered equally legitimate responses to the built environment, but with architectural merit and appropriateness, hopefully, evaluated in terms of the selected response to the particular set of contextual circumstances. Philip Johnson (1988: 8), himself prone to stylistic metamorphosis, endorsed this notion of a pluralistic ethos when he made the following statement:

> "No generally persuasive '-ism' has [yet] appeared. It may be none will arise unless there is a world-wide, new religion or set of beliefs out of which an aesthetic can be formed. Meanwhile pluralism reigns, perhaps a soil in which poetic, original artists can develop."

Ironically, this inclusive and, by implication, democratic approach adopted in both the practice and assessment of contemporary architecture concurs with the demise of Communism and the determination to move towards a global political democracy. This pluralistic approach – a 'stylistic' democracy – fostered by the prevailing post-industrial paradigm, is a far cry from the univalent and authoritarian stance adhered to by the pioneers of modern architecture that adumbrated its discourse at the beginning of the 20th century.

1. 3 HEROIC MODERNISM

1.3.1 Introduction

Akin to the visual arts, the heroic period of modern architecture – dated for the purposes of this study from 1917 until 1933 – was characterized by the investigation and delineation of new conceptual premises – technological, methodological, formal and ideological. The proposal of a utilitarian and socially responsible architecture – where form, supposedly, follows function – was ultimately considered the most appropriate, though exclusive, response to the then-prevailing industrial (modern) paradigm. In hindsight, these noble intentions were more than justified. Not only in response to the bewildering demands spawned by the Industrial Revolution, but, and equally important, in naive anticipation of the new societal order that professed equality to all mankind. In due course, Rationalism as philosophical credo, Functionalism as design strategy, and Socialism as political dogma were adopted as the conceptual essence of a contemporaneous architectural expression.

1.3.2 Rationalism

Rationalism as an architectural concept – according to which structural and utilitarian efficiencies determine formal expression – has permeated theoretical discourse since the early 18th century. The political and religious dissent engendered by the Enlightenment (c. 1760-1850) propelled the architectural profession of the day to revise the excess of Baroque and Rococo, and to initiate a more 'precise' reappraisal of antiquity than had previously been attempted. (Evidently, Renaissance Classicism was considered a subjective appropriation thereof.) The culminating attempts – qualified as Neo-Classicism – coincided with pertinent theoretical enquiries made by a contingent of French scholars of architecture.

In *Modern Architecture: A Critical History* (1980: 12-19), architectural historian Kenneth Frampton traces the genesis of a rational approach to architecture to amateur architect Claude Perrault (1613-1688) and his questioning of the universal validity of classical doctrine in *Vitruvius*, published in 1673. This challenge was pursued by Abbé Jean Louis de Cordemoy (1651-1722) who encouraged a search for "truth and simplicity" in architecture in his *Nouveau Traité de Toute l'Architecture* (1706)

De Cordemoy argued that the purpose of a building should be expressed in its formal realization and that ornamentation should be subject to propriety. Abbé Marc-Antoine Laugier (1713-1769) endorsed this disposition in his famous *L'Essai sur l'Architecture* (1753), though asserting that primordial form, devoid of all superfluousness, should serve as precedent for the truthful, even economical, expression of shelter.

Apart from the archetypal explorations of the so-called visionary architects of the 18th century, the rationalist quest manifested also in the architecture of Henri Labrouste (1801-1875) and the theories of Eugène-Emmanuel Viollet-le-Duc (1814-1879). Labrouste, generally cited as the first proponent of a structural Rationalism of the neo-classical genre, insisted on the primacy of construction and the avoidance of ornamentation as demonstrated consistently in his work. By contrast, Viollet-le-Duc's investigations of Gothicism reaffirmed the necessity of a rational – even regional – approach to architecture. Viollet-le-Duc stated his convictions in *Entretiens sur l'Architecture* (1872) as follows:

> "In architecture, there are two necessary ways of being true. It must be true according to the programme and true according to the methods of construction. To be true according to programme is to fulfil exactly and simply the conditions imposed by need; to be true according to the method of construction, is to employ the materials according to their qualities and properties ... purely artistic questions of symmetry and apparent form are only secondary conditions in the presence of our dominant principles." [Emphasis as quoted from Frampton, 1980: 64.]

Although ardently committed to the spirit of his age, Viollet-le-Duc's own architectural designs – save for an eloquent comparison between Gothicism and 19th century cast iron skeletal structure [1] – did not amount to much. However, his declarations and implicit cultural nationalism were persuasive in those countries where the classical influence was relatively minimal, or nationalistic sentiments particularly pronounced – hence his impact in Catalonia, Belgium, the Netherlands and Scotland. Viollet-le-Duc's legacy culminated in the genesis of Art Nouveau – the first architectural idiom since the Middle Ages not derived from any historical precedent. The declaration of intent by the Société Centrale d'Architecture de Belgique (the Belgian contingent of Art Nouveau), published in *L'Emulation* in 1872, endorses Viollet-le-Duc's overwhelming influence on their novel design enterprise:

> "We are called to create something which is our own, something to which we can give a new name. We are called upon to invent a style." (Frampton, *ibid.*: 67)

The rationalist tradition persisted, pervading also the assessment of architectural history. In *Histoire de l'Architecture* (1899), French engineer and author Auguste Choisy (1841-1904) insisted that stylistic transformations were merely the logical consequence of technological development. Choisy was eminently critical of Art Nouveau and questioned its excessive decorative embellishment. His stance found due support in Adolf Loos (1870-1933), whose controversial article "Ornament und Verbrechen" (Ornament and Crime, 1908) slated the Austrian derivative of Art Nouveau, entitled Secessionism (1886-1912).

Choisy's theories excercised a substantial influence on the unique concrete constructions of Auguste Perret (1874-1954) and also on the so-called elementarist housing proposals of Tony Garnier (1869-1948) for his visionary Cité Industrielle project of 1904 – examples that were synthesized by the pioneering modern architects, though responding to an amalgamated rationalist philosophy according to their particular ideological dispositions.

---

1 With reference to Viollet-le-Duc's seminal work *Dictionnaire Raissoné de l'Architecture Française*, published between 1854 and 1868.

1.3.3 Functionalism

Functionalism, an obvious extension of a rationalist design philosophy, is not only the most contentious aspect of modern architecture, but its academic origin – in a modern context – is also in dispute. Inevitably, the practical aspects of architecture have always been an overriding consideration in the realization of any built structure. During the 20th century, the denotation presumably gained currency due to the slogan "form follows function", generally held to have been coined by Louis Sullivan (1856-1924) in his essay "Ornament in Architecture" of 1892. Reyner Banham makes the following comment in *Theory and Design of the First Machine Age* (1960a; 1996: 320):

> "By the middle of the Thirties it was already common practice to use the word 'functionalism', as a blanket term for the progressive architecture of the Twenties ... Yet ... it is doubtful if the ideas implicit in Functionalism – let alone in the word itself – were ever significantly present in the minds of the influential architects of the period. Scholiasts may care to dispute the exact date on which this misleading word was first used as the label for the International Style, but there is little doubt that the first consequential use was in Alberto Sartoris's book *Gli Elementi dell'architettura Funzionale*, which appeared in Milan in 1932."

Alison and Peter Smithson also refer to the belligerence of Functionalism in *The Heroic Period of the Modern Architecture* (1981: 70):

> "In the 1930s, through some phenomenon that is too complicated to understand properly, something called functionalism superseded all the separate and distinctive flavours of the heroic period. By functionalism was meant the abolition of ornament and the abandoning of pitched roofs and the Orders. The stylistic void thus created was somehow to be filled by function and sociology. In this way, a rejection of style (and with it consistency and the concept of architecture) and a misrepresentation ... came to represent Modern Architecture to a generation who never really knew what the original excitement was all about."

It is submitted that it was due to the methodological connotation that Sullivan ascribed to function that enforced its strategic implication and subsequent adoption as the primary generator for a modern architectural expression.

Functionalism was, though, subjected to divergent interpretation. Its appropriation ranged from an organic Functionalism developed by Frank Lloyd Wright (1869-1959), to the machine-inspired, though intrinsically metaphysical, Functionalism laboriously promulgated by Charles-Èduard Jeanneret-Le Corbusier (1887-1965), to the pragmatic Functionalism [2] propagated by the protagonists of Marxism – particularly the adherents of Constructivism (1919-1932) and the Neue Sachlichkeit (1923-1933). The mid-1950s saw the introduction of a 'humane' Functionalism in a concerted effort to regain the credibility lost through indiscriminate application. Ironically, this attempt coincided with the Hungarian Uprising of 1956 and the ensuing concessions made by the political oligarchy to 'humanize' Communism.

1.3.4 Socialism

By the late 1920s and early 1930s, Functionalism had become synonymous with socialist aspirations and the Marxist ethos of production. Any aesthetic considerations independent of utilitarian performance were repudiated as antiquated, considered politically suspect and regarded as

---

2 Serenyi, P. (ed.), 1975, *Le Corbusier in Perspective* (New Jersey: Prentice-Hall), 4, uses the term "pragmatic utilitarianism" to describe the architectural approach of the exponents of the Neue Sachlichkeit.

technologically stifling. [3]

Although the incubatory period of Heroic Modernism entailed the codification of a formal language derived from artistic experimentation, all design decisions were soon verified, or altogether abandoned, by the overruling functionalist premise and socialist agenda. This becomes apparent when one reviews the curricular development of the academic institutions in the Soviet Union and at the Bauhaus (1991-1933), and also the evolution of the Dutch movement, De [de] Stijl (1917-1931). In all these instances, the initial enthusiasm for the novel modern aesthetic was surpassed, conclusively, by utilitarian and social considerations. Within this context, it is worth considering the undated remark [4] by one of the founder members of De Stijl, Jacobus Johannes Pieter Oud (1890-1963):

> "... through the process of decomposition I gained a new sense of proportion, of space ... but I abandoned it to move in another direction: a healthy, broad, universal, social architecture."

Even Gerrit Rietveld (1888-1964), whose Schröder-Schräder House, Utrecht (1924), epitomized the novel De Stijl aesthetic, had by 1927 rejected all formal explorations modelled on painterly experimentation (see Chapter 10). The comment by German architect Bruno Taut (1880-1938) in *Modern Architecture* (1929: 9) summarized the pervading attitude:

> "If everything is founded on sound efficiency, this efficiency itself, or rather its utility will form its own aesthetic law."

1.3.5 The International Style

Despite the pioneering Modernists' methodological (versus stylistic) approach to architecture, the Weissenhofsiedlung, Stuttgart, of 1927, demonstrated a collective implementation of the white, prismatic, flat-roofed mode of building that was identified, sardonically, as the "International Style". The exhibition entitled "Modern Architecture: International Exhibition", hosted at the Museum of Modern Art (MoMA) in New York in 1932, coincided with the publication of the book *The International Style: Architecture Since 1922* by Henry-Russell Hitchcock (1903-1987) and Johnson, whereupon both phrase and design idiom gained currency. In the preface to this influential book, Alfred H. Barr Jr (1902-1981), the first director of MoMA, provides the following description:

> "The distinguishing aesthetic principles of the International Style as laid down by the authors are: emphasis upon volume – space enclosed by thin planes or surfaces as opposed to the suggestion of mass and solidity; regularity as opposed to symmetry or other kinds of obvious balance; and lastly, dependence upon the intrinsic elegance of materials, technical perfection and fine proportions, as opposed to applied ornament. " (Hitchcock and Johnson, 1932; 1995: 29)

The Smithsons (1981: 9) add the following characteristics:

> "a) cubic, or appeared to be carved out of cubes; b) geometrically organized and highly abstract in its interpretation of human activities; c) a complete thing in itself; d) was poised, not rooted to its site; e) was usually white or brightly coloured, or made of shiny materials; f) natural materials, when used, appear to be substitutes for artificial materials not yet invented."

---

3 With reference to the utterances by the proponents of Constructivism and the Neue Sachlichkeit. See Kahn-Magomedov, S., 1987, *Pioneers of Soviet Architecture – The Search for New Solutions in the 1920s and 1930s*, trans. Lieven, A. (New York: Rizzoli); and Frampton, K., 1980, *Modern Architeture: A Critical History* (London: Thames & Hudson), 130-141.

4 An extract from an undated letter Oud wrote to Bruno Zevi and of which this translation appears in Benevola, L., 1971. *The History of Modern Architecture, Vol. 2* (Cambridge, Mass.: MIT Press), 20.

1.4 THE VILIFICATION OF THE MODERN MOVEMENT

The unprecedented political interference during the early 1930s in all fields of creative expression by both Stalin and Hitler [6] – although approached from diametrically opposed ideological positions – dampened the initial fervour of a unifying, contemporaneous architectural language. It was only after the Second World War that the theoretical postulates of the Heroic Modernists found large-scale implementation. [7] Due to its functionalist tenets and sustained emphasis on standardization and prefabrication, modern architecture was adopted as the most economically-viable solution to the dire need for built structures arising from the devastation of war.

However, the enthusiastic reception of Modernism was short-lived. This was, foremost, as a result of the perception that its design repertoire was restricting and creatively inhibiting. Even Le Corbusier modified his own modernist vocabulary as early as 1930, and more radically after the Second World War. Towards the end of his career, Le Corbusier's expanded architectural inventory included surface embellishment, tactile modulation and a resort to biomorphic analogies. The design of La Chapelle Notre-Dame-du-Haut, Ronchamp (1954), represents the most fundamental deviation from his so-called "5 Points d'une Architecture Nouvelle", published at the zenith of Heroic Modernism in *Almanach d'Architecture Moderne* in 1925/6.

Moreover, and contrary to expectations, the assumption (based on the socialist idealism of the 1920s) that a univalent architectural application would produce a satisfactory and hygienic built environment proved horribly naive. The socially-inspired architecture also lost its appeal as a result of the middle-class affluence experienced in both Western Europe and the USA. Ironically, the functionalist premise was exploited for capitalistic purposes, and was soon equated with minimum quality and maximum profit. The urban utopia became a grim reality, impinging increasingly on the quality of human life. In the words of Frampton (1980: 9):

> "[Modern] architecture has, of course, played a [substantial] role in the impoverishment of the environment – particularly where it has been instrumental in the rationalisation of both building types and methods, and where the material finish and the plan form have been reduced to their lowest common denominator, in order to make production cheaper and to optimize use."

The disenchantment displayed by the second generation of modern architects towards the utopian rhetoric of their predecessors culminated in the dissolution of the vanguard of Modernism – the

---

6 According to Brown, M., 1991, *Art Under Stalin* (Oxford: Phaidon), 27, Lenin never took kindly to the "absurd and perverted taste of Futurist [modern] art". However, it was Stalin who finally outlawed all forms of modern expression on 23 April 1932.

Antagonism towards Modernism – labelled Bolshevik art – had been a consistent feature of Hitler's speeches during the 1920s, but Nazi cultural policy only became official in 1929. The so-called *Kampfbund für Deutsche Kultur* aimed at eradicating all traces of Modernism, and promoted Germanic art and culture. The Bauhaus, in particular, had been under severe attack ever since its inception and was finally forced to disband on 19 July 1933. The "Degenerate Art Exhibition", hosted in Munich in 1937, served as the most vivid demonstration against Modernism. Hochman, E., 1989, *Architects of Fortune: Mies van der Rohe and the Third Reich* (New York: Weidenfeld & Nicolson), 295, states that 1 400 artists and more than 17 000 works of art were declared degenerate. These were promptly confiscated and severe penal measures were implemented.

7 Although most of the earliest examples of modern architecture were of a domestic scale and patronized by courageous individuals, some larger projects were built prior to the Second World War. The most notable included the housing developments at Liège (1924/5) and Pessac (1925) by Le Corbusier; Kiefhoek Housing, Rotterdam (1925), by Oud; the Bauhaus Complex, Dessau (1926), by Gropius and Neufert; the Zonnestraal Sanatorium (1928), Hilversum, by Bijvoet and Duiker; and the Narkomfin Apartments, Moscow (1929), by Ginzberg.

Congrès International d'Architecture Moderne (CIAM) – in 1959, [8] and countering initiatives by Team X and like-minded dissidents. Although Le Corbusier had expanded his purist design repertoire long before, the desecration of his utopian visions caused him severe anguish. In a letter, assumed written to the governing committee of the CIAM in response to the Dubrovnik convention of 1956, Le Corbusier laments:

> "It is those who are now forty years old, born around 1916 during wars and revolutions, and those then unborn, now twenty five years old, born around 1930 during the preparation for a new war and amidst a profound economic, social, and political crisis, who thus find themselves in the heart of the present period, the only ones capable of feeling actual problems, personally, profoundly, the goals to follow, the means to reach them, the pathetic urgency of the present situation. They are in the know. Their predecessors no longer are, they are out, they are no longer subject to the direct impact of the situation." (Frampton, 1980: 271-272)

The discrediting of the pioneering initiatives of the Heroic Modernists continued relentlessly during the 1960s and 1970s, exacerbated by the Middle-Eastern energy crisis. The proliferation of literature that questioned both the integrity and intentions of the Modern Movement – most notably Robert Venturi's *Complexity and Contradictions in Architecture* (1966), Brent Brolin's *The Failure of Modern Architecture* (1976), Peter Blake's *Form Follows Fiasco* (1977) and even the audacious *Learning from Las Vegas* (1972) by the Venturi couple – bears testimony to the general state of despair, disillusionment and confusion that prevailed in the architectural arena for close on two decades. The anti-modernist campaign amplified, respectively, the commitment to elitist preoccupations despite socialist pretensions; technological shortcomings committed in the name of rationality and utility; the general disregard for both human and natural resources; the insensitivity displayed towards historical fabric; and the ignorance of human behaviour.

Although, Brutalism and the idiosyncratic Neo-Expressionism, exemplary of the 1950s, managed to resuscitate some creative energy, no one could anticipate the radical design alternatives that were introduced from the 1960s onwards. These included: the celebration of a technological consumerism and the design of so-called mega-structures; 'high-tech' explorations that extended the visions of the Bauhaus contingents, but realized via sophisticated detailing and sustained by free-market enterprise; the investigation of 'alternative' and ecologically sensitive technologies; the appraisal of vernacular endeavour, the call for the rejuvenation of the built environment and the fostering of an architectural contextualism; the encouragement of user-participation and the reconciliation of an architectural elitism with popular culture; and the investigation into the communicative potential (or semiotic properties) of architecture that culminated in a revived eclectic historicism. In all these instances the objectives were to counter the much-debated failures of the Modern Movement, develop an alternative design repertoire that would imbue the built environment with a measure of visual vibrancy, and restore the integrity of architecture *per se*.

The dramatic implosion of the Pruitt Igoe Housing Estate, St. Louis, Missouri, at 3.32 pm, 15 July 1972, symbolized the supposed death of Modernism – albeit somewhat prematurely. [9]

---

8 The tenth and last official CIAM convention was held at Dubrovnik in 1956, but was followed by another meeting hosted at Otterlo in 1959. This later meeting signalled the demise of CIAM, whereafter Team X dominated all further initiatives hosted during the 1960s.

9 With reference to Jencks, C., 1977, *The Language of Post-Modern Architecture* (New York: Rizzoli), as proclaimed retrospectively. According to Glusberg, J. (ed.), 1991, "Deconstruction – A Student Guide", *UIA Journal of Architectural Theory and Criticism* (London: Academy Editions), 9, Philip Johnson had already declared modern architecture "dead" in 1959 at a convention hosted by the American Institute of Architects. Johnson maintained that the Seagram Building, New York, completed in 1958, was its "final product".

1.5 NEO-MODERN ALTERNATIVES

By the end of the 1970s, it was possible to identify two opposing design approaches that each adopted a specific position with regard to the controversy surrounding modern architecture. It is noteworthy that any semantic oversimplification (an euphemism for style), particularly of contemporary architecture, is prone to contention. However, until time proves them otherwise, the following distinctions and popular terminology have to suffice.

"The Presence of the Past", the celebrated theme of the 1980 Venice Biennale, was indicative of the dominant position that Post-Modernism seemed to have assumed. By contrast, the Parisian buildings that materialized through international competition in celebration of the bicentennial of the French Revolution in 1987 signalled a distinct bias towards Late-Modernism (evidently, providing additional impetus for advocating a pluralistic tolerance).

Despite the raging anti-modernist campaigns, a contingent of American architects – the so-called New York Five – persisted since the early 1960s in their pursuit of the spatial and formal integrity of the International Style (irrespective of the defection of one of its most eloquent members, Michael Graves, to Post-Modernism in more recent years). The mid-1980s also saw a resurgence of interest in the creative endeavours of the Soviet avant-garde which had never been brought to fruition. Amidst an increasing disenchantment with the superciliousness of Post-Modernism, the creative exuberance demonstrated by the pioneering Soviet architects found a receptive audience among those who, yet again, were seeking semantic alternatives.

The New York Five (also known as the Twenties Revivalists) and the so-called Deconstructivists are of particular relevance to this study. Collectively known as the "Neo-Moderns", they are said to explore, even exploit, the latent potential of the original modern aesthetic. According to Johnson and Wigley (1988: 16), the prevailing neo-modern aesthetic is "one which the Russian avant-garde made available but did not take advantage of". At present, Neo-Modernism is considered to refer to a rebirth, or a revival, of the modern aesthetic, presupposing a "true" assessment of Heroic Modernism. According to Jencks (1988: 32), the prefix "Neo" suggests that the Modernist aesthetic "has lapsed for a period and its revival is accompanied by the statement of a new version of the older philosophy". This is a position that neither Post-Modernism, nor Late-Modernism – according to popular definition – can assume. Since Post-Modernism encourages a reappraisal of historicism within a modern context, it epitomizes the antithesis of orthodox modernist intentions. Its pluralistic design idiom reaffirms this paradox which simultaneously justifies its own validity. By contrast, the Late-Modernists disdain all historical reference. Instead of promoting a revival of modern aesthetic premises, the Late- Modernists resort to a technological extremism and structural innovation, though, without succumbing to any established design precedent.

In conclusion, with the exception of the recent neo-modern developments, none of the architectural explorations that followed the Second World War were aimed at extending the formal and spatial investigations of the Heroic Modernists. Instead, the modern design repertoire was expanded through a variety of alternative means that were extrinsic to the original aesthetic intentions of the Modern Movement, and to which even its pioneering proponents had contributed. In view of the resuscitation of the aesthetic precepts of Heroic Modernism, it can be concluded that its design repertoire was never as creatively restrictive as was assumed. Moreover, Heroic Modernism can be explored and be expanded upon without adhering to a particular political or ideological disposition.

1.6 ACADEMIC INTENT

A Contemporary Assessment of the Genesis of the Modern Aesthetic – The Impact of Modern Art on Modern Architecture.

This thesis aims at a historical review of the genesis of the modern aesthetic, re-assessing the impact of modern art on the heroic period of modern architecture. The term "modern aesthetic" refers to the abstract formalism, unique space-time dimension, and corresponding tectonic innovations that evolved from artistic experimentation.

This study is premised on the following principal arguments:

1. The visual arts provide a plausible model for tracing the evolution of architecture.

2. The depiction of pictorial depth coincides with, and even pre-empts, the expression of plastic space.

3. Modern art – Cubism, in particular – was the seminal influence on the codification of a modern architectural vocabulary.

4. The increasing preoccupation with utilitarian tenets obscured and ultimately undermined the semantic significance of Heroic Modernism that was derived, conclusively, from the visual arts.

The presupposition that modern art exerted a considerable impact on the crystallization of early 20th century architecture is by no means an exclusive point of view. Most scholars of architecture acknowledge this symbiotic relationship, but few elaborate on this premise. In a recent collection of essays, published as *Architecture and Cubism* (1997: 1), editors Eve Blau and Nancy Troy point out:

> "It is the one of the central, if largely untheorized, tenets of the history of modern architecture that cubism [modern art] forged a vital link between avant-garde practices in early twentieth-century painting and architecture."

Peter Collins rightfully remarks in *Changing Ideals in Modern Architecture* 1670-1950 (1965; 1998: 278) that the "precise nature of the [artistic] influence is so complex that it demands more than a cursory examination", but he, too, did not provide substantial supporting evidence in this regard.

Generally-speaking, De Stijl is the one architectural initiative that is consistently singled out as exemplary of this corresponding relationship. This is obviously due to the striking similarities between neo-plastic compositions of Piet Mondria[a]n (1872-1944) and the earlier architectural realizations of Rietveld.

Significantly, and despite Le Corbusier's incessant reference to the exploratory role of his artistic output, this seminal influence on his architecture is an aspect conspicuously underestimated or entirely overlooked by academics reviewing his work. But for scant reference and rare exceptions, [10] Le Corbusier's artistic and architectural accomplishments are examined independently by art historians and architectural theorists alike. In the essay "Structure and Play in Le Corbusier's Art Work" (1996: 4) – a synopsis of a doctoral study based on Le Corbusier's paintings after 1940 – Jamie Coll shares this authors opinion:

---

10 One of the few publications encountered in this regard is Reichlin, B., 1997, "Jeanneret-Le Corbusier, Painter-Architect", in Blau, E. and Troy, N., *Architecture and Cubism* (Montréal: Canadian Centre for Architecture), 195-218.

> "Le Corbusier's artistic production ... remains largely unknown and its relation to the architecture and urban projects has not adequately been explored ... There are few critical studies of Le Corbusier's work as an artist. Twentieth century art historians such as Giedion, Summerson, Banham, Rowe and Slutzky, von Moos, J. Petit, and Tafuri and Dal Co make occasional reference to the paintings, but while acknowledging the importance of the work they found it difficult to determine the relation between the paintings and the architecture."

Modern Soviet architecture serves as another case in point. Not only did all the pioneering architectural movements in the USSR between 1919 and 1932 evolve from intent artistic experimentation, but the justification sought in a social utilitarianism invalidated the significance of the originating aesthetic precedent.

Of late, the historiography of modern architecture is posited on technological, socio-political, philosophical or semiotic tenets and to a far lesser extent on artistic premises. The notable exception is *Space, Time and Architecture: The Growth of a New Tradition* (1941; 1967: 436) by Sigfried Giedion (1888-1968) – the one architectural historian to acknowledge most comprehensively the seminal artistic influence on the genesis of Heroic Modernism, specifically regarding Cubism and its "self-conscious enlargement of perceiving space". In this work, Giedion (*ibid.*) states explicitly that he only refers to "contemporary movements in art ... only so far as their methods are directly related to the space conceptions of our period, and in order to understand the common background of art, architecture and construction".

On the authority of Blau and Troy (1997: 2), Henry-Russell Hitchcock's *Painting Toward Architecture* of 1948 was the only publication until the 1960s (assuming in English) that dealt exclusively with the connection between modern art and modern architecture. Unlike Giedion, Hitchcock ascribed the impacting role of modern art to the derivatives – instead of the spatial significance – of Cubism. Blau and Troy also cite Colin Rowe and Robert Slutzky in this regard with their cryptic essays entitled "Transparency: Literal and Phenomenal" (1963, 1971). However insightful, their efforts were highly selective and largely a means to access the complex and ambiguous spatial readings of Le Corbusier's purist architecture. Rowe's and Slutzky's most noticeable impact is evidenced by the work of the New York Five – an aspect, according to Blau and Troy, that begs investigation.

Although all the mentioned authors acknowledged the facilitating role of Cubism on the semantic development of Heroic Modernism, none provided an in-depth review of this remarkable artistic movement, which, in this author's opinion, accounts for their relatively limited conclusions. By way of example, consider Banham's remark (1960a; 1996: 153) that "a direct influence of Cubism on architecture ... is hard to find, and attempts to compare buildings of the 'International Style' with Cubist paintings, particularly those done in 1909-12 in Paris, are never very convincing". Or the somewhat dismissive comment by Collins (1965; 1998: 278) that it "would be an exaggeration to assume that the original Cubism of Picasso had any direct and immediate influence on architecture ... Cubism, in fact was only of direct importance to architecture because it was developed by Le Corbusier into 'Purism'".

Amidst the ant-modernist debates of the 1960s and 1970s, theoretical discourse disengaged further from the impacting role of the artistic precedent as other design considerations intensified. In the preface to the 1967 edition of *Space, Time and Architecture* (xxxii) even Giedion acknowledged the "fatigue" that had infested the architectural arena:

> "In the sixties a certain confusion exists in contemporary architecture, as in painting; a kind of a pause, even a kind of exhaustion. Everyone is aware of it. Fatigue is normally accompanied by uncertainty, what to do and where to go. Fatigue is the mother of indecision, opening the door to escapism, to superficialities of all kinds ... many designers who had adopted the fashionable aspects of the 'International Style' now found that the fashion had worn thin ..."

However, in view of the prevailing neo-modern genre, it is not surprising to find a preoccupation with the aesthetic intentions of the pioneering Modernists – an enthusiasm that spawned, foremost, the ardent interest in the creative endeavours of the Soviet avant-garde of the 1920s. The mentioned anthology of essays edited by Blau and Troy, and initiated by the Canadian Centre for Architecture, is the most recently published account on Cubism and modern architecture. This work comprises a collection of critical appraisals that not only re-assert Giedion's presuppositions, but also contest those of Rowe and Slutzky.

Although cognizance is taken of these challenging points of view, this thesis attempts a discursive approach to the much-needed review of the artistic influences on Heroic Modernism. In contrast to Blau and Troy, Cubism *per se* is considered too narrow a definition to conduct such a study since it was its derivatives, as Hitchcock had rightfully observed, that spawned architectural equivalents – hence the generic qualification "modern art". With respect to Banham's canonical study, *Theory and Design in the First Machine Age* of 1960, less consideration is given to Futurism than to the tectonic implications of futurist sculpture and its impacting role on the architecture of the pioneering Soviet Modernists. Significantly, and indicative of the time of publication, Banham did not pursue the connection between Futurism (or Cubism, for that matter) and modern Soviet architecture – an aspect which this study attempts to address.

This thesis also differs from all the mentioned authors insofar as it adopts the depiction of pictorial depth as the paradigm for tracing the symbiotic relationship between the visual arts and architecture.

1.7 THEORETICAL STRATEGY

In order to conduct this interdisciplinary inquiry and contextualize the genesis of both modern art and modern architecture, this study commences with a brief reflection on the classic aesthetic. The chapter entitled "The Classical Ideal of Beauty" highlights the normative creative aspirations based on Pythagorean numerology and Platonic doctrine that dominated, intermittently, the aesthetic debate in the West for centuries. This chapter also serves as a preamble to the antithetical position adopted by modern artists and architects with regard to the stifling classic aesthetic ideal – albeit to a varying degree.

This is followed by a chronological account of the alternating cognitive perceptions of space that not only manifest in the manner in which pictorial depth is communicated, but also in the expression of plastic space. This particular chapter, "The Cogno-Perception of Space", establishes the framework for the self-conscious reversal to the aspectival mode of pictorial rendering and its far-reaching implications in the architectural arena.

The chapter entitled "The Mechanization of Vision" acknowledges the catalytic role of the Industrial Revolution on the appropriation of a contemporaneous design idiom, but advances the theory that the ultimate rejection of the classic aesthetic had resulted from the advent of photography. In support, this chapter reviews the changes in aesthetic perception that had resulted from the visual revolution in the fine arts arena, contextualizing also the genesis of Cubism.

In order to assess the seminal role of modern art on the codification of a modern architectural vocabulary, the chapter entitled "Cubism" discusses this artistic phenomenon in depth. Attention is given to the various influences on the realization of *Les Demoiselles d'Avignon*, the conclusions drawn from this seminal painting, the sequential development of Cubism, and its global assimilation.

The chapter entitled "The Pictorial Derivatives of Cubism" introduces those painterly initiatives that spawned architectural equivalents. In view of the fact that Purism was the only cubist derivative that did not progress through an interim volumetric stage before materializing in architectural format

attention is directed towards its genesis before pursuing the volumetric transformation of Cubo-Futurism, Suprematism and Neo-Plasticism in further chapters.

In view of the dearth of scholarly investigations into the impact of Le Corbusier's artistic production on his architecture, the chapters entitled "'After Cubism': Purism" and "The Correspondence between Purist Art and Purist Architecture" address this shortcoming. The first component reviews Purism in relation to the cubist precedent, examines purist aesthetic theory and provides a chronological account of Le Corbusier's purist paintings. The second component assesses thematically the correlation between purist art and purist architecture.

Both the chapters entitled "The Volumetric Transformation of Cubo-Futurism: The Soviet Avant-Garde" and "The Tectonic Incarnation of Astract Art: De Stijl" continue the investigation into the transmogrification of modern art via the cubist precedent. Specific attention is given to the then-pervading socio-political circumstances and the consequences of the functional design rationale on the aesthetic precepts derived from the visual arts.

This thesis is concluded with an assessment of the adopted presuppositions and a reflection on the longer-term objectives if this study.

1.8 DELINEATION AND CLARIFICATIONS

1.8.1 The architectural component of this study is restricted to Purism, De Stijl and the *œuvre* of the Soviet avant-garde – Constructivism in particular – as it is felt that these initiatives demonstrate best the symbiotic relationships between modern art and modern architecture. Certainly Maison Cubiste, the earliest architectural response to the visual revolution in the fine arts and designed by Raymond Duchamp-Villon (1876-1918) in 1912, is of historic significance. Despite David Cottington's recent attempt to draw attention to the socio-political factors that informed the project's realization in "The Maison Cubiste and the Meaning of Modernism in Pre-1914 France" (1997: 17-40), one has to side with both Banham (1960a; 1994: 203) and Yve-Alan Bois that Maison Cubiste did not convey remotely the spatial and plastic revelations of Cubism. To quote Bois from his essay entitled "Cubistic, Cubic and Cubist" (1997: 187):

> "I see nothing cubist, for example, but nothing at all, in Duchamp-Villon's celebrated Maison Cubiste. And although I have very limited knowledge of it, I would say the same of the so-called 'cubist' architecture of Prague."

Bois's views on the forty-odd buildings designed in a cubist mode by the proponents of the Czechoslovakian Group of Plastic Architects finds corroboration in Irena Z. Murray's remark in "The Burden of Cubism: The French Imprint on Czech Architecture, 1910-1914" (1997: 42) that "the thornier question of how Czech architecture related to the spatial explorations of cubism in French and Czech painting remains only partially formulated". Murray (*ibid.*) ascribes this to the fact that "many existing personal documents of such 'cubist' architects as Pavel Janak and Vlastislav Hoffman, in particular, have not been fully explored". Despite this conviction, scrutiny of the Czech's extraordinary body of work [13] reveals that it neither exceeded beyond a prismatic formal treatment, nor matched the anticipatory content of supportive writing on the spatial consequences of Cubism – hence their exclusion from this study. The same scenario pertains to the crystallized, glass architecture propogated by the so-called Utopian Correspondents of the German Expressionists, particularly by Taut. Although the origins of the fragmented and transparent qualities of their projects can in all probability be traced to Cubism, Expressionism also falls outside the scope of this investigation.

---

[13] Refer to the most extensive documentation in this regard by Von Vegesack, A. (ed.), 1992, *Czech Cubism; Architecture Furniture and Decorative Arts 1910-1925* (New York: Princeton Architectural Press).

1.8.2. The distinction between "Heroic (Orthodox) Modernism", the "Modern Movement", the "International Style" and "modern architecture" is deliberate.

i) "Heroic Modernism" is designated to the body of work produced, predominantly in Europe, between 1917 and 1933. The denotation is derived from the book *The Heroic Period of Modern Architecture* (1981) by Alison and Peter Smithson, of which the first extracts were published in the British journal *Architectural Design* in December 1965. These authors consider the work by individuals such as Peter Behrens (1868-1940), Loos and Wright – although catalytic – as a prelude to the actual heroic phase. They maintain that this particular period commenced with the inception of De Stijl in 1917 and concluded with the completion of the cinema De Handelsblad-Cineac, Amsterdam, by Johannes Duiker (1890-1935) in 1934. Their selection of projects demonstrating this so-called heroic phenomenon warranted the following comment that "we are looking for is a building which is so different from those which preceded it as to establish a new architecture as fact, not as a possibility" (1981: 9). However, the year "1933" is considered a more appropriate culminating date since it coincided with the official closure of the Bauhaus – one year after Stalin had outlawed all forms of modernist expression in the Soviet Union.

ii) The "Modern Movement" encompasses the pioneering, though divergent, schools of thought that were all ardently committed to give architectural expression to the so-called Machine Age. Such a distinction excludes Art Nouveau and its various derivatives, and includes the following: the Deutsche Werkbund and Bauhaus-affiliate, Futurism, Expressionism, Purism, Volumetric Suprematism, Soviet Rationalism, Constructivism, the Neue Sachlichkeit, De Stijl and Czech Cubism. In most of these instances, their design intentions and ideological dispositions were either communicated in manifesto format, or via some literary review. With the notable exception of the work and theories of Wright, the majority of other architectural initiatives that materialized elsewhere during this particular period can be considered part of the globalization of the Modern Movement. Although often original in the manner of interpretation or application, these design enterprises were based on canons that had already been established – as was the case with Italian Rationalism, the French L'Effort Moderne, the Hungarian MA Group, the Belgian Sept Arts, the German G Group and the South African Zero Hour initiative.

iii) The term "International Style" refers to the so-called cubist mode of architecture that demonstrated a coherent range of characteristics as described by Hitchock and Johnson in *The International Style: Architecture Since 1922*, published in 1932.

iv) "Modern architecture" is a generic, though ambiguous, denotation that applies to architectural manifestations not derived from any historical precedent. Strictly speaking, its inception can be extended to Art Nouveau in 1872 and concluded with the dissolution of the CIAM in 1959. Inevitably, it includes the expansive range of design alternatives that emerged after the heroic period of Modernism. Although numerous buildings excecuted after 1959 can still be considered conclusively 'modern', they need to be reviewed in relation to the 1960s when radical conceptual premises were developed to counter the earlier initiatives that responded, explicitly, to the industrial paradigm.

1.8.3 The same difficulties that pertain to the delineation of modern architecture apply to the generic reference "modern art". The inception of modern art is generally accredited to the painting *Le Déjeuner sur l'Herbe* of 1863 by Édouard Manet (1832-1883). However, the consecration of modern art is ascribed to the reversal to the aspectival mode of visual communication as demonstrated by Pablo Picasso (1881-1973) in *Les Desmoiselles d'Avignon* of 1907.

1.8.4 The following artistic terms require clarification:

i) The term "visual art" refers to all artistic expression experienced through sight. Although architecture is sometimes included, the denotation, for the purposes of this thesis, refers only to fine arts and sculpture.

ii) The term "fine art" gained currency during the early 19th century to distinguish between non-utilitarian, aesthetic pursuits and other art forms associated with the manufacture or decoration of utilitarian artefacts. According to Frayling and Van der Meer (1992: "Key Definitions", 19.): "Today, its most cryptic definition comes in, of all places, American customs and excise documents; a work of art should be completely 'useless' to count as fine art." Fine art qualifies as so-called art for art's sake – derived from the French phrase *l'art pour l'art*, coined in 1880 by Victor Cousin – implying that it exists purely for its own benefit. For the purposes of this thesis, the term will be used with reference to the pictorial arts – drawing, painting, lithography, and so forth – in order to distinguish these from sculpture.

iii) The term "plastic art" refers to those art forms that require moulding or modelling, but is often used to distinguish the visual arts from literary and musical pursuits. Adherents of De Stijl and Le Corbusier frequently used the term to draw attention to the similarities between the visual arts and architecture. For the purposes of this thesis, the term refers specifically to sculpture and architecture.

1.8.5 The nature of the investigations into the three selected aesthetic initiatives – Purism, Constructivism and De Stijl – depended on the circumstances surrounding each particular movement, coupled with the ease with which the connection between art and architecture could be made. Due to the complexity of Purism and the dearth of information on Le Corbusier's painterly career, his *oeuvre* is examined most extensively.

1.9 EDITORIAL CONVENTIONS

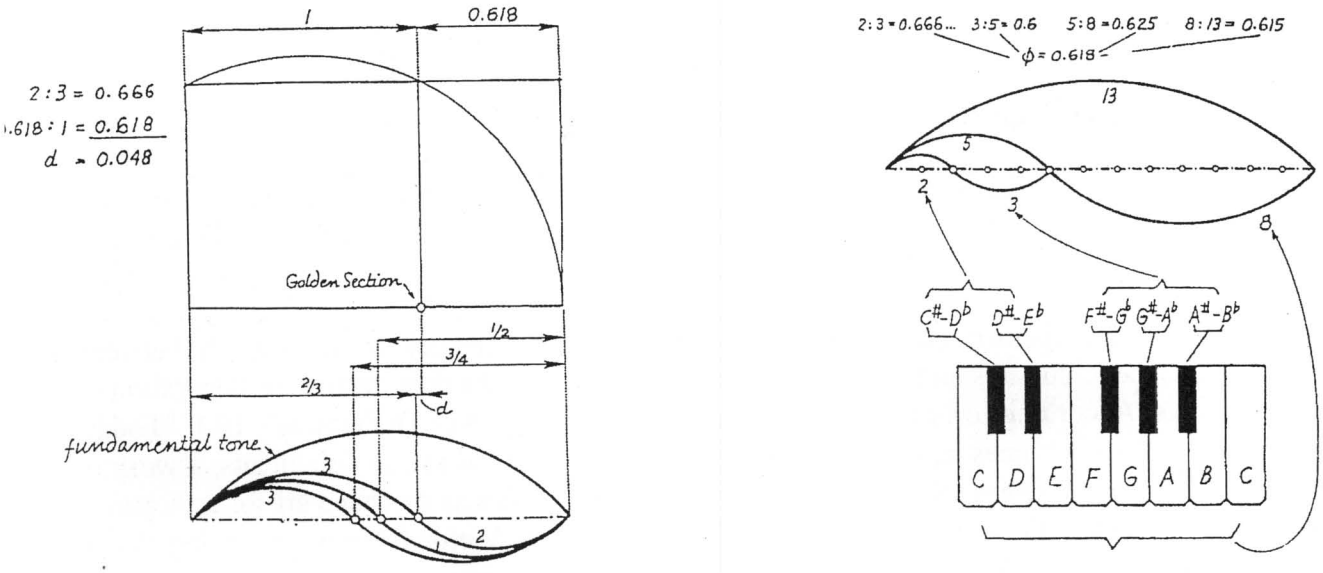
1.9.1 Le Corbusier will be consistently be referred to by his pseudonym in order to distinguish his efforts from those of his cousin and partner, Pierre Jeanneret.

1.9.2 The capitalization of denotations haunts any study of this nature. Moreover, according to current editorial conventions – and notable exceptions (i.e., Modern Movement, Gothic Revival) – capitalization does not apply in qualifying instances (i.e., Modernism vs modern architecure, Cubism vs cubist painting). However, for the sake of consistency, the titles of movements in art and architecture, ideological dispositions, books, paintings and buildings are capitalized throughout the thesis – including foreign titles. Any deviation reflects the preference of a particular author. All other conventions comply with the 8th edition of the *Oxford English Dictionary* (1996).

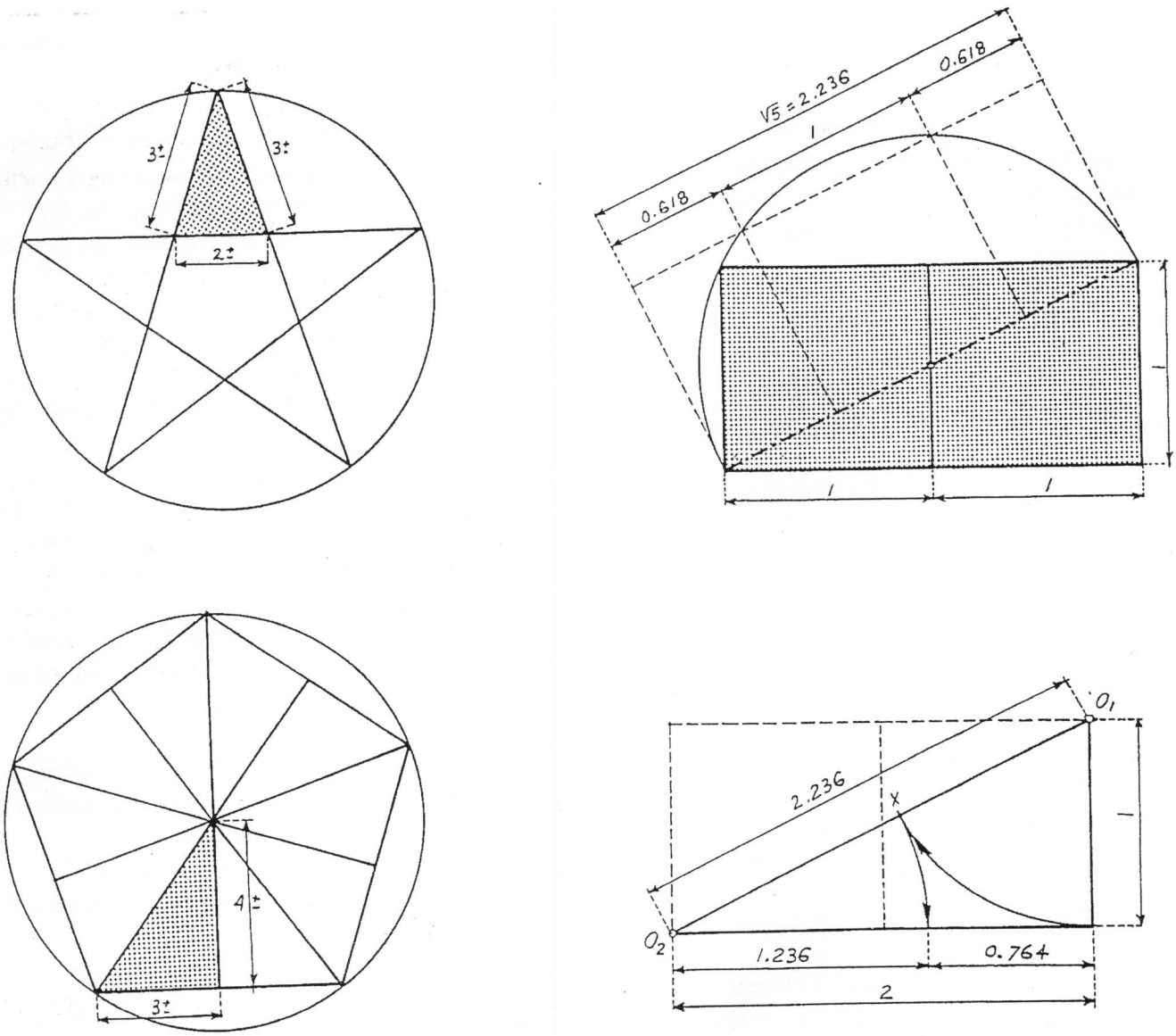
1.9.3 The dating of the respective architectural movement comply with Frampton, K., 1980, *Modern Architecture: A Critical History* (London: Thames & Hudson). The dating of art movements concurs with Stangos, N. (ed.), 1991 ed., *Concepts of Modern Art* (London: Thames & Hudson).

1.9.4 Discrepancies in the spelling of names and surnames were encountered, particularly with regard to Eastern Europeans. These have been anglicized.

1.9.5 In addition to Notes and References, refer to the Glossary for further clarification of concepts or terms not referred to elsewhere in the text.



2.1 Algebraic ratios derived from musical instruments: vibrating violin and piano keyboard.



2.2 Geometrical equivalents of musical harmonies and corresponding Golden Section proportions.

CHAPTER 2 THE CLASSICAL IDEAL OF BEAUTY

2.1 PREFACE

The quest for codifying an industrially responsive architectural vocabulary coincided with the dismissal of past design premises. The anti-historicist position adopted by the pioneering modern architects violated, in particular, the classical canons of beauty.

For the purpose of contextualizing the genesis of the modern aesthetic, a reflection on the classical perception of beauty is considered imperative. The principal objective of this chapter is to define the classical aesthetic in order to emphasize the paradoxical extent to which Modernism materialized as its antithesis.

The first part of this chapter qualifies the classical ideal of beauty, followed by a description of the classical design methodology and its reinstatement during the Renaissance. Classicism, in relation to this thesis, pertains to the art and architecture of Graeco-Roman origin that corresponded to the theoretical postulates of the ancient Greek philosophers.

2.2 INTRODUCTION

The bipolar dualities that characterize our earthly existence and the complementary opposites that verify the validity of both the self and the other, must have been recognized since the dawn of Man. This recognition not only precipitated the moral and ethical dilemmas posed by life versus death and good versus evil, but also aesthetic appreciation.

The value judgement inherent in the identification of beauty (versus ugliness) must have stimulated Man's passionate yearning for its attainment – with beauty qualified as the emotional sensation from which human senses derive pleasure. Man's predisposition to the intentional manipulation of sensory stimuli can be traced to the earliest manifestations of civilization and extends to all the diverse forms of creative expression, including the design of buildings.

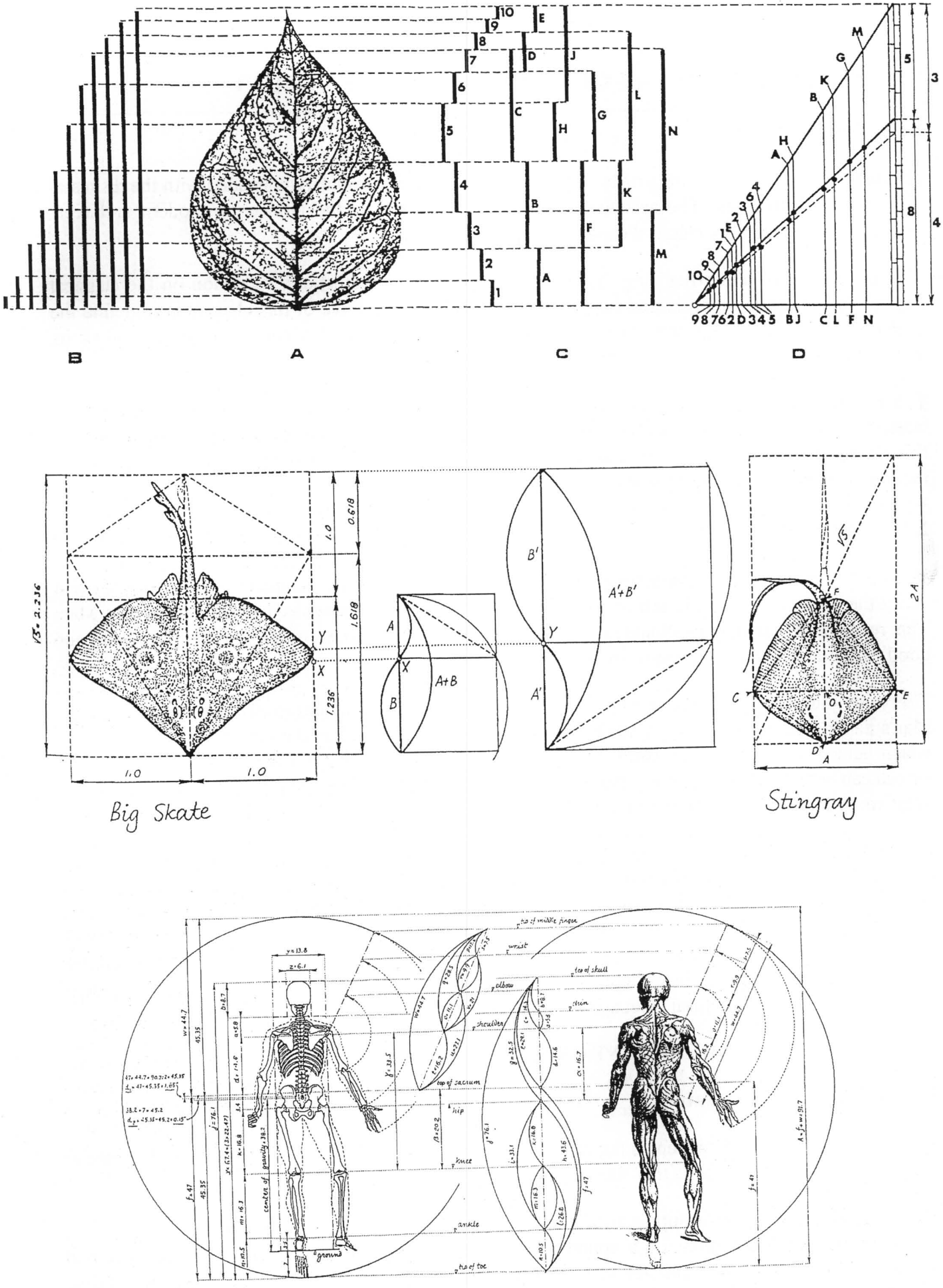
Ever since the extension of architectural decision-making beyond pragmatic dictates, designers have been wrestling with the formulation of a fundamental set of principles that would govern aesthetic consideration. Our indebtedness to the ancient Greek philosophers stems from the impetus they provided for the formulation of an aesthetic criterion and corresponding design methodology that served as the dominant, Western, premise for architecture until the latter half of the 19th century. Bruno Zevi (1957: 20) is of the opinion that "Without a language we cannot speak, yet in the course of centuries only one architectural language had been codified, that of classical architecture".

2.3 THE LEGACY OF ANCIENT GREECE

2.3.1 The Decoding of Nature

Beauty as a philosophical concept is not only concerned with what it is, but also with how to create or recreate it, and with the criteria that should be applied in determining its authenticity.

The classical perception of beauty is attributed to the discovery by Pythagoras (c. 571-496 B.C.) of the correlation between the pitch of a sound and the physical divisions of the strings of a musical instrument, which could be translated into numerical terms (*fig. 2.1*). The recognition that an amicable agreement of sound (harmony) is produced by certain mathematical relationships (versus the dissonance, or discord, that results from others) led to the aesthetic axiom that sensory satisfaction can be ascribed to specific algebraic ratios (*fig. 2.2*).



2.3 Proportions derived from a leaf, fish and human body approximating the Golden Section.

According to Rudolf Wittkower (1963; 1975: 85):

> "This discovery of the close interrelationship of sound, space, and numbers had immense consequences, for it seemed to hold the key to the unexplored regions of universal harmony. Moreover, if the invariable of all octaves is the ratio 1:2, it must be this ratio, the Greeks argued, that is the cause of the musical consonance. Perfection and beauty were therefore ascribed to the ratio itself."

The ensuing studies conducted by Pythagoras and his ardent followers led to another discovery, namely, the mathematical structure exemplified by the harmonious musical scale is identical with the constitution of all natural phenomena, including the human body (*fig. 2.3*). [1] As Wittkower (*ibid.*) remarks:

> "It must be regarded as one of the most extraordinary events in the early history of mankind when a bridge was created between abstract mathematical thought and the phenomenal world that surrounds us; when geometry and numbers were found to govern the skies as well as all creation on earth."

Following from the Pythagorean predication that numerical values underlie the organizational structure of the universe, which could moreover be geometrically transcribed, it was evidently concluded that man-made artefacts of a similar construction would constitute 'perfection' – reinforced by the certitudes provided by mathematics. The respective ratios approximating the numerical value of *phi* – demonstrated by the algebraic formula of what in time became known as the Golden Section – were believed to embody these supposedly divine properties. [2] Hence the adoption of the Golden Section as the favoured means to determine the relationship of the different components to one another, and to the whole. Consequently, proportion was established as the foundation of a classical design methodology and considered a prerequisite for attaining man-made beauty.

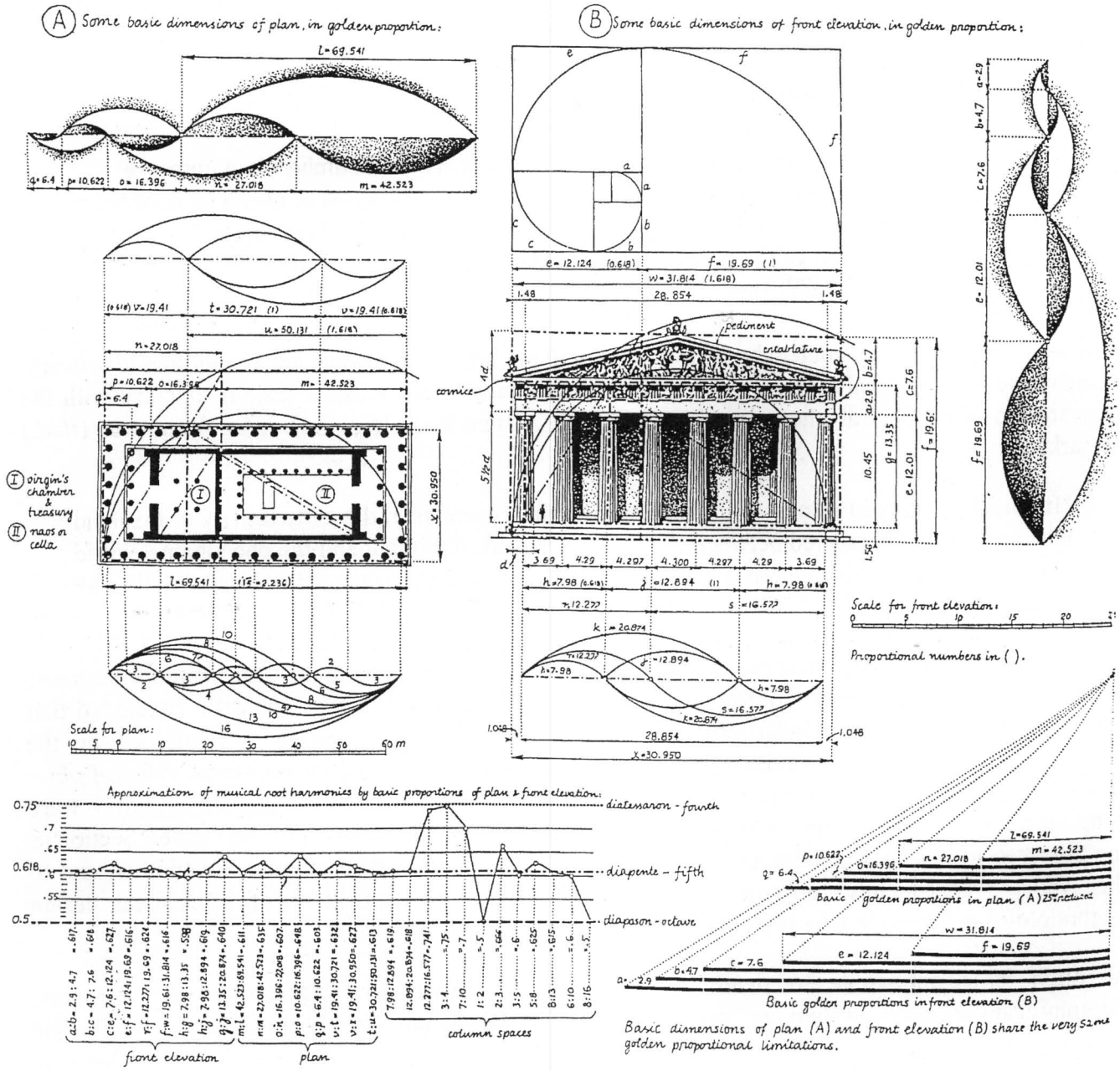
Although it is impossible to determine when Greek edifices first adhered to an *a priori*, metaphysically-inspired system of proportion, [3] the Parthenon (c. 447-432 B.C.) is a vivid

---

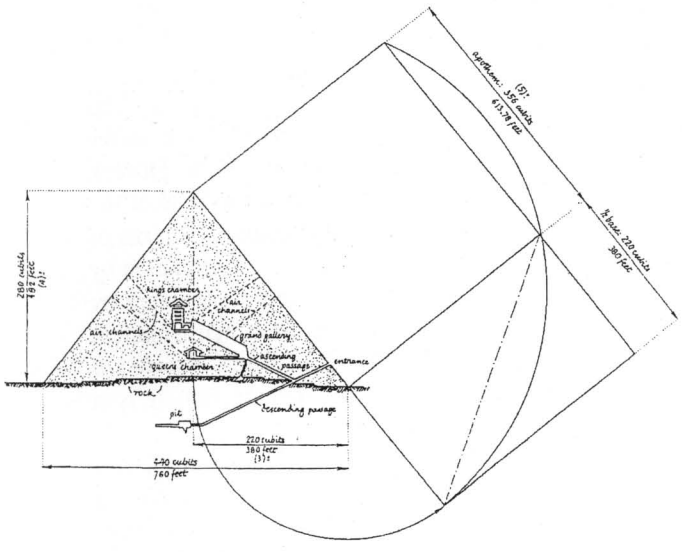
1 See Doczi, G., 1981, *Power of Limits – Proportional Harmonies in Nature, Art and Architecture* (Boulder, Colo.: Shambhala), for a comprehensive, recent account of the corresponding systems of proportions exemplified in both natural and man-made phenomena. Refer specifically to his explanation (*ibid.*: 8-11) of how the ratios of the different musical chords approximate that of the Golden Section. See also Wittkower, R., 1962, *Architectural Principle and the Age of Humanism* (London: Alec Tiranti), and Alberti, L. B., *The Ten Books of Architecture*, 1755 Leoni ed.; Ten Books of Architecture (New York: Dover).

2 The Golden Section only became known as such during the 19th century. It was previously referred to as "The Section" by Plato and arithmically formulated by Greek mathematician Euclid (c. 300 B.C.) in *Elements of Geometry* (n.d.). Even though Vitruvius, 1914 ed.; 1960, *The Ten Books on Architecture*, trans. Morgan, M. (New York: Dover), did not provide any arithmetic account of its formula, his stipulated dimensions consistently approximated those of the Golden Section, as indicated by Doczi (1981: 106-112). The fact that the musical scale, human dimensions, patterns of organic growth and cosmic phenomena all correspond to exactly the same ratios, explains why it could be assimilated by so many different civilizations, regardless of the actual point of departure. Analyses of Ndebele art and architecture by Peter Rich of the Univ. of the Witwatersrand also indicate an unselfconscious approximation of these mathematical properties. Even recently conducted opinion polls on human beauty, published in June 1996 in *Time*, showed a preference for features that correspond proportionally to the Golden Section, leading one to conclude that it is a universal, intuitive, aesthetic sensibility.

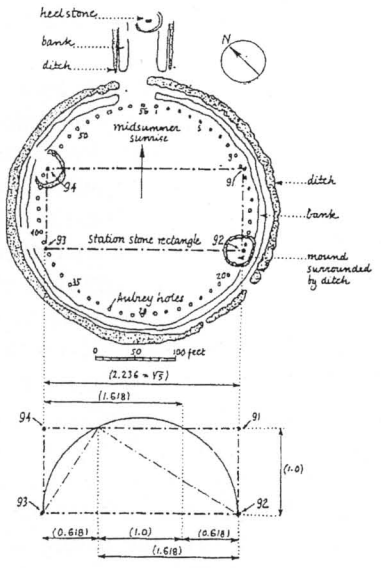
3 Vitruvius (1914 ed.; 1960: 198) mentions a book written by one Silenus on the proportions of Doric structures, and another on the proportions of the Doric Temple of Juno [Hera] (c. 600-575 B.C.) at Samos by an author named Theodorus. Vitruvius also refers to a treatise on the Parthenon by its architect, Iktinos [Ictinus] (c. 500-400 B.C.). If these 'publications' coincided with the dating of these mentioned buildings (and were not written retrospectively), then sanctioned systems of proportion were applied some hundred years before the design of the Parthenon. The proportions of the earlier temples were based, presumably, on anthropometrics – rather than on the algebraic deductions made by Pythagoras from the musical scale.



2.4 Golden Section proportions pertaining to the Parthenon, Athens (c. 447-432 B.C.).



2.5 Golden Section proportions pertaining to the Great Pyramid of Cheops, Giza (c. 2550 B.C.).



2.6 Golden Section proportions pertaining to Stonehenge, Wiltshire (c. 2000-1 600 B.C.)

demonstration of the response to a collective, Pythagorean consciousness (*fig. 2.4*). However, according to Roman architect and scholar Marcus Vitruvius Pollio (c. 90-20 B.C.) the dimensions of the Doric Order and first Greek temples had long before, and rather unselfconsciously, evolved from the measurements of the human body (1914 ed.; 1960: 103). The later, quasi-scientific analyses of nature must have served as a confirmation, a refinement and ultimate rationalization of an empirically determined *modus operandi*. It would, however, be erroneous to assume that these algebraic relationships were known only to, and applied by, the ancient Greeks. The Egyptian pyramids (c. 2680 B.C., *fig. 2.5*), the Babylonian ziggurats (c. 2200 B.C.) and even the structures at Stonehenge (c. 2000-1600 B.C., *fig. 2.6*) conform to identical numerical conventions, although derived from astronomical data that pre-date the Parthenon by more than a thousand years (Doczi, 1981: 40-41).

2.3.2 Platonic Aesthetic Doctrine

Plato (427-347 B.C.), familiar with Pythagorean numerology and, presumably, the splendours of the Parthenon, expanded upon the available 'scientific' data and prevailing philosophical premises when he formulated his all-encompassing doctrine – the "Theory of Ideas" (or "Forms"). [4] His distinction between the sensory versus the non-sensory world – of which the latter could only be accessed in spirit or via the intellect – also formed the basis of his influential aesthetic dogma and supposedly objective criterion of beauty. On the one hand, the existence of these dual realities provided the explanation for all human aspiration and, on the other hand, established the norm for these aspirations.

According to Plato, all perceptible phenomena are merely copies (imitations) of the primordial "Idea". Consequently, beauty is not recognizable from a dualistic position with regard to the 'non-beautiful', but exists instead as a memory (a reminiscence) of the "Normative"; of the "Absolute". This postulate is presented in Socratic dialogue from the *Phaedo* [*Phaedrus*] (1966 ed.: 158-159) as follows:

> "I am assuming the existence of absolute Beauty and Goodness and Magnitude and the rest of all of them ... It seems to me that whatever else is beautiful apart from absolute Beauty is beautiful because it partakes of that absolute beautiful, and for no other reason ... If someone tells me that the reason why a given object is beautiful is that it has a gorgeous colour or shape or any such attribute, I disregard all these other explanations – I find them confusing – and I cling simply and straightforwardly and no doubt foolishly to the explanation that the one thing that makes that object beautiful is the presence in it or association with it (in whatever way the relation comes about) of absolute Beauty ... it is by Beauty that beautiful things are beautiful."

Although Plato argued that artistic expression will always remain mimetic because it is modelled on an imitative cognition, the artist should nonetheless aspire to express the absolute – the ideal – and, consequently, never the particular. 'True' art is indeed possible according to this normative aspiration, but calls for the highest technical skill and artistic excellence. Plato was adamant that all artists were morally obliged to aspire to this aesthetic goal. He even propagated in *Politeia* and *Nomoi* a stringent form of artistic censorship to ensure that this would be accomplished.

Plato never mentioned architecture as such, but he did address the existence of universal cosmic laws and propagated their application. According to theologian Pieter Dreyer (1974: 94):

---

4 Since Plato's theory was not presented systematically in any of his writings, he used both terms intermittently, which gave rise to varied interpretations. Moreover, the Greek words *eidos* (form) and *idea* (idea) relate to the verb *idein* which is literally translated as "to see". This has led some scholars to substitute it with the word "shape". Dreyer, P., 1974 ed., *Die Wysbegeerte van die Grieke* (Pretoria: Van Schaik), 92, uses the term *aanskoulike vorm*, although neither the "Form", nor the "Idea", can ever be visible – only its mental conception is possible. On the other hand, since Plato had identified specific stereometric forms of particular practical implication, the capitalized version "Form" represents the normative aspiration – hence its equation with the capitalized "Idea".

> "In the *Timaios* [*Timaeus*], one of Plato's late works, another concept comes to the fore: the ideas are the models or patterns according to which the universe had been constructed by its creator. This concept is presented in isolation in Plato's philosophy, but exerted considerable influence on early Christen thinkers." [Translation by author.]

This statement is particularly significant in that it provides a disciplinary interpretation that does not follow the same pattern of thought as when assessed from an architectural point of view, which, by contrast, contextualizes the derivation and practical implications of these universal laws. According to Plato, mathematics were the principal means by which the link between the sensible and the intelligible could be established. He even identified specific forms – in time known as the Platonic Solids [5] – that encapsulated eternal beauty as their constitution corresponded to the numerical laws of the universe. This is paraphrased by Diané Collinson (1988: 20, 24) as follows:

> "The belief in a world of perfect or ideal Forms grew from the recognition of the ever-changing and imperfect nature of sensible objects and the realisation that it is possible to formulate perfect conceptions of at least some things, and particularly of geometrical figures such as circles, triangles and so on. Such considerations led Plato to posit the existence of a realm of perfect Forms, non-corporeal, eternal and wholly real, of which the world of material objects apprised by the senses was an imitation."
> "Mathematical knowledge is the paradigm here: a perfect triangle or perfect circle may be known to the intellect as a concept or definition but cannot be an object for the senses."

It was Plato's sanctioning of specific stereometric forms that ensured their seminal role in the history of architecture. According to Wittkower (1963; 1975: 85-86):

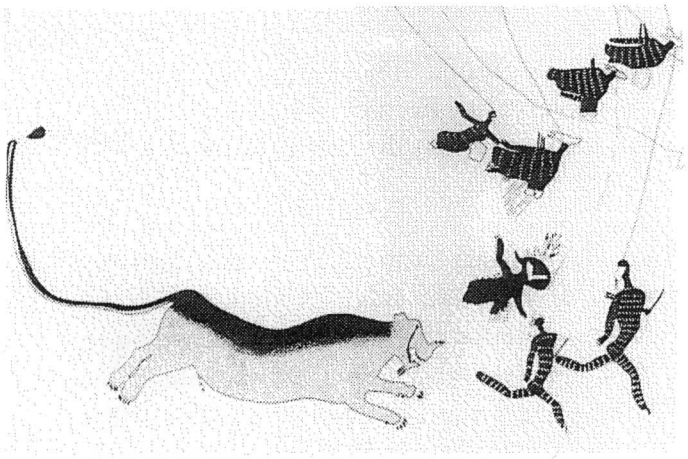
> "Plato, in his *Timaeus*, expounded a geometrical theory which is no less influential [than the Pythagorean view that ascribed beauty and perfection to the ratio]. He postulated that certain simple figures of plane geometry were the basic stuff of which the universe was composed. I have no doubt that it was mainly owing to Plato's never-forgotten cosmological theory that such figures as the equilateral triangle, the right-angled isosceles triangle, and the square were charged with a deep significance and played such an important part in the Western approach to proportion."

It could be argued that architecture, because of its intrinsic dependence on geometry, constitutes the aspired Ideal and Objective more readily than the visual arts.

Although Plato's intellectual premises were severely contested by his student, Aristotle (384-322 B.C.) – particularly his negligence of the sensory which Aristotle promptly reinstated as the basis of reality – the significance of Plato's aesthetic doctrines cannot be over-emphasized. In addition to the formulation of a preordained aesthetic criterion and prescribed creative aspirations, the archetypal (the primordial) was also to assume a prominent theoretical position from the Enlightenment onwards. Plato's creative 'humility' was, however, surpassed – as already alluded to by Vitruvius but confirmed during the Renaissance – by an incontestability of both the perception and evaluation of man-made beauty. Consequently, and according to the classical perception of beauty, both artistic and architectural excellence would be attained by the 'correct' application of preordained aesthetic canons.

---

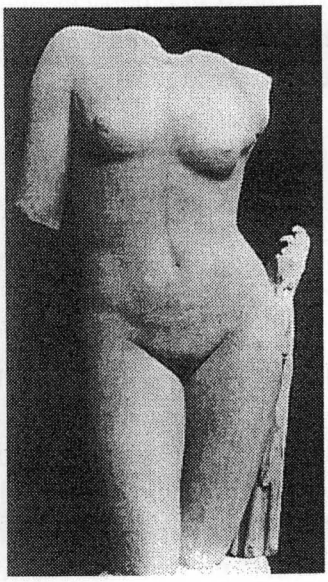
5 Significantly, the Platonic Solids identified by Plato in *Timaeus* [*Timaios*] are that series of polyhedra of which all vertices are located in the surface of a sphere and all the planes and edges are equal. These include the tetrahedron, consisting of four equilateral triangles; the hexahedron (or cube) consisting of six squares; the octahedron, consisting of eight pentagons; the dodecahedron, consisting of twelve equilateral triangles; and the icosahedron, consisting of twenty equilateral triangles. The identification of the cuboid, cone, pyramid, sphere and cylinder as the Platonic Solids is erroneous. Instead, they qualify as Tectonic Solids, based on primary Euclidean geometry.



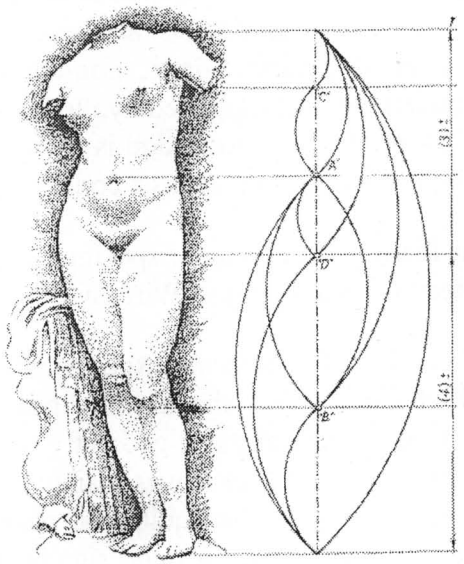
2.7 **African rock art:** Untitled, Kalahari (c. 5000 B.C.).



2.8 Egyptial mural art: Anon., *Fowling Scene*, Tomb of Nebanum, Thebes (c. 1400 B.C.).



2.9 Roman copy of original Greek statue: Anon., *Aphrodite of Cerene* (c. 300-400 B.C.).



2.10 *Aphrodite of Cyrene*, indicating the applied system of proportion.



2.11 **Greek mural art:** Anon., *The Rape of Persephone*, Tomb at Vergina (c. 340 B.C.).



2.12 Roman mural art: Anon., *Young Girl Gathering Flowers*, Pompeii (c. 15 B.C.-A.D. 60).

2.3.3 Classical Artistic Aspiration

Since the beginning of time, human beings considered it imperative to give visual expression to their thoughts and experiences (*figs 2.7-2.8*). It is no coincidence that the transition from archaic representational conventions to naturalism occurred in ancient Greece. According to archeologist and art historian Martin Robertson (1965: 168):

> "The changes can, in a sense, be fixed to a precise point in time: the first few decades of the fifth century B.C., which saw the deliberate sloughing of certain ancient conventions in representation, and the triumph of the new, Greek, vision – the moment we designate as the change from archaic to classical."

Although Plato's aesthetic premises exercized considerable influence on normative artistic aspiration, the revolutionary change from the aspectival [6] to the perspectival mode of visual communication had already occurred some fifty years before his birth. Robertson (*ibid.*: 190) maintains that "We do not know by whom or where the change was first achieved, but statues on the new model [of representation] were being made in Athens before 480 B.C." Notwithstanding, this significant artistic metamorphosis can with great certainty be ascribed to the persuasive intellectual climate that permeated all forms of Greek endeauvour. In the words of Robertson (*ibid.*: 209):

> "This intellectualization of the creative urge, the feeling that it should be possible to find rules for beauty and in particular to express it in mathematical terms, [was] of fundamental importance in [the development of] Greek art."

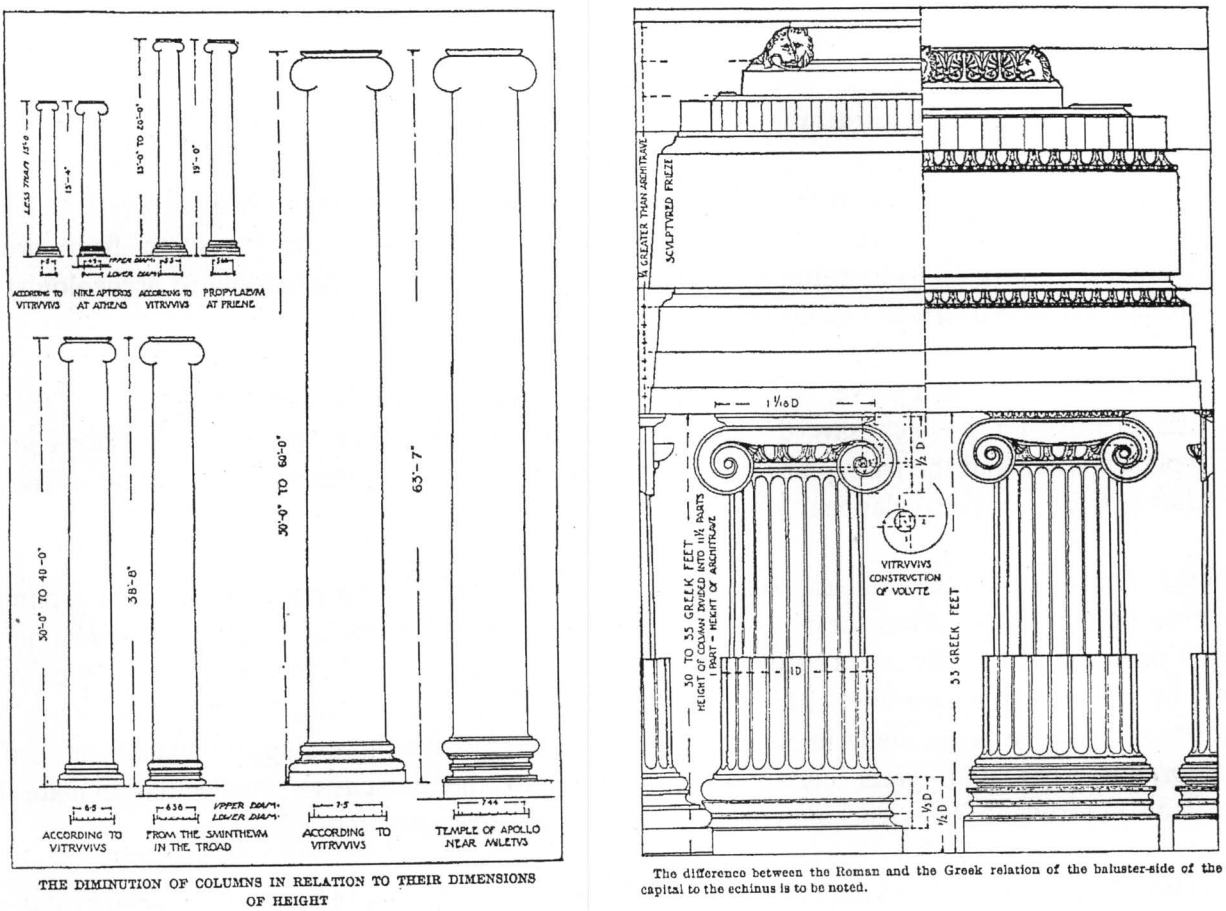
Understandably, the first aesthetic changes manifested in free-standing sculpture – a medium conducive to mimetic representation (*figs 2.9-2.10*). The means with which to convey depth on a flat, two-dimensional surface materialized more gradually and were – according to literary descriptions instead of surviving artefactual evidence – only mastered by the second half of the 4th century B.C. (*figs 2.11-2.12*). Vitruvius (1914 ed.; 1960: 198), however, refers to a theory of perspective, formulated by the physicists-*cum*-philosophers Democritus (c. 460-370 B.C.) and Anaxagoras (c. 500-428 B.C.) that must have been in circulation long before that time:

> "In the first place Agatharcus, in Athens, when Aeschylus was bringing out a tragedy, painted a scene, and left a commentary about it. This led Democritus and Anaxagoras to write on the same subject, showing how, given a centre in a definite place, the lines should naturally correspond with due regard to the point of sight and the divergence of the visual rays, so that by this deception a faithful representation of the appearance of buildings might be given in painted scenery, and so that, though all is drawn on a vertical flat façade, some parts may seem to be withdrawing into the background, and others to be standing out in front."

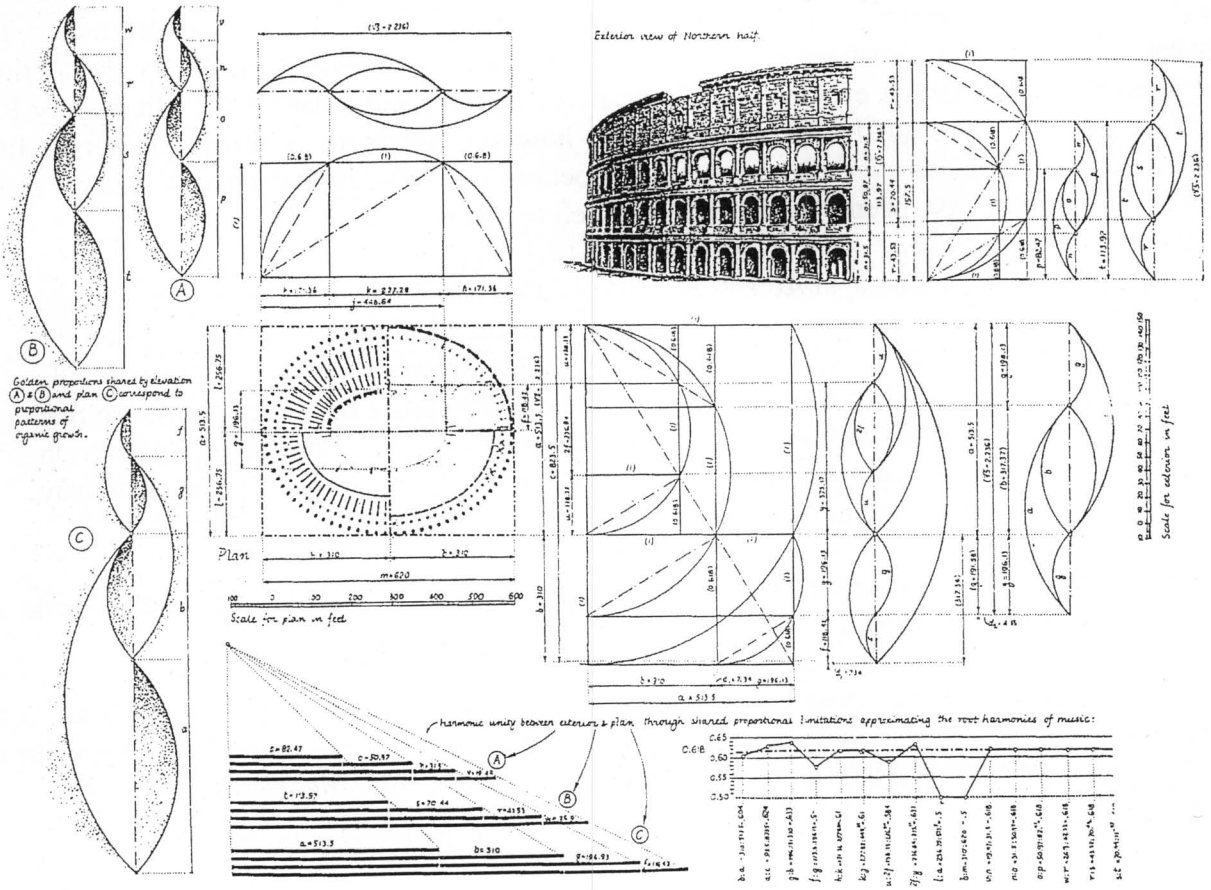
Although it is possible that descriptions of this kind influenced the optical adjustments made in architecture, it remains speculative.

---

6 According to Bührman, H., 1982, "Origins and Development of Architectural Perception", unpublished M. Arch. dissertation, Univ. of the Orange Free State: 4, the term "aspective" was coined by editor Brunner-Taut in response to the German word *Geradvorstellung* – encountered when translating Schäfer, H., 1974, *Principles of Egyptian Art.*



2.13 The proportions pertaining to the Greek Orders as expounded by Vitruvius.



2.14 Golden Section proportions pertaining to the Colosseum, Rome (A.D. to 70-82).

The ancient Greek artists and architects wrote extensively about their pursuits, but few of these writings have survived. The mere fact that they committed themselves to paper is telling since it indicates that they felt compelled to share their newly acquired knowledge and insights. Robertson (1962: 209) mentions Polyclitus of Argos – a contemporary of the renowned sculptor, Phi[e]dias (c. 490-415 B.C.) – who wrote one of the first books on the application of proportion, entitled *Canon*, though pertaining to sculpture. According to Vitruvius (1914 ed.; 1960: 198), Iktinos [Ictinus] (c. 500-400 B.C.), the architect of the Parthenon, wrote a treatise on the application of proportion in architecture that would have shed light on the reasons for his deviation from past design conventions if it was still available. Mention is also made of academic institutions, particularly the School of Sicyon, whose design curriculum was based on 'scientific' studies that included arithmetics, geometry and, presumably, optics (Robertson, 1965: 227-228).

Classical Greek art was unique in that it, firstly, developed new artistic conventions and, secondly, aspired explicitly to express the ideal instead of the particular. With rare exceptions, post-Platonic Greek artists shared this tendency for the idealization of beauty. A portraitist, Demetrius of Alopece (c. 400-300 B.C.), is said to have been chastised for being "fonder of likeness than of beauty" (*ibid.*: 225). However, Plato's aesthetic doctrines exerted considerably less influence on the pictorial arts of the Roman Empire, judging from Vitruvius' slating criticism of its 'decadence':

> "A picture is, in fact, a representation of a thing that really exists ... But those subjects which were copied from actual realities are scorned in these days of bad taste. We now have fresco paintings of monstrosities [half-length figures, some with human heads, others with heads of animals], rather than truthful representations of definite things ..., it is the new taste that has caused bad judges of poor art to prevail over true excellence ... The fact is that the artistic excellence which the ancients endeavoured to attain by working hard and taking pains, is now attempted by the use of colours and the brave show which they make, and expenditure by the employer prevents people from missing the artistic refinements that once lent authority to the works." (1914 ed.; 1960: 210-211)

2.3.4 The Vitruvian Confirmation

Vitruvius' renowned treatise on architecture *The Ten Books on Architecture* (46 B.C.) serves as the only original account of the prescribed aesthetic canons of the Graeco-Roman design methodology. His incessant references to Greek philosophy, physics, music and astrology are testimony to their 'disciplinary' influence on the formulation of a metaphysical aesthetic theory, derived from natural and cosmic premises:

> "... our ancestors ... took their models from Nature, and by imitating them were led by divine facts, until they perfected the contrivances which are so serviceable in our life". [27] "For in all their works they proceeded on definite principles of fitness and in ways derived from the truth of Nature. Hence, from the sources which have been described they established and left us the rules of symmetry and proportion ..." (*ibid.*: 109)

In *The Ten Books on Architecture*, Vitruvius identifies the fundamental principles of architecture as order, arrangement, eurythmy, symmetry, propriety and economy, appropriated with due reference to durability, convenience and beauty. According to Vitruvius (*ibid.*: 174) man-made beauty was attainable only through the 'correct' application of symmetry and proportion:

> "There is nothing that an architect should devote more thought to than to the exact proportions of his building with reference to a certain part selected as standard." (*fig. 2.13*)

Whilst providing a comprehensive account of sound building practice, his extensive descriptions of supposedly acceptable design procedures prioritized classical design decision-making:

> "After the standard of symmetry has been determined, and the proportionate dimensions adjusted by calculations, it is the next part of wisdom to consider the nature of the site ... and modify the plan by diminution or additions in such a manner [that] these (adjustments) ... be made on correct principles, and without distracting at all from the effect." (1914 ed.; 1960: 174)

Deviation from these prescribed procedures were permitted only when it would enhance the overall effect, but was encouraged when it would reinforce visual observation:

> "... we must counteract the ocular deception by an adjustment of proportions ... For the eye is always in search of beauty, and if we do not gratify its desire for pleasure by proportionate enlargement in these measures, and thus make compensation for ocular deception, a clumsy and awkward appearance will be presented to the beholder." (*ibid.*: 84)

In accordance with Vitruvian dictates, harmony will prevail when buildings are symmetrically composed, coupled with careful consideration of proportion:

> "Since nature has designed the human body so that its members are duly proportioned to the frame as a whole, it appears that the ancients [*sic*] had good reason for their rule, that in perfect buildings the different members must be in exact symmetrical relations to the whole general scheme." (*ibid.*: 73)

Therefore, classical architecture materialized through the calculated manipulation of preordained design principles (*fig. 2.14*). The deliberated compositional ensemble emulated the visual tranquillity prevailing in nature, reinforced by the certitudes of mathematics, geometry and optics. In the final analysis, the classical ideal of man-made beauty was embodied in the aspiration to recreate cosmic equilibrium and in so doing to attain 'divine' perfection. In the words of Vitruvius (*ibid.*: 109):

> "Thus they [the ancient Greeks] reached perfection, approving only those things which, if challenged, can be explained on grounds of the truth."

2.3.5 Nature as Design Precedent

In hindsight, it is not difficult to appreciate the ancient Greeks' fascination with nature as no other design precedent existed for creating a man-made environment. However, the Greek model differs substantially from later interpretations. The former was a concerted effort at deciphering the 'design formula' of nature and other cosmic phenomena. Accordingly, the laws of nature – and not the natural object – were adopted as the conceptual point of departure, verifying all decision-making on design. This gave rise to a process of conceptualization that Geoffrey Broadbent [7] terms "canonic" and whereby the building format materializes as a result of the rigorous application of preordained aesthetic canons and mathematical rules.

---

7 See Broadbent, G., 1988, *Design in Architecture: Architecture and the Human Sciences* (London: Fuller), for his account of the four different modes of design conceptualization which he qualified as pragmatic, analogous, iconic and canonic. Inevitably, the canonic design method of the ancient Greeks was preceded by the analogous which, in turn, evolved from the pragmatic. Broadbent subsequently reviewed these distinctions, published in Glusberg, J. (ed.), 1991, *Deconstruction – A Student Guide, UIA Journal of Architectural Theory and Criticism* (London: Academy Editions), 81. The iconic design method was replaced by the typologic, and the canonic by the syntactic.

By contrast, modern design manifestations, such as Art Nouveau and Expressionism, drew analogous inspiration from the *Gestalt* of the natural object. Wright (1992 ed.: 100), in turn, derived from nature his organic functionalist position that was based on the fact that the formal appearance of all natural phenomena had evolved in response to a particular function. Unlike the adherents of Functionalism (the exponents of the Neue Sachlichkeit, in particular), Wright insisted that beauty could be functionally motivated – as indeed demonstrated by nature, and in particular by human procreation – justifying its own validity. According to functionalist doctrine, beauty did not have any autonomy except as a characteristic ascribed to an object that functioned satisfactorily. However, for the Classicists, utilitarian concerns were totally subordinate to formal preoccupations and aesthetic integrity.

2.4 THE REAPPRAISAL OF THE CLASSICAL AESTHETIC

2.4.1 Introduction

The manifestation of Christ as the son of God not only challenged ancient cosmogony but also demystified previous aesthetic aspirations and radically altered past design priorities. Although the earliest Christian churches were modelled after the Roman basilica prototype that still adhered to antiquated systems of proportion, interest in the latter was soon surpassed by liturgical considerations. The Platonic Solids, though, featured intermittently. According to Wittkower (1965; 1975: 86):

> "We have overwhelming evidence that many medieval churches were built *ad quadratum* or *ad triangulum*, reflecting a platonic pedigree. Milan cathedral is a well-known example: discussions on whether the church should be erected according to triangulation or quadrature dragged on for years."

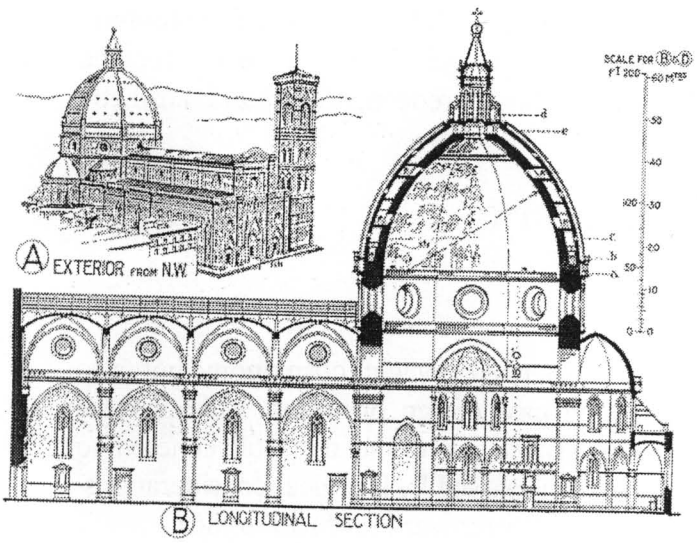
Whilst a residue of Graeco-Roman Classicism prevailed in buildings throughout Southern Europe, the pagan aesthetic lay dormant in the Middle Ages until its consecration during the Renaissance.

2.4.2 The Renaissance

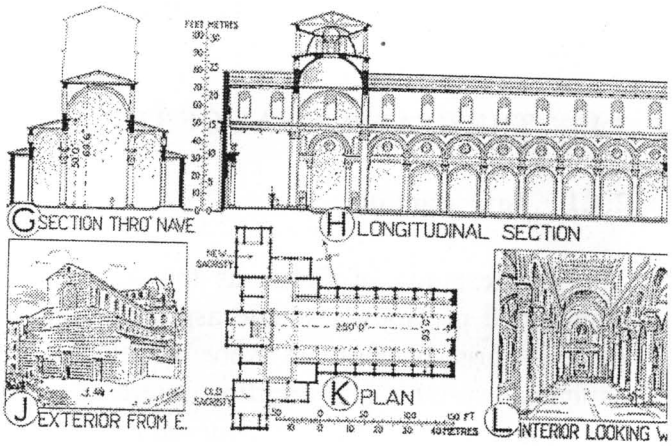
The inception of the Renaissance is ascribed to two principal factors: firstly, the recovery of original Grecian texts from the defeated Muslim invaders in Spain in 1344 and, secondly, the spontaneous decision in 1345 by Italian poet Petrarch (Francesco Petrarca, 1304-1374) to address a series of letters, entitled *De Vita Solitaria*, in Latin to prominent Graeco-Roman figures. Classical texts were selectively available throughout the Middle Ages but were mostly second-hand and had been coloured by the passage of time. The widespread availability of the original ancient texts, coupled with Petrarch's literary initiative, culminated in the intellectual movement from the mid-14th century until the 17th century that investigated antiquarian accomplishments – known retrospectively as the Renaissance.

After being neglected for more than a thousand years, the impact of classical thought, aspirations and codes of conduct was immense. It ignited a criticality and an intellectual scepticism that induced liberation from medieval subservience and anguish. Inevitably, the reconciliation of Platonic wisdom and Aristotlean logic with Christian faith was highly contentious, but it contributed substantially to reformist and secular attitudes with its far-reaching consequences.

Some contemporary historians, however, question the numerous assumptions made about the Renaissance. It is maintained that several techno-scientific inventions had been conceived of earlier, or were modifications of available data; that the magnitude of the Renaissance is generally inflated since it made only a few contributions to alter the then-prevailing socio-economical conditions and political



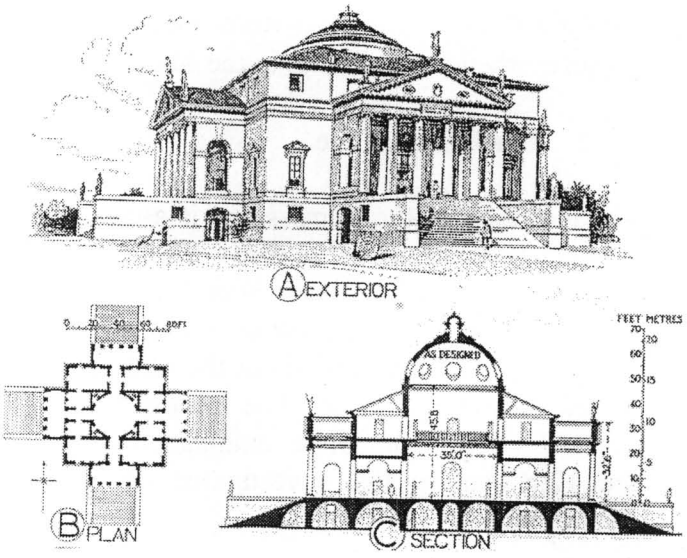
2.15 Early Renaissance: Brunelleschi, Santa Maria del Fiore, Florence (1434).



2.16 Early Renaissance: Brunelleschi, San Lorenzo, Florence (1429).



2.17 High Rennaissance: Donato Bramante (1444-1514), Tempietto, Rome (1510).



2.18 Mannerism: Andrea Palladio (1508-1580), Villa Capra [La Rotonda], Vicenza (1569).

circumstances (*New Enc. Britannica*, 1985 ed.: "Renaissance", vol 4). This retrospective criticism seems somewhat short-sighted. It cannot be denied that the reformation of ecclesiastical establishments would not have occurred and scientific curiosity would not have been stimulated, had the mindset not been radically transformed and restrictive religious dogmas challenged. Moreover, it is the magnificent achievements in the visual and plastic arts, and where the antiquarian influence is particularly discernible, that heralded the Renaissance a miraculous era.

2.4.3 The Architectural Renaissance

The reappraisal of the classical aesthetic was one of the most important consequences of the impetus elicited by the Renaissance initiative. Visits to ancient building sites in search of original manuscripts and sought-after antiques revived an appreciation for past artistic and architectural accomplishments. The recovery of a copied manuscript of the Vitruvian treatise in 1414/6 by one Poggio Bracciolini at the Saint Gall Monastery, Italy, generated additional momentum for the Graeco-Roman revival in architecture. Although the manuscript was only published in 1486, it is said to have been in general circulation long before that particular date. [9]

The subsequent classical revival was modelled on both Vitruvian dogma and research conducted on, predominantly, ancient Roman ruins in Italy, France and Spain. The discrepancies between Vitruvius' theories and artefactual evidence were disturbing until it was realized that the architect's chief source of reference had in fact been Grecian (*ibid.*).

The novel application of the Graeco-Roman design vocabulary can be traced to goldsmith-turned-architect Filippo Brunelleschi (1377-1446) who was one of the first artisans to fall under the spell of the persuasive antiquarian revival. His scholarly investigations conducted between 1402 and 1418 of mathematics, geometry and architecture, led not only to an intimate knowledge of ancient design principles but also to his remarkable algorithm of perspective. Brunelleschi's interpretation of the antiquarian design methodology was already evident in his proposal made for the contentious copula of the Florentine Duomo, the Santa Maria del Fiore (1416/8-1434, *fig. 2.15*), but was even more pronounced in his ensuing commissions, the Ospedale degli Innocenti (1419-1427) and San Lorenzo (1420-1429, *fig. 2.16*), also in Florence. [10] The enthusiast response elicited by these designs culminated in a new stylistic genre and its subsequent derivatives, generally distinguished as Early Renaissance (1418-1500), High Renaissance (1500-1527, *fig. 2.17*), Mannerism (1527-1620, *fig. 2. 18*), Baroque (1620-1715) and Rococo (1715-1750).

The classical rebirth in architecture led to the revived use of the five Graeco-Roman Orders, the round arch, and vaulted and domed methods of construction; the reaffirmation of symmetry and visual harmony; and the reinstatement of the anthropomorphic theory of proportion. According to Wittkower (1963; 1975: 86):

> "Renaissance theory and practice pronounced axiomatically that the proportions of architecture must echo those of the human body. This ancient theory lent itself to be incorporated into the Christian conception of the world. The Bible tells us that Man was created in the image of God. It logically follows that Man's proportions are perfect."

---

9 The *Macmillan Encyclopedia of Architects*, 1982 ed., "Vitruvius", vol. 4, states that the Vitruvian treatise had never been lost as often claimed, and that copied versions were circulating in the northern parts of Europe since A.D. 850 where it served predominantly as a building manual. Upon its recovery in 1414/6, the manuscript was evidently read by Petrarch, Alberti, sculptor Lorenzo Ghiberti (1378-1455) – possibly Filippo Brunelleschi (1377-1446) – amongst several others, before it was printed under supervision of one Fra Giovanni Sulpitius in 1486. The first printed edition was followed by the popular account by Fra Giocondo in 1511 and a third edition by Cesare di Lorenzo Cesariano in 1521.

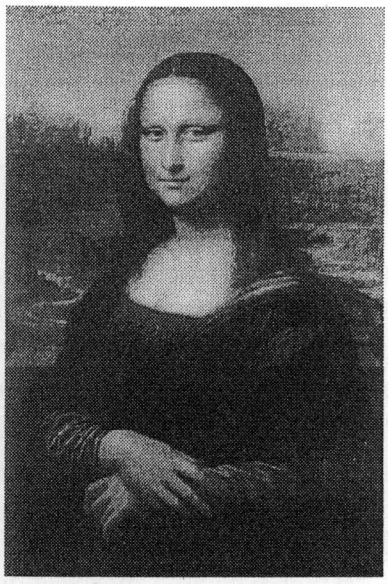
10 These dates refer exclusively to Brunelleschi's involvement since these projects were all either completed or altered once he had rendered his services.



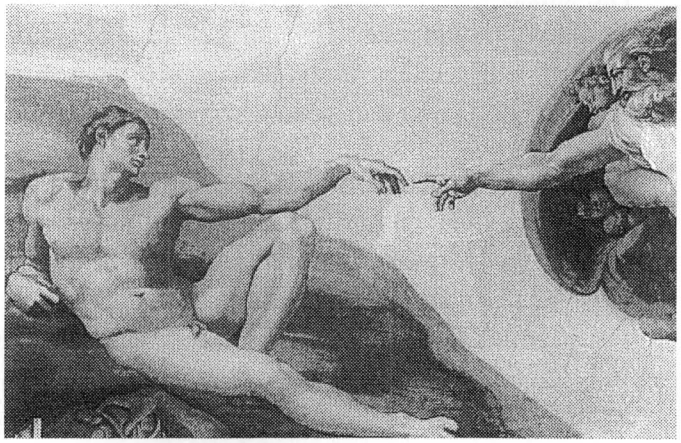
2.19 Sandro Botticelli (Alessandro di Moriano Filipepi, 1444/5-1510), *Primavera* (c. 1482).



2.20 Raphael (Raffaello Sonzio, 1483-1520), *The School of Athens* (1511).



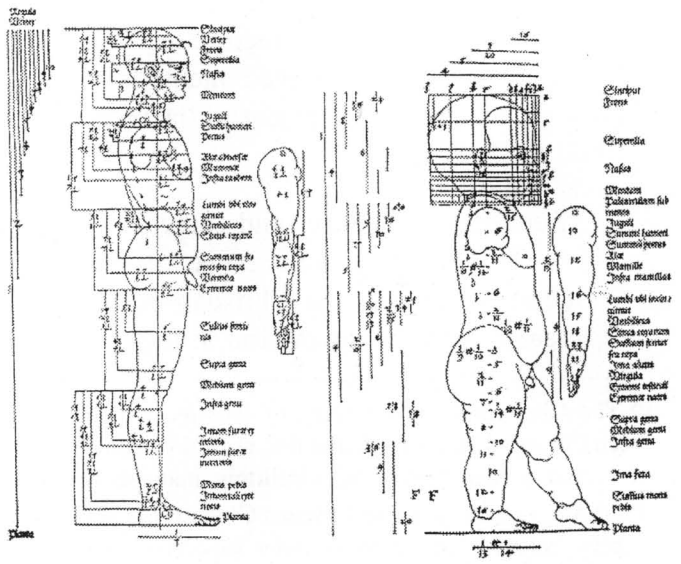
2.21 ***Chiaroscuro:*** Leonardo da Vinci (1452-1519), *Mona Lisa* (1503).



2.22 Foreshortening: Michelangelo Buonarotti (1475-1564), *The Creation of Man* (1512).



2.23 Anamorphosis: Hans Holbein (1497-1543), *The Ambassadors* (1533).



2.24 Studies of ideal human proportions by Dürer.

2.4.4 Classical Architectural Theory

The humanist example of fastidious scholarship firmly established the disciplinary approach to architectural theory. Publications promulgating the classical design idiom and mimicking the Vitruvian treatise flourished from the 15th century. Leon Battista Alberti (1404-1472), considered the progenitor of architectural theory, made a substantial contribution in this regard with his *Ten Books of Architecture*, published in 1485.

For Alberti, architecture was pre-eminently an aesthetic concept. Like Vitruvius, he insisted that proportion and harmony were fundamental to the attainment of architectural beauty – qualified in his much-quoted statement as "a Harmony of all the Parts in whatsoever Subject it appears, fitted together with such Proportion and Connection, that nothing could be added, diminished or altered, but for the Worse" (1755 ed.; 1986: book 6, ii). Even though Mannerism, Baroque and Rococo were antithetical to the clarity and repose of the earlier Renaissance examples, the underlying compositional means – symmetry, harmony, proportion and Euclidian geometry (the primary range of geometric shapes that were distilled by Euclid in his renowned compendium *Elements of Geometry*) – remained consistent features of a classical design vocabulary.

Due to the increasing complexity of architecture and its dependence on specialized knowledge of design theory, mathematics, geometry and optics, its status was promptly elevated to the Liberal Arts. Designs were no longer executed by anonymous craftsmen but by scholars of considerable social standing, many of whom received recognition in their lifetime.

In summary, classical architecture was an abstract representation of organic harmony. It was also considered a science of form, with an undisputed degree of excellence achieved when executed according to sanctioned aesthetic canons. The Renaissance Classicists categorically rejected the so-called subjective qualities of Gothicism and embraced an eternally validated aesthetic 'objectivity' – irrespective of time or place. Detached from all emotive considerations and complexities, classical architecture was considered the ultimate manifestation of intellectual contemplation, and the resultant beauty regarded as timeless and eternal – epitomizing the Platonic ideal of man-made perfection.

2.4.5 The Artistic Response

Renaissance artists and sculptors were quick to explore themes offered by Graeco-Roman antiquity and reinstate Plato's normative aesthetic ideal, to which the knowledge of perspective had greatly contributed (*figs 2.19-2.20*). The soaring of technical confidence contributed also to the ascendancy of mimetic representation over allegorical revelation. As a result, acute observation superseded medieval symbolism and stylized pictorial conventions.

With the establishment of the Academy of Plato in Florence in 1459, the philosophical notions of beauty were resuscitated, antiquarian aesthetic canons firmly entrenched, and the idealistic aspiration for artistic perfection restored (Beckett, 1994: 94). The initial impetus derived from the classical antecedent was soon surpassed by an unprecedented artistic achievement. The quest for optical accuracy and anatomical exactitude, in addition to the revived application perspective, was reinforced by *chiaroscuro* (*fig. 2.21*), foreshortening (*fig. 2.22*) and anamorphosis (*fig. 2.23*) – techniques that enabled pictorial feats unrivalled before or since. A number of mechanical devices – Alberti's Veil, the Claude Glass and camera obscura – were invented to assist the artists and ensure accurate depiction. Like architecture, the visual arts were elevated to Liberal Art status and became an academic discipline that necessitated intense study and lengthy apprenticeship.

The pursuit of artistic excellence instigated lively debate on the idiosyncratic, and the determination of the normative ideal – aesthetic preoccupations that reverberated until the mid-19th century. To conclude in the undated words of Renaissance artist Albrecht Dürer (1471-1528):

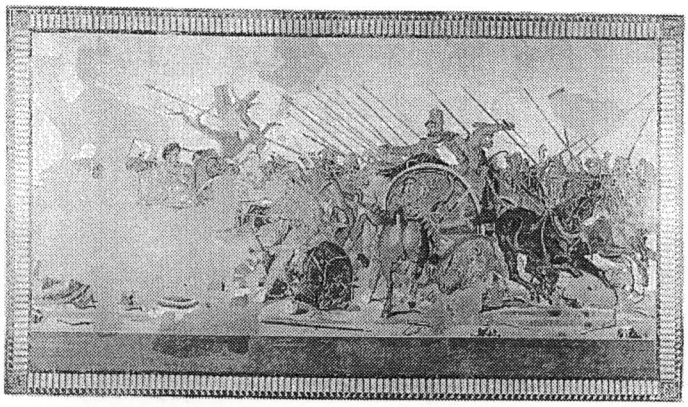
> "No single man can be taken as a model for a perfect figure, for no man lives on earth who is endowed with the whole of beauty ... I hold that the perfection of form and beauty is contained in the sum of all men." (Frayling and Van der Meer, 1992: "Proportion", n. pag., *fig. 2.24*)

2.5 SUMMARY

This chapter aimed at defining the classical aesthetic as a reference point for the antithetical position adopted by the Modernists, albeit to a varying degree.

Significantly, the classical, visual, aesthetic was derived from the aural senses, coupled with the quasi-scientific discoveries made by the ancient Greek philosophers. The numerical correspondence between musical harmony and the organizational structure of all natural and cosmic phenomena precipitated the aesthetic axiom that sensory satisfaction can be ascribed to specific algebraic ratios. Artefacts constructed according to these transcribed mathematical conventions were considered a simulation of divine perfection. The philosophical doctrines promulgated by Plato established the normative aspiration for all creative endeavour, which firmly entrenched the incontestability of man-made beauty when adhering to preordained aesthetic canons that were substantiated by mathematical certitude.

The reappraisal of the classical aesthetic during the Renaissance coincided with the recovery of *The Ten Books on Architecture* by Marcus Vitruvius Pollio in 1414/6, and the algorithm of perspective by Filippo Brunelleschi. In addition, Brunelleschi's novel application of the Graeco-Roman design vocabulary elicited an enthusiastic response and resulted in the birth of a new stylistic genre. The algorithm of perspective, in turn, enabled artists to surpass the medieval aspectival mode of visual communication. Consequently, the Platonic notions of beauty were resuscitated and the idealistic aspiration for artistic perfections restored, contributing to pictorial feats unrivalled before or since.



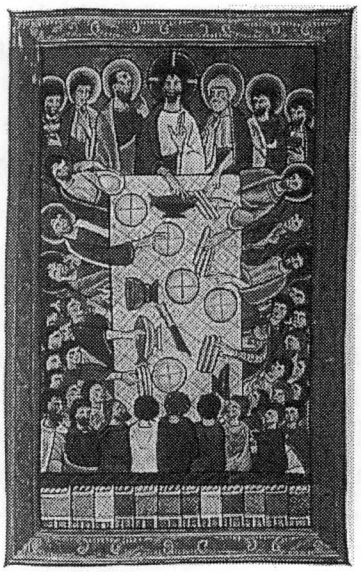
3.1 Roman mosaic of a Greek mural: Anon., *Alexander Mosaic* (c. 80 B.C.).



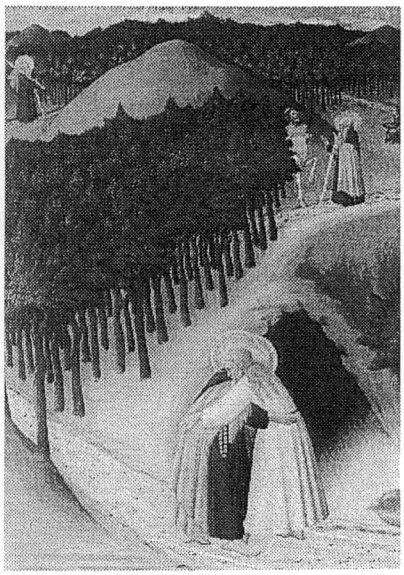
3.2 Mural by early Christians: Untitled, catacomb, Rome (c. A.D. 300).



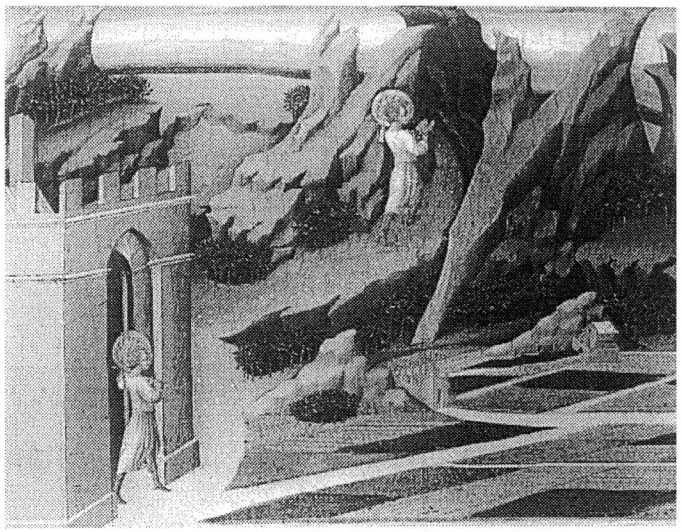
3.3 Tapestry: Anon., *The Death of Harold's Brothers*, (c. 1066-1077).



3.4 Prayer-book illustration: Anon., *The Feeding of the Five Thousand* (c. 1220).



3.5 Sassetta (Stefano di Giovanni, 1392-1450),



3.6 Giovanni di Paolo (c. 1403-1483),

CHAPTER 3 THE COGNO- PERCEPTION OF SPACE

3.1 PREFACE

To fully appreciate the antithetical position of Modernism in relation to Classicism, the pivotal role of the cognitive perception (cogno-perception) [1] of space on the pictorial and plastic arts demands attention. In this chapter consideration is given to the interrelatedness of cosmology, philosophy and the aesthetic disciplines – with the depiction of pictorial depth serving as paradigm to conduct this inquiry.

Cognizance is taken of, firstly, the intermittent development of perspective and, secondly, the paradoxical phenomenon that the depiction of pictorial depth responds directly to the cogno-perception of space, which, in turn, is indicative of a particular mode of plastic expression. This is followed by a review of the perspectival spatial perception of Classicism for the sake of contextualizing the genesis of the countering modern cogno-perception of space and its profound implications in the aesthetic arena.

3.2 INTRODUCTION

The extent of the knowledge and application of perspective during the Graeco-Roman era remains contentious. Several distinguished authors seem to be oblivious of the fact that perspective was systematically applied to the pictorial arts long before the Renaissance. This is confirmed emphatically by Robertson (1965: 215):

> "There is evidence ... that before the end of the Hellenistic age artists understood the composition of a picture on a single vanishing point; had, that is, a perspective system like that of the Renaissance." (*fig. 3.1*)

William Dunning (1991: 20), however, is of a different opinion:

> "Graeco-Roman and Renaissance perspectives, in spite of their apparent resemblance, were not the same in practice or concept."

Other scholars maintain that the ancient Greeks had a knowledge of two independent systems of perspective: the linear – applied to the pictorial arts – and the curvilinear – applied to architecture. [2]

Notwithstanding, there has been a gradual necrosis in the application of perspective from about the fourth century A.D. Prior to this period, the murals in the catacombs in Rome and excecuted by the early Christians were still in accordance with Graeco-Roman pictorial conventions (*fig. 3.2*). The demise of perspective can be traced to the official recognition of Christianity as state religion in A.D. 313, following the conversion of Roman Emperor Constantine (q.v.-337) to the Christian faith. The subsequent artistic 'retrogression' during the Middle Ages can be attributed to by the prohibitions of the Biblical Commandments, the ensuing iconoclastic movement (730-843) and the Islam example of non-naturalistic depiction. These factors, in addition to the volcanic eruptions at Pompeii and Herculaneum (A.D. 69), contributed to the obliteration of most pagan artefactual evidence.

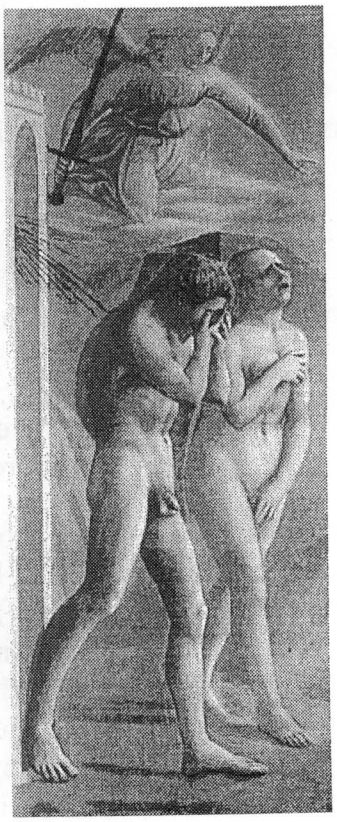
---

1 The term "cogno-perception" is derived from Dunning, R., 1991, *Changing Images of Pictorial Space – A History of Spatial Illusion in Painting* (New York: Saracuse Univ. Press), 100, and refers to the interrelatedness of the two concepts "cognition" and "perception", specifically regarding the interpretation and understanding of space.

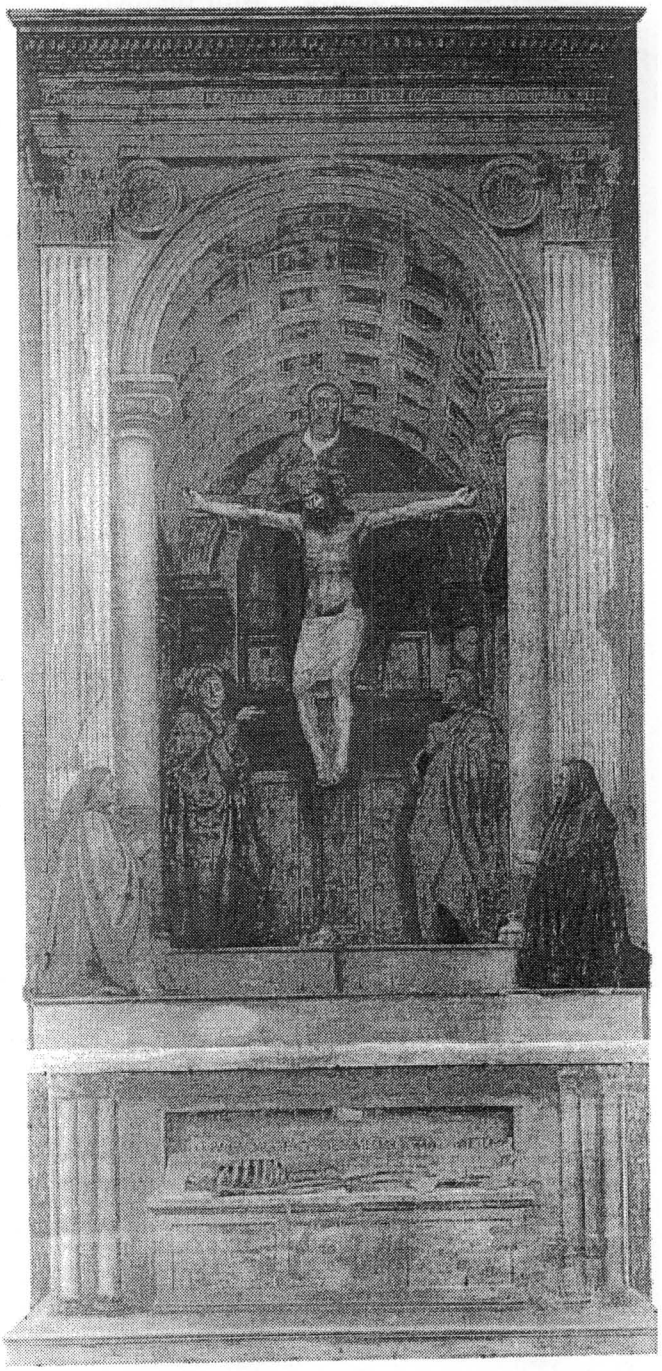
2 It is noteworthy that there are not only alternative methods of constructing a perspective, but one method is often known by different names. By way of example, linear perspective is also known as the central or collinear method. This confusion is compounded by yet another method, known as the rectilinear.



3.7 Donatello, *David* (c. 1434).



3.8 Masaccio, *Adam and Eve Expelled from Paradise* (c. 1427).



3.9 Masaccio, *The Trinity* (1425).

It is noteworthy that, save for the ancient Greeks and their Roman counterparts, none of the Nordic and Celtic tribes – as all other early civilizations globally – had any knowledge of how to create an illusion of depth on a two-dimensional surface. Moreover, the alternative media explored – tapestry, illumination and mosaic – were not conducive to any form of stereoscopic communication (*figs 3.3-3.4*). However, this does not imply that neither the inclination, nor the optical cognition existed, as some authors would have us believe. [3] Examples abound of medieval artists attempting to convey pictorial depth, but the means to do so were clearly lacking (*figs 3.5-3.6*). Nonetheless, the unselfconscious reversal to an aspectival mode of communication established, for close on a thousand years, a stylistic convention that was imbued with a 'hierarchial' symbolism instead of perceptible accuracy.

3.3 THE ALGORITHM OF LINEAR PERSPECTIVE

During the Renaissance, as in ancient Greece, the first advancements towards naturalistic representation were made in sculpture, pioneered by Donatello (Donato di Niccolo, 1386-1466, *fig. 3.7*) and Lorenzo Ghiberti (1378-1455). Masaccio (Tomasso de Giovanni di Simone Guidi, 1401-1428), considered the first Renaissance painter, is said to have been greatly influenced by these achievements (*figs 3.8-3.9*). However, Masaccio's pictorial improvements were, in addition to the example of Donatello and Ghiberti, made possible by the newly acquired knowledge of perspective. According to Renaissance biographer on art Giorgio Vasari (1511-1574) in *The Lives of the Artists* (1550):

> "With regard to painting we are indebted first of all to Masaccio, who first painted people's feet actually standing on the ground, and by doing so eliminated that awkwardness, common to all artists before him, of having figures standing on tiptoe. We must also be grateful to him for having given his figures such liveliness and relief that he deserves the same credit as if he invented Art itself." (Beckett, 1994: 86)

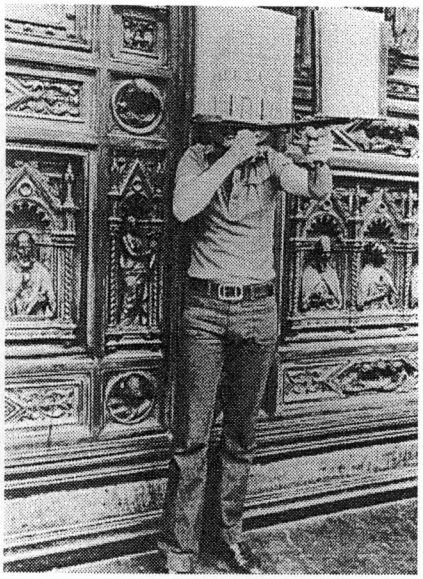
It may be no coincidence that the algorithm of perspective, dated between 1413 and 1425, was developed by Brunelleschi – an acquaintance and rival of Ghiberti. [4] The *Macmillan Encyclopedia of Architecture* (1982 ed.: "Vitruvius", vol. 4) cites Ghiberti as one of the privileged few to have been privy to the Vitruvian treatise on its recovery in 1414 or 1416. The uncertainty and proximity of these dates give rise to doubt as to the extent to which knowledge of this document could have contributed to Brunelleschi's quest for pictorial accuracy. Except for stating that "perspective is the method of sketching a front with the sides withdrawing into the background, the lines all meeting in the center of a circle", Vitruvius (1914 ed.; 1960: 14) provided no algorithmic account for the construction of perspective. Consequently, Brunelleschi's accomplishment remains unique.

Brunelleschi's achievement was developed from the premise that there existed a numerical – a proportional – correlation between the height of observation and the distance from this vantage point to that which is being observed. He conducted a simple optical experiment in which the construction lines of a projected mirror image were adjusted progressively according to sight. Evidently, Brunelleschi produced a rendering of the Baptistry in Florence, which is regarded as the first accurate perspectival image ever constructed, and according to the linear method with a single vanishing point in a horizontal plane. (See the reconstructed image by Gavin Macrae-Gibson, 1985: 41, *fig. 3.10.)*

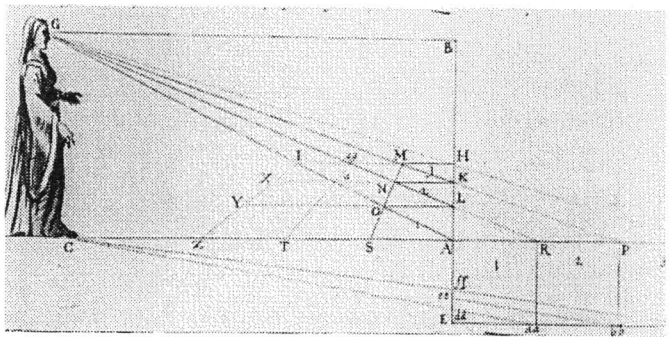
---

3 See Bührmann, H., 1982, "Origins and Development of Architectural Perception", unpublished M. Arch. dissertation, Univ. of the Orange Free State, for her opposing point of view and her theories on the implications of the aspectival versus the perspectival modes of visual communication.

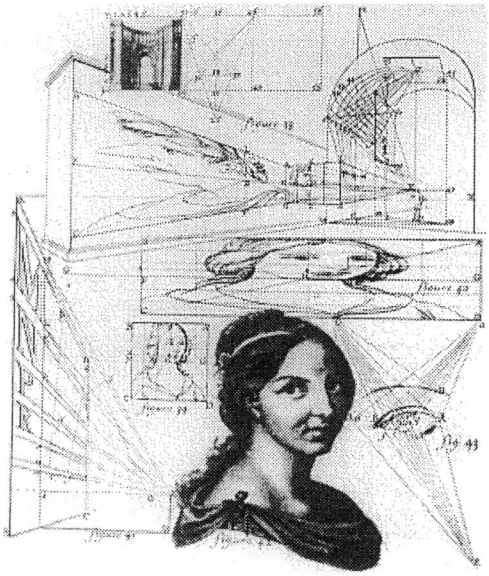
4 Brunelleschi had lost the competition for the doors of the Baptistry in Florence to Ghiberti in 1401. Soon after, Brunelleschi embarked on his scholarly pursuits. Therefore, it is plausible to suggest that Brunelleschi's optical investigations were fuelled by Ghiberti's progress in the plastic arts.



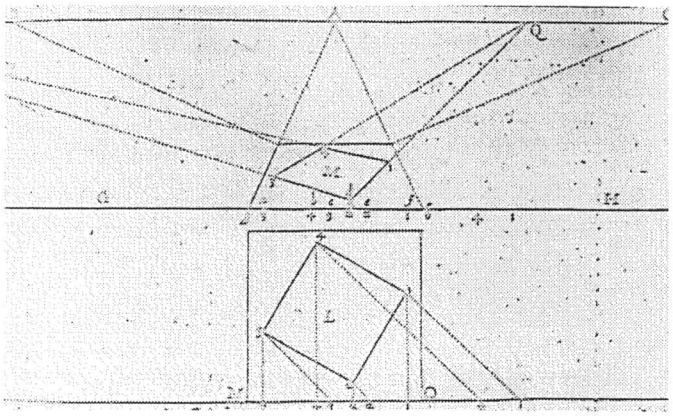
3.10 Reconstruction of Brunelleschi's optical experiment of the Baptistry, Florence.



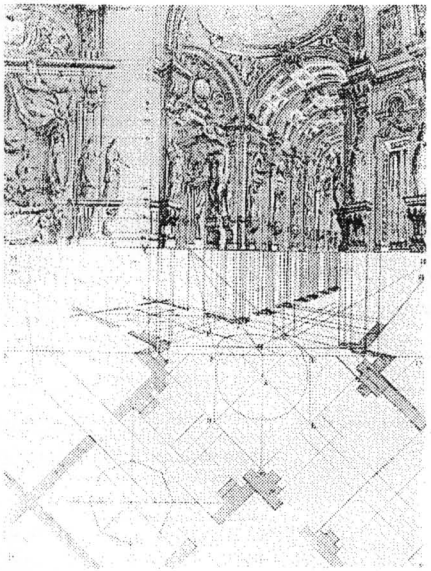
3.11 The homocentric condition established by the *Prima Regola.*



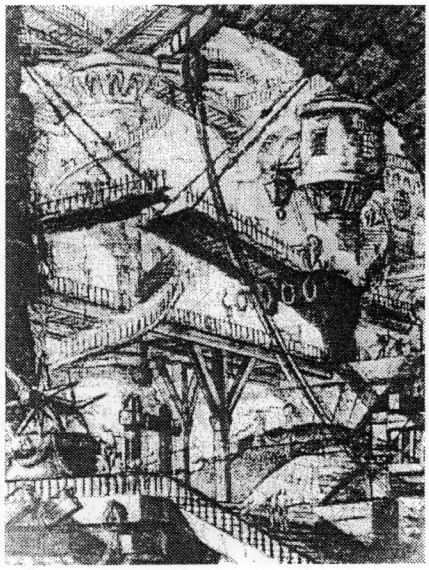
3.12 The application of linear perspective on curved surfaces by one Grégoire Huret (1670).



3.13 Vignola's *Dua Regola.*



3.14 The rectified *Dua Regola* employed by



3.15 Piranesi, *Invenzione di Carceri,*

In time, this method became known as the *Prima Regola* (or *Construzione Legittima*, as referred to by Alberti in his *Della Pittura*, published in 1453) and it held sway as the orthodox means with which to create perspectival illusion for over two hundred years (*figs 3.11-3.12*). The *Seconda* or *Dua Regola*, based on dual vanishing points, was developed by Giacomo Barozzi da Vignola (1507-1573) in 1583, but its method of construction, according to Macrae-Gibson (1985: 42-43), was faulty (*fig. 3.13*). This was only rectified in 1711 by a Venetian scenographer, Ferdinando Galli de Bibiena (q.v.), who utilized it to great effect (*fig. 3.14*), as did Giovanni Battista Piranesi (1720-1778, *fig. 3.15*).

3.4 CURVILINEAR PERSPECTIVE

Intermittent attempts were made at disproving the optical accuracy of the linear method of perspective, but success was only achieved during the 19th century. Of the alternatives that were developed (including the rectilinear),[5] only the so-called curvilinear method – that relied on a vertical vanishing point – was formulated the most comprehensively. It also comes closest to human sight since it corresponds to the curved structure of the eye. Although curvilinear perspective never gained widespread application, it did contribute to the debate on observation, representation and illusion – a favourite topic during the 19th century (Kemp, 1987: 30-34), and of particular relevance to this study.

Protagonists of the curvilinear method of perspective cite the ancient Greeks as evidence of its employment to reinforce visual observation. During the late 19th century, a "Theory of Vision and Representation", published in *Die Subjektiven Perspektive und die Horizontalen Curvaturen des Dorischen Styls* (1879), was formulated by Guido Hauck, a German professor of Descriptive Geometry. Hauck contended that although the curvilinear method corresponded accurately to vision, we have, as a result of linear perspective, become so conditioned that our perception of what we see has become clouded by what we know. We know that the vertical lines of a building are straight even though we don't see them as being straight. Hauck's contentions are presented by Martin Kemp (*ibid.*: 34) as follows:

> "In terms of pictures, we are conditioned to see what is objectively wrong as subjectively right, and what is objectively right as objectively wrong. Only relatively unsophisticated and ignorant observers – 'women' and 'natives' are instanced! [*sic*] – will see the curves in an innocent manner. The Greek designers came into the knowledgeable category, and their buildings were designed with curves so that the ones that were objectively wrong should look objectively right."

Kemp (*ibid.*: 33) adds:

> "The most productive line of [the 19th century] debate centred upon the possibility that the Greek designers were endeavouring to counteract illusions or vagaries in the processes of sight and perception."

Any deliberate adjustments made to rectify notions of perception, would, according to Hauck's theory, only be necessary if there had been a conditioning towards the linear mode of perspective, as was the case since the Renaissance. (This train of thought resuscitates the question of the extent to which the ancient Greeks were familiar with both systems of perspective.) However, these academic speculations were only to a lesser extent grounded in alternative modes of visual communication. Their principal objective was to explain a specific artistic or architectural peculiarity in optical-perceptual terms.

---

5 Kemp, M., 1987, "Perspective Rectified – Some Alternative Systems in the 9th Century", *AA Files*, no. 15: 31, describes the rectilinear method of perspective as relying on "rectilinear convergence towards the vanishing-points in or beyond the lateral and upper boundaries of the picture plane".

Notwithstanding, Hauck's controversial theory on cognition – as a product of visual conditioning – impacted on the contentious anthropological debate of the early 20th century, which implied that perspective *per se* materialized as a cultural phenomenon; was indicative of a certain manner of thinking; and manifested in (or contributed to) artefactual evolution. Art psychologist Rudolf Arnheim (1954; 1974: 283) remarks:

> "It is significant ... [that] central [linear] perspective ... was discovered at only one time and place in man's entire history. The more elementary procedures for representing pictorial space, the two-dimensional 'Egyptian' method as well as isometric perspective, were and are discovered independently all over the world at early levels of visual conception. Central [linear] perspective, however, is so violent and intricate a deformation of the normal shape of things that it came about only as the final result of prolonged exploration and in response to very particular cultural needs."

3.5 SPATIAL COGNO-PERCEPTION

The algorithm of perspective – regardless of the system employed – is highly significant for a number of varied, though interrelated, reasons:

1. It provided an accurate pictorial technique for creating an illusion of depth on a two-dimensional surface, assisting artists and architects alike.

2. It contributed to the scientific understanding of the mechanics of the eye and sight which, in turn, assisted in the development of optical devices.

3. The recognition of perspective as a proportional condition reaffirmed the status of the proportion as the primary means of compositional organization, applicable to both the pictorial and the plastic arts.

4. Most importantly, the self-conscious act of organizing pictorial space decisively influences our perception of that space, and also our perception of ourselves in relation to space *per se*.

Helen Bührmann (1982: 5, 11) points out:

> "Aspective aims at true representation of only the object or image, whereas perspective depicts the object in relation to [the] space in which the object is found ..."
> "Perspective and aspective are two different methods the mind employs to achieve order in the process of creating concepts ... [they colour the] perception and understanding of all things real and unreal, and must therefore influence philosophical attitudes." [Emphasis added by author.]

In order to comprehend the full implications of the manner of the depiction of pictorial depth, attention is drawn to the following:

1. Our perception – as a physiological phenomenon – of space has changed during the course of history.

2. Our cognition – as mental comprehension – of space is directly related to the availability of cosmological data – whether speculative (antiquarian), religious / superstitious (medieval), or scientific (post-Galilean, post-Newtonian, post-Einsteinian).

3. All these mentioned cosmological (or cosmogonal) positions are either indicative of a certain philosophical attitude – the geocentrism of ancient Greece and the theocentrism of the Middle Ages – or gave rise to a particular philosophical premise – the homocentric position adopted during the Renaissance and surpassed by the mechano-centrism from the 18th century onwards.

4. These respective philosophical premises correspond to a particular spatial cogno-perception that, remarkably enough, coincides with the manner in which pictorial depth has been communicated. This consistent feature in the evolution of the pictorial arts leaves much room for theorizing. It can most convincingly be ascribed to the fact that our preconceptions – predominantly cultural – enable or disable our collective, or respective, cogno-perceptions of our existence that manifest in our manner of visual communication.

5. These alternating cogno-perceptions are a recurring theme in the respective aesthetic arenas because of their close alignment with the notion of space – whether depicting space (painting), enclosing space (architecture), or manipulating space (sculpture and modern architecture, in particular).

6. It is paradoxical that the pictorial arts – incidentally, the most difficult medium with which to convey space – would be the vehicle by means of which these respective spatial cogno-perceptions, corresponding with a specific philosophical disposition, have been communicated; that the manner in which we organize pictorial depth has an impact on – or coincides with – the manner in which we give expression to architectural space.

In summary, our limited cognition of cosmic space, at different points in time, contributes to, firstly, our perception of space, secondly, the manner of its pictorial depiction and, thirdly, our expression of plastic space.

These assertions find support in Pierre Francastel's essay "The Destruction of a Plastic Space" (1951; 1963: 380-381, 396):

> "... the mode of rendering space modif[ies] itself in line with deep changes in technological and theoretical knowledge along with changes in beliefs and motives for action in any given society. If a certain plastic space symbolizes the general activity and the mathematical, physical and typographical notions of a society, it is inevitable that it change[s] whenever the society itself changes sufficiently."
> "... the main thing to understand is that no plastic representation of space can be divorced from its context of intellectual and social values."

3. 6 ALTERNATING COSMOLOGICAL PARADIGMS

In order to expand on the aforegoing, a reflection on the alternating cosmological paradigms is deemed necessary.

The Greek cogno-perception of space corresponded directly to their speculations on the origin and format of the universe. In the words of H. F. Cornford from *Plato's Cosmology* (1937):

> "In the cosmology of classical Greece ... the universe of being was finite and spherical, with no endless stretch of emptiness beyond. Space had the form of ... a sphere with centre and circumference." (Burgin, 1987: 35)

The Greek notion of space, according to such a definition, was derived from a geocentric philosophical attitude that related to mathematical pursuit and Euclidian geometry, reinforced by visual observation. According to Victor Burgin (1987: 36), the classical conception of space "seems to have been based upon visual evidence ... the horizon appears to encircle us, and the heavens appear to be vaulted above us". [6]

This interpretation was superseded by the 'flat earth' theories and theocentric position of the Middle Ages, which Burgin (*ibid.*: 35-36) describes as follows:

> "In medieval cosmology, supercelestial and celestial spheres encompassed, but did not touch, a terrestrial sphere – the space of human action – in which every being, and each thing, had a place preordained by God and was subject to His omnivoyant gaze."

Religious conviction found both support and expression in the aspectival mode of pictorial representation. Since no hierarchial distinction was made between the location of the subject matter, except for symbolical purposes, the aspectival endorsed the Biblical dogma of the equality of all Mankind (everybody rendered to the exact same scale, irrespective of were they appear on the picture plane) and their relationship to the omnipresent Creator of the universe (depicted to an inflated scale). As the aspectival could not have precipitated the theological disposition – and was instead indicative thereof – the extent to which this method of visual communication was a calculated response to religious doctrine remains open for debate; as does the extent to which "likeness" – according to Biblical Commandment (and prohibition) – could self-consciously have been equated with the pictorial depiction of depth. Francastel (1951; 1963: 397) is of the opinion that medieval artists did so "simply" out of reverence for God, refusing to "locate things or divine personages in a space that is in the slightest way illusionistic".

In turn, the Renaissance cogno-perception of space coincided with both the algorithm of perspective and the controversial scientific discoveries of Galileo Galilei (1564-1642), which demanded acceptance of the infinity of space. Although the earth was no longer perceived as flat, or the universe as finite, Euclidean geometry and the corresponding geocentric position regained its former prominence, but derived from a different premise. Burgin (1987: 36) notes that during the Renaissance the conflict between "observation and intellection, between hyperbolic and Euclidean space, was played out during the early stages of the invention of perspective". Francastel (1951; 1963: 380) adds that the "plastic Renaissance space [Euclidean configuration of space] is not a perfected representation of what 'space' is, but only a singular apt expression of a world order for one era and for a given body of men".

Euclidian geometry implies that space extends infinitely in three directions, projected from a specific point of observation, which linear perspective had firmly established. This is paraphrased by Burgin (1987: 36) as follows:

> "The effect of monocular perspective, however, is to maintain the idea that this space does nevertheless have a centre – the observer. By degrees the sovereign gaze is transferred from God to Man."

Significantly, the never-ending vanishing point coincides with the notion of infinity. Macrae-Gibson (1985: 41) refers to the way in which the monocular relationship between the eye and the vanishing point had, because of Brunelleschi's optical experiment, entrenched a homocentric Renaissance identity:

---

[6] See also Vitruvius, 1914 ed.; 1960, *The Ten Books on Architecture*, trans. Morgan, M. (New York: Dover), 249-277, for his descriptions of the universe and other astrological data.

> "The human eye became the center of the world shown in the image, just as man became the center of the world shown in the Vitruvian figure. Both symbolized the cosmic balance existing in the mind of the Renaissance humanist between the microcosm of man and his works and the macrocosm of God and His works."

Macrae-Gibson (1985: 42- 43) also draws attention to Vignola's difficulty in reconciling the existence of dual vanishing points with this particular philosophical contention:

> "The inescapable fact presented by the second method – two vanishing points instead of one – left Vignola with a philosophical problem ... [he] had been unable to accept the conceptual framework of the two-point method because of his inability to conceive of man as anything but a microcosmic representation of macrocosmic harmony ..."

The ultimate acceptance and widespread application of the *Seconda* (or *Dua Regola*) from the 18th century onwards, coincided with an enlightened mindset and the consequent rejection of the egocentric, or homocentric, point of view. Whereas the depicted object had previously been defined, exclusively, in terms of Man and his sighting thereof, the artefact was henceforth selected as the primary preoccupation – a condition indicative of the Newtonian cosmological paradigm, the resultant Industrial Revolution and ensuing materialistic (and materialist) dispositions. By way of example, Macrae-Gibson (*ibid.*: 45, 44) cites Piranesi's *Invenzione Capric di Carceri* (*fig. 3.15*):

> "The inhabitants of Piranesi's world, are, in fact, not governed by any human order, but are adrift in a world whose law is fashioned and implemented only by objects ..."
> "A fundamental change in the perception of man's place in the world has occurred ... man has lost his centrality in the universe."

Finally, the development of quantum physics during the early 20th century contributed significantly to the modern cogno-perception of space, which altered, yet again, our attitude and our relationship to the object. The 'Einsteinian' cosmological paradigm, resulting from the publication of the *Special Theory of Relativity* by Albert Einstein (1879-1955) in 1905, emphasized the relativity of both the object and observer – conditions promptly exploited artistically and, ultimately, architecturally.

In the words of Francastel (1951; 1963: 383, 384-385):

> "During [the Renaissance] men dwelt in a physical, topographical, imagined space controlled by fixed laws of representation ... And indeed it is true that the plastic space was the first thing overturned by a modern society shaped by the French Revolution, and even more by the industrial and technical revolution stimulated by the scholarly disciplines of the 18th century ..."
> "... to have true creativity and a new plastic idiom, progress in thought and in technology must be concurrent."

In summary:

1. The ocular, perspectival mode of visual communication of Greek art coincided with a geocentric philosophical attitude and an observational experience (rather than an expression) of architectural space.

2. The unselfconscious, aspectival mode of pictorial representation of medieval art was indicative of a theocentric philosophical attitude that coincided with a hierarchial, symbolical expression of architectural space as manifested in liturgical structures.

3. The algorithmic, perspectival mode of Renaissance painting gave rise to a homocentric philosophical attitude that endorsed a monocular, perspectival perception of space, though geometrically expressed.

4. The self-conscious, aspectival mode of modern art corresponded to an existential philosophical attitude based on notions of relativity that manifested in a predetermined, multi-focal, experiential spatial expression – expanded upon in ensuing chapters.

3.7 THE PERSPECTIVAL SPATIAL EXPERIENCE

As indicated, the classical cogno-perception of cosmic space changed from finite to infinite; from geocentric to homocentric. These fluctuating dispositions were derived from acute visual observation, reinforced by a knowledge of perspective and Euclidian geometry. Therefore, it can be advanced that both the classical perception and conception of plastic space was intrinsically perspectival and depth-related, but was never considered, nor conceived of, independent of its formal container – that is, independent of geometric form.

As ancient Graeco-Roman buildings had always relied on axial symmetry (since it matched the structural organization of all natural phenomena), the algorithm of linear perspective not only reaffirmed the "symmetry neurosis" (Zevi, 1978: 17) of classical architecture – "the most noble and divine feature" according to Alberti (1755 ed.; 1986: book 6, ii) – but also endorsed monocular observation. Consequently, Renaissance architects, like their ancient forebears, intentionally designed their buildings to be observed from a fixed vantage point (exemplary, also, of classical painting) – irrespective of the number of vanishing points. By the same token, it can be argued that all classical buildings are conducive to a perspectival mode of observation because of a predetermined symmetrical composition.

Although buildings designed in the Mannerist, Baroque, or Rococo idiom invited a far greater degree of movement through different spaces, the optical experience was still dependent on an authoritarian, monocular position of observation (based on a prescribed route) in order to take full advantage of the ocular adjustments that were deliberately introduced. Examples abound of how architects, after the High Renaissance, intentionally conceived of their buildings to induce optical illusions and reinforce visual observation. The converging of walls, gradual rise of floor planes, simultaneous slanting of ceilings, incremental diminishing of column intervals, fascination with the ellipse (the distorted circle), advent of *trompe l'oeil*, extensive use of mirrors, and so forth, all conspired to intensify the drama of visual observation. However, these devices mimicked and exploited the illusion of depth rather than space *per se* (or volume, for that matter).

The notion of infinity also contributed to these optical deliberations and which the single vanishing point reinforces in a linear direction. This finds support in the following statement by Bührmann (1982: 14):

> "The spatial organization of the Baroque became influenced by the idea of infinity in a linear sense, as an indefinitely extended perspective, through the infinite in the field of mathematics. For the first time in history, gardens and highways were incorporated, as all essential parts of the architectural composition and were placed by this means in direct and obvious relation with unending extension of space. Versailles is one of the great examples of such a creation. The total effect stood as a model of the Baroque universe and retained this characterisation of infinity."

In conclusion, the prominent role of perspective in, firstly, the entrenchment of the classical ideal of beauty, secondly, the establishment of a corresponding spatial perception and, thirdly, the manifestation of a particular means of plastic expression cannot be over-emphasized. Moreover, it was the self-conscious reversal to the perspectival mode of visual communication during the Renaissance that consecrated the classical design idiom. Most importantly, it was ultimately the intentional violation of perspective that heralded the genesis of modern art and introduced an entirely new mode of plastic expression. Henceforth, attention is directed to this self-conscious induction of the aspectival and its far-reaching implications for the entire spectrum of the aesthetic disciplines.

3.8 SUMMARY

In order to appreciate the paradoxical position of Modernism in relation to Classicism, the pivotal role of the cogno-perception of space on the pictorial and plastic arts had to be examined. The self-conscious – or unselfconscious – act to organize pictorial depth coincides with our cognitive perception of space, and draws attention to the interrelatedness of cosmology, philosophy and the aesthetic disciplines.

Despite a fair degree of contention, it is safe to assume that the ancient Greeks had substantial knowledge of perspective, derived from acute observation and reinforced by mathematical pursuit. The Greek cogno-peception of space was derived from a geocentric philosophical attitude, entrenched by Euclidean geometry, but perceived as finite. The conception of architectural space was not an independent consideration, but rather the consequence of geometric form and with perspectival adjustments encouraged to reinforce visual observation.

By contrast, the gradual necrosis of perspectival depiction during the Middle Ages resulted in the, presumably, unselfconscious reversal to the aspectival, that was compounded, if not endorsed, by religious dogma. The aspectival mode of visual communication, indicative of this theocentric philosophical attitude, matched the hierarchical, symbolic expression of architectural space as demonstrated in liturgical structures.

The scholastic initiative engendered by the reappraisal of classical achievement during the Renaissance culminated in the algorithm of linear perspective by Filippo Brunelleschi, which, once again, enabled the depiction of depth on a two-dimensional surface. The single vanishing point of linear perspective reinforced Galileo Galilei's contention of the infinity of space, though projected from a specific point of observation, which, on the one hand, entrenched the homocentric philosophy synonymous with the Renaissance and, on the other hand, endorsed the perspectival perception and organization of plastic space.

The ultimate acceptance of the two-point perspective coincided with the repudiation of the egocentric point of view during the Enlightenment, which was indicative of an artefactual preoccupation, the Newtonian cosmological paradigm and ensuing materialistic dispositions.

The rejection of perspective and the self-conscious reversal to the aspectival during the 20th century coincided with the prevailing Einsteinian cosmological paradigm, which gave rise to a new conception and expression of plastic space – investigated in the following chapters.

CHAPTER 4 THE MECHANIZATION OF VISION

4.1 PREFACE

The overruling purpose of this study is to indicate that the visual arts provide a legitimate model for tracing the evolution of modern architecture. This is supported by the following: firstly, in contrast with their architectural counterparts, the artists of the mid-19th century were foremost in discarding the classical ideal of beauty. Secondly, the aspectival mode of visual communication introduced radically different creative aspirations that manifested in a completely new spatial perception and mode of plastic expression. Thirdly, modern art – via Cubism – was the seminal influence on the codification of a modern architectural vocabulary during the embryonic years between 1917 and 1933.

Whilst acknowledging the catalytic role of the Industrial Revolution on the appropriation of a contemporaneous architectural idiom, this author maintains that it was the paradigm shift in the visual arts – resulting from the advent of photography – that heralded the inception of a novel design methodology, corresponding modern aesthetic and new spatial resolution.

To qualify this statement, a brief assessment of the Enlightenment, the Industrial Revolution and the role of photography is deemed necessary. In addition, a synoptic review of the evolution of modern art contextualizes the genesis of Cubism and the self-conscious reversal to the aspectival.

4.2 INTRODUCTION

The transition from the so-called Age – or rather Epoch – of Faith to the supposed Age of Reason concurred with the gravitational theorems of Isaac Newton (1642-1727) that necessitated an acute reappraisal of past celestial views. This introspection culminated in the breach with claims of faith, based on divine assumption, and the embracing of science, founded on deductive enquiry and empirical confirmation. The retrospective distinction, the Enlightenment (presumably dating from the publication in 1686 of Newton's theorems in *Philosphiae Naturalis Principia Mathematica*), pertains to the pervasive intellectual climate and the soaring confidence in the capabilities of Man, particularly regarding his recourse to scientific cosmological explications. The *New Encyclopædia Britannica* (1985 ed.: "Enlightenment", vol. 4, 559) describes the Enlightenment as follows:

> "... a movement of thought and belief, developed interrelated conceptions of God, reason, nature and man to which there was wide assent during the 17th and 18th centuries. Its dominant conviction was that right reasoning could find true knowledge and could lead man to felicity. The ancestral ideas of the Enlightenment reach deep into ancient Greece ... The great geniuses of the 17th century confirmed and amplified the concept of a world of calculable regularity, but, more important still, they seemingly proved that rigorous mathematical reasoning offered the means, independent of God's revelation, of establishing truth."

Persistent scientific curiosity, spawned by an enlightened mindset, culminated in the harnessing of mechanical power and the genesis of industrialization, and gave rise to the so-called Industrial Revolution, [1] dating from the mid-18th century. The advent of mechanical devices – spinning and

---

1 According to the *New Encyclopædia Britannica*, 1985 ed., "Industrial Revolution", vol. 20, the reference "Industrial Revolution", although first used by certain French authors, was popularized by English historian Arnold Toynbee (1852-1883) when he described England's economic development from 1760 to 1840. The term has since found broader application and now pertains to the revolutionary changes that evolved globally as a result of industrialization.

weaving machines (c. 1764), the steam engine (c. 1765), steamboat (1807), railway locomotion (1825) and internal combustion engine (c. 1826) – set in motion a successive chain of inventions that, in the course of events, resulted in profound technological, economic, social, cultural, political and even moral transformations. Techno-scientific advancement radically altered human expectations, aspirations, behaviour and, ultimately, existence.

Yet, the actual metamorphosis of society occurred only at the end of the 18th century – first in England and somewhat later in Central Europe – when vast populations abandoned their traditional agrarian pursuits in favour of new ways of working and living in a completely different environment. This occurrence heralded the birth of the factory system, [2] the industrialized society and the demagogic associations with 'the machine': mechanization had assumed command. The paradigm shift that occurred as a result of these fundamental changes constitutes the essence of the Industrial Revolution – the major determinant of modern existence and a recurring theme when tracing the origins of modern art and modern architecture. According to Robert Heilbroner (1980:19):

> "[The Industrial Revolution] was the most important revolution, from the point of view of shaping modern society, that ever took place – fundamentally more disturbing than the French, the American, or even the Russian Revolution."

In hindsight, the calamities associated with modern life can in one way or another be traced to the Industrial Revolution, since both successes and failures of contemporary existence are direct consequences thereof. The impact of the Industrial Revolution was equally pronounced in the architectural arena, serving as the primary focus of theoretical discourse from the Enlightenment onwards. During the second half of the 20th century, the by-products of industrialization became painfully evident and demanded urgent reassessment. Once again, architectural debate and design expression responded accordingly, reflecting the transition from the industrial to the post-industrial, and ecologically sensitive, paradigm.

4.3 MECHANIZATION TAKES COMMAND

Mechanization enabled a constant supply of mass-produced merchandise that reached wider audiences and created a greater distribution of wealth. Just as pioneering Scottish economist Adam Smith (1723-1790) had predicted in *Inquiry into the Nature and Causes of the Wealth of Nations* (1776), the lure of profit and material gain – based on supply and demand – generated the necessary impetus for the conversion of the feudal system to the market-oriented economy synonymous with Capitalism. [3] Although the advent of the machine required a smaller expenditure of human energy, mechanical production was, paradoxically, entirely dependent on a stable work-force. Hence Smith's recognition that labour was an intrinsic source of value – a commodity measurable in monetary terms – that had initially defined the economic aspirations of the bourgeoisie, but had dictated in time the socio-political demands of the proletariat.

---

2 In the *New Encyclopædia Britannica* (1985 ed.: "Industrial Revolution", vol. 20) attention is drawn to the fact that it was not the first time that people worked collectively under close supervision. The medieval guild system, the Gobelin tapestry works in France and the wool industry in England operated on a similar basis and had existed for quite some time. It was, though, the first time that machines were used, and that such large numbers of people were subjected to the discipline of this new means of mechanized production.

3 Heilbroner, R., 1980, *The Worldly Philosophers – The Lives, Times and Ideas of the Great Economic Thinkers* (New York: Touchstone), 24-28, points out that Capitalism is often erroneously assumed to have been caused by the Industrial Revolution. In fact, it existed long before since investment capital was one of the prerequisites for industrialization. The Industrial Revolution merely changed the source of accumulated capital from land ownership to commerce, banking and industrial production.

The transferral of customary sources of wealth and privilege from former landowners to industrialists and an ever-increasing middle-class soon translated into the conversion of political power. This culminated in the American War of Independence of 1776, the French Revolution of 1789 and the parliamentary victory of the British Labour Party in 1830, whereupon aristocratic and autocratic rule was surrendered to democratic and egalitarian principles – albeit selectively implemented.

The sweeping social and cultural changes emanating from the revised societal organization had further ideological ramifications, especially regarding the status of the work-force that sustained the industrial mechanism. Moreover, the building of factories and housing facilities rapidly increased the toll on existing cities or demanded the establishment of new ones. The lack of the necessary infrastructure to cope with large concentrations of people, unsatisfactory working and living conditions, and poor remuneration for tedious tasks gave rise to the utopian and socialist sentiments with its far-reaching socio-political consequences that continue to reverberate into the late 20th century.

It is not the intention to give an overview of the consequences of the Industrial Revolution. However, cognizance must be taken of the technological advancements that affected the building industry and allied disciplines. These included the development of new building materials – the mass-production of cast-iron, steel and reinforcing for concrete, and the widespread availability of glass; the exploration of new energy sources derived from fossil fuel and motive power; the advent of new modes of transport and communication; and the emergence of the engineering profession during the mid-18th century, [4] due to the urgent requirement for specialized knowledge that resulted from mechanization.

The architectural profession, in particular, was profoundly affected by these new initiatives in that it was confronted with unprecedented design challenges that required a complete review of past conceptual premises and planning strategies. This manifested, firstly, in the demand for new building typologies. Secondly, it called for the design of industrial cities that could accommodate the rapidly expanding urban population and facilitate new means of transport, but, just as in the former instance, for which no empirical model existed. Thirdly, newly developed building materials made it possible to meet some of these demands, but specific skills and building techniques were required with which neither architects nor artisans were acquainted.

Within such a context, it is not surprising that the architecture of the 18th and 19th centuries was characterized by the eclectic conglomerate of revival (and 'survival') styles. This stylistic appropriation signified a frenetic search for an architectural language that could reflect the industrial *Zeitgeist*, embrace technological progress, and address modern man and his newly acquired lifestyle. As past stylistic precedents proved increasingly inadequate to meet contemporaneous demands, the more effective – and economically viable – solutions implemented by the engineering profession amplified the prevailing semantic vacuum.

4.4 AESTHETICS AS MORAL DILEMMA

As the classical ideal of man-made beauty was the embodiment of mimetic representation, aesthetic judgement was limited to the degree of success with which reproductional excellence was achieved. Moshe Barash (1985:114) points out:

---

4 It is noteworthy that the first school of engineering, L'Ecole des Ponts et Chaussées, was founded in Paris in 1747.

> "Not a single Renaissance treatise fails to make the point that the imitation of nature is the very aim of painting and sculpture and the more closely a work of art approaches this aim the better it is."

Moreover, since Plato posited the existence of an absolute beauty and qualified normative aesthetic aspiration accordingly, the artistic disciplines acquired an ethical dimension. Art historian Ernst Gombrich (1960: 100) distinguishes the classical artist as "a special kind of person who [had to] purify the world of matter, erase its flaws and approximate it to the ideal". According to such a finite denotation, the classical artist had a moral obligation to society to reproduce the 'perfect' and the 'universal', instead of the 'imperfect' and the 'particular'. Art was produced predominantly for the benefit of society, to set an example in respectable conduct and to hone the visual sensibilities of its audience.

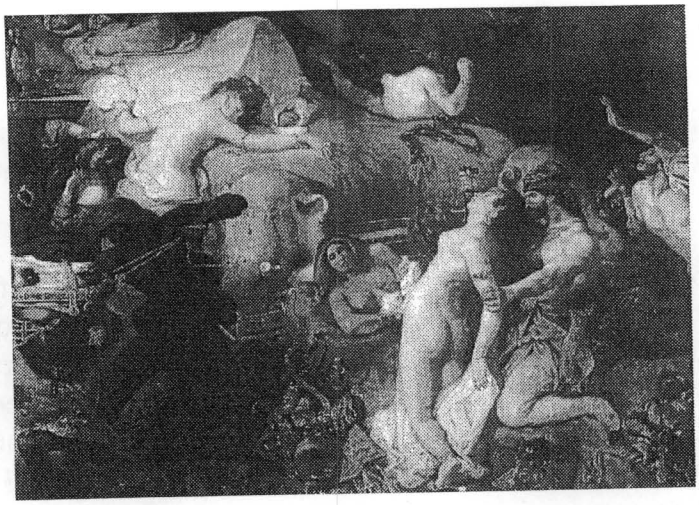
Because of the probing mindset engendered by the Enlightenment, it was inevitable that the philosophical debate of the 18th century would touch on the validity of aesthetics as an ethical issue. Following an acute study of natural science, the philosophers of the Enlightenment propagated a notion of "what ought to be":

> "... there was a distinction between the natural law that kept the planets in their course and the natural law that pertained man. When the assumption and methods of the natural synthesis were applied to social problems, they required a significant modification. Hence it was necessary to say that natural law prescribes in certain realms what is, others what ought to be." [Emphasis as quoted from the *New Enc. Britannica*, 1985 ed.: "Enlightenment", vol. 4, 600.]

Scholars maintain that it was due to the recognition of the shortcomings of the human condition in terms of what should be, that the Enlightenment manifested as critical, reforming and, ultimately, revolutionary (*ibid.*). This critical outlook prevailed not only in the socio-political arena, but permeated also aesthetic discourse.

Scotsman David Hume (1717-1777) – a close acquaintance of Jean-Jacques Rousseau (1712-1778) – was the first philosopher of the Enlightenment to question the so-called objective premises of Classicism. Hume stated emphatically that reason was incapable of aesthetic judgement, which he formulated in *Of the Standard of Taste* (1757). He moreover argued that neither the definition, nor the appreciation, of beauty could be absolute or objective; that beauty, in the final analysis, was merely a matter of opinion (Thilly, 1993: 367-381), giving rise to the dictum *de gestibus non est disputandum* (one cannot argue about taste). Dunning (1991: 93) mentions that Italian philosopher Giordano Bruno (q.v., 1500s) preceded Hume in this regard since he foresaw "the departure from classical formula toward more reliance on the personal genius and intuition of the individual when he stated that the only valid rules in art are those created by the artist, and that there are as many true rules as their are true artists".

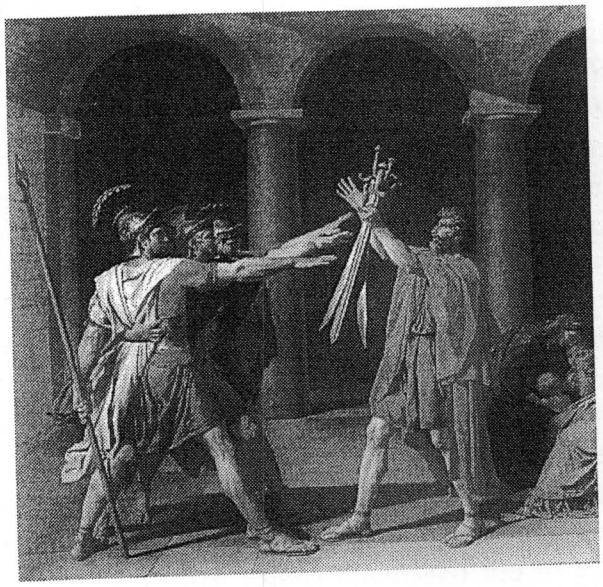
The publication of *The Analysis of Beauty* (1753) by British painter William Hogarth (1697-1764) served as another timely critique on the definition of beauty. Referring to the absurd schemes of classical painters, Hogarth advocated "a beauty of composed intricacy of form which leads the eye in a wanton kind of chase [since] the pleasure this gives the mind, entitles it to the name of beautiful" (Frayling and Van der Meer, 1992: "Proportion", n. pag.). Irish philosopher Edmund Burke (1729-1797) added to the aesthetic debate in *The Sublime and Beautiful* (1757) when he wrote that "beauty demands no assistance of our reasoning" (*ibid.*). He furthermore maintained that proportion "is an approbation, the antiquiescence of the understanding, but not of love, nor of any passion" (*ibid.*). Burke argued that visual gratification was neither a cultivated experience, nor did it depend on the application of proportion. His reaction was aimed [illegible]



4.1 Romanticism: Eugène Delacroix (1798-1863), *The Death of Sardanapalus* (1827).



4.2 Pre-Raphaelite: Dante Rossetti (1828-1882), *The Day Dream* (1880).



4.3 Neo-Classicism: Jacques-Louis David (1748-1826),
The Oath of the Horatii (1785).

compositional determinant than at its rigid implementation, which he claimed stifled creativity and individuality.

However, the most comprehensive aesthetic analysis dating from the Enlightenment was that of German philosopher Immanuel Kant (1724-1804). In his *The Critique of Judgement* (1790), Kant provided extensive theories on the faculties of perception and even acknowledged the role of intuition. Like Hume, Kant recognized the limitations of the intellect when making ethical and, consequently, aesthetic value judgements, stating that "The beautiful must be a finality apart from any end" (Thilly, 1993: 96). Kant's views on aesthetics were in due course furthered by his fellow countrymen, Johann Wolfgang von Goethe (1749-1832) and Georg Wilhelm Friedrich Hegel (1770-1831).

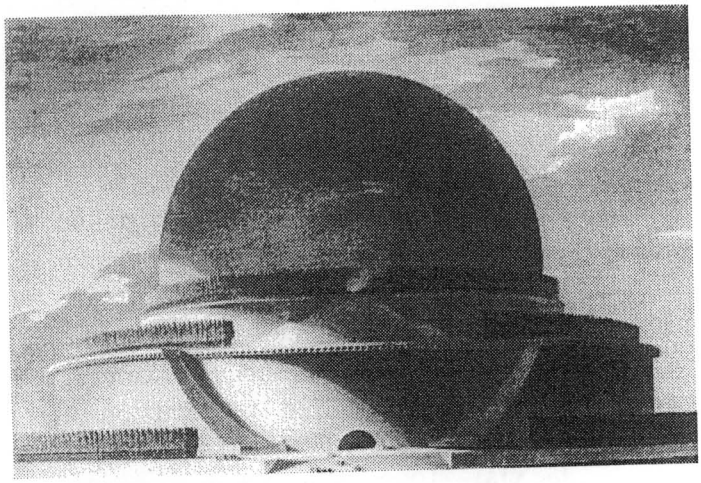
Thus, the Enlightenment signalled a first – albeit somewhat tentative – stab at the *status quo* of classical aesthetic principles. These criticisms were shared by numerous artists who considered the practice of art as restricting and creatively inhibiting – sentiments that spawned the romantic movement that predominated in England and France from 1780 until the mid-19th century. With rare exceptions, the Romantics were not concerned with matters of actuality. Instead, they sought thematic alternatives to the stoic heroism promoted by their neo-classical opponents. The Romantics were by and large self-indulgent and escapists, concerned with promoting individualism, and the depiction of the particular and the unique. As English painter and poet William Blake (1757-1827) evidently observed: "Genius begins when Rules end" (Frayling and Van der Meer, 1992: "Key Definitions", 43). It is noteworthy that the first recorded distinction between genius (being endowed with 'special gifts') and mere draftmanship, dates from that particular period. The Romantics either glorified the pastoral and undefiled nature, or sought escape from the hardships resulting from the Industrial Revolution in the portrayal of the exotic and sentimental nostalgia (*fig. 4.1*).

The secretive artistic brotherhood and derivative of Romanticism known as the Pre-Raphaelites was founded in England in 1848 (lasting until 1882) in deference to the simplicity and piety of the Middle Ages. The work of the Pre-Raphaelites was characterized by a combination of painstaking realism and a moral symbolism that drew heavily on the medieval past (*fig. 4.2*). Their ethical views promulgated in defiance of industrialization were in time shared by English moralist John Ruskin (1819-1900) and Arts and Crafts designer William Morris (1834-1896). [5]

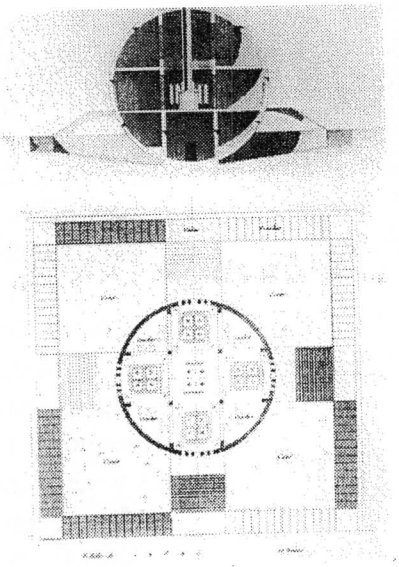
However, despite these countering painterly initiatives, the classical aesthetic ideal was resoundingly reaffirmed during the 18th century. In contrast with the degenerative interpretation of the classical idiom during the Baroque and Rococo periods, the so-called Neo-Classicists called for a scholarly return to the sobriety and moral high ground associated with Graeco-Roman antiquity. This was given further impetus by the archeological discovery of Pompeii in 1748. The protagonists of Neo-Classicism asserted that the classical ideal of beauty, according to Platonic definition, was the only legitimate means of restoring and retaining the dignity of the arts and, moreover, that its theoretical premises coincided with the pervasive rationalist philosophy which enjoyed wide assent. Consequently, the glorification of ancient subject matter – illustrating concepts such as valour, dignity, honour and patriotism – was employed for propagandist purposes purposes and to convey new political convictions (*fig. 4.3*). The president of the British Royal Art Academy Josua Reynolds (1723-1792) argued in his *15 Discourses* (n.d.) that the ethical improvement of society was only possible by painting the noble and the sublime (Beckett, 1994: 244). Despite opposing viewpoints, art academies continued to structure syllabi according to customary scholarly conventions, perpetuating the classical aesthetic ideal into the late 19th century and even beyond.

---

5 See Wilhide, E., 1991; 1994, *William Morris – Decor and Design* (London: Pavilion).



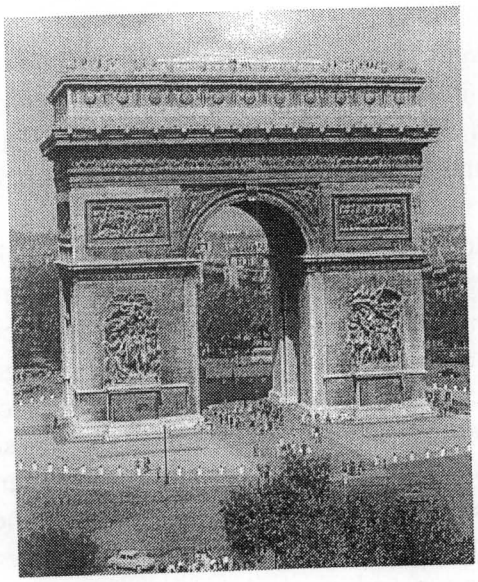
4.4 Visionary architecture: Ettienne-Louis Boullée (1728-1799), Newton Cenotaph, project (1784).



4.5 Visionary architecture: Claude-Nicolas Ledo (1736-1806), Shelter for the Rural Guards, project (c.



4.6 Eclectic Neo-Gothicism: Johan Nash (1752-1835), Brighton Pavilion, Sussex (1815).



4.7 Neo Classicism: J.F. Palgrin (q.v.), Arc de Triomphe de l'Etoile (1836).

4.5 STYLISTIC DISSENT

The aesthetic duality that prevailed in the visual arts was as pronounced in the architectural arena and ignited a stylistic dissension that lasted until the beginning of the 20th century. It is not surprising that the first recorded architectural polemic to challenge the catechisms of Classicism concurred with the genesis of the Enlightenment. Moreover, the theoretical preoccupation with design antecedents and formal archetypes during the 18th century was indicative of an architectural introspection yielded by techno-scientific advances and radically altered socio-political circumstances. The subsequent review and ultimate purification of the classical design idiom – manifested in the plethora of antique revival styles – was partly an architectural interpretation of rationalist philosophy, and partly a response to the volatile political climate that had equated the opulence of Rococo with the decadence of the *Ancien Régime*.

Concurring with the visual arts, romantic sentiments spawned, on the one hand, the generation of visionary architects (*figs 4.4-4.5*) and, on the other hand, the reappraisal of Gothicism after centuries of neglect. The Gothic Revival was not only dominant in the United Kingdom where the impact of the Industrial Revolution was most evident, but also in Northern European countries that were coming of age.

Die-hard supporters of Classicism continued to dismiss Gothicism as frivolous and emotive. They were adamant that because of the supposedly cosmological origins of Classicism, its aesthetic principles remained universally applicable – irrespective of programme, time or place. By contrast, it was exactly the spiritual properties of Gothicism that appealed to romantic and reformist sensibilities, since Classicism was, after all, of pagan origin. As Gothicism was intrinsically a Northern European phenomenon, it embodied the nationalist pride that swept through those countries at the time. Viollet-le-Duc's declaration that Gothicism epitomized rational design decision-making was an additional challenge to classical preconceptions. All these mentioned factors contributed to the stylistic rivalry that continued to haunt the quest for an architectural appropriation that would meet contemporaneous techno-scientific demands and corresponding societal expectations. The industrial *Zeitgeist* fell short of any form of ethical reconciliation and amplified instead the prevailing stylistic dilemma (*figs 4.6-4.7*). The creative impetus engendered by a new means of aesthetic expression could not have been more timely.

4.6 THE ADVENT OF PHOTOGRAPHY

The mammoth influence of the advent of photography (from the early 1820s but commercially available from 1851 [6]) on the reappraisal of art not only radically transformed the aesthetic debate, but rendered irrelevant the mentioned stylistic disputes. Although preceded by the camera obscura, the concept of permanently capturing the momentarily was only actively investigated from the beginning of the 19th century. Despite the fact that the first photographs were reproduced in black and white, it was merely a matter of time before colour was introduced. Research commenced in 1873 and colour photography became commercially available in 1906.

It is obvious that photography, as the most concrete evidence of visual observation, would have impacted so profoundly on the visual arts, since both the merit and the credibility of Western art had for centuries been defined in terms of mimetic reproduction and optical accuracy. Dunning (1991: 119) notes:

---

6 The claim of the authorship of photography is contentious. According to the *New Encyclopædia Brittanica* (1985 ed.: "Photography", vol. 25), the Frenchman Joseph Niepce is said to have produced the first photographic image in 1822. He, together with another Frenchman, one L. J. M. Daguerre, refined the process and made it public in 1839, whereupon an Englishman, W. H. F. Talbot, claimed that he had produced the first photograph. However, Talbot's experimentations were conducted only from 1834.

> "The Renaissance system of illusion [perspective] convinced an entire civilization that it possessed an infallible method of representation, a system for the automatic and mechanical production of truths about the material and the mental worlds." [Emphasis added by author.]

Never before, even during the iconoclast movement, had the essence of art been threatened to this extent. Neither had the validity of art, nor the legitimacy of its pursuit previously been questioned, let alone been jeopardized. Evidently, French romantic painter Paul Delaroche remarked in response to the advent of photography: "From today painting is dead" (Copplestone, 1985: 15).

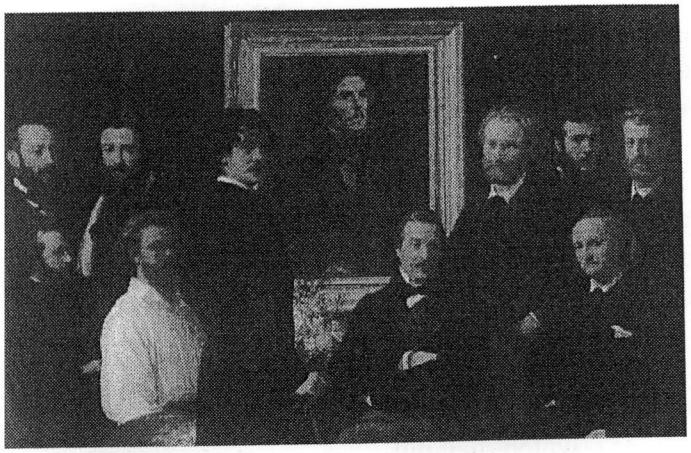
The artists of the mid-19th century had only two options: they could either adopt a defeatist attitude and render the pursuit of art obsolete, or they could use the opportunity to liberate themselves from the constraints of classical aesthetic doctrines and impositions – which they did.

Various art historians have been encountered who do not share this author's enthusiasm for photography as the pivotal influence on the genesis of modern art. By way of example, the *Larousse Encyclopedia of Modern Art* (1967 ed.: 150-154) mentions photography only in passing, and ascribes instead the radical artistic metamorphosis to the discovery of new sources of energy and speed. Art historian Kirk Varnedoe (1990: 29-53) acknowledges the important role of photography, but regards, rather unconvincingly, human initiative as the primary incentive for the sudden bouts of creativity. Herchell Chipp (1968: 7), in turn, reviews the development of modern art in the light of its socio-political milieu. Varnedoe (1990: 15) is particularly sceptical of this so-called contextual approach since he maintains that a political bias often distracts from the unadulterated creative impulse.

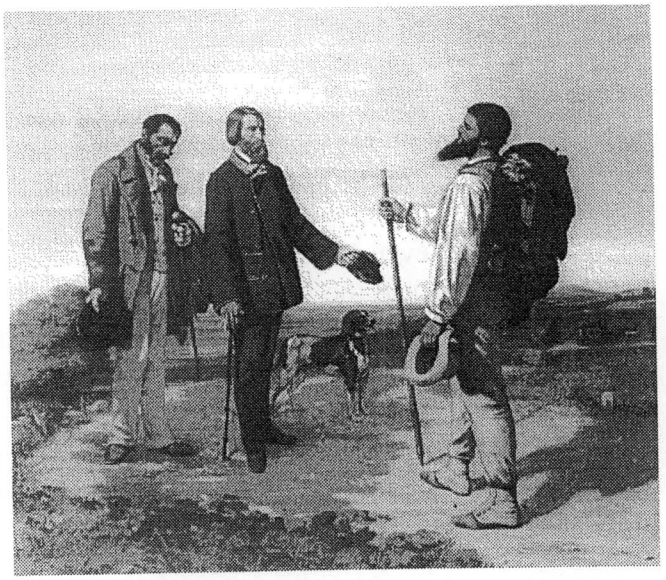
The question that remains is whether 19th century artists would have initiated the revolutionary route of artistic exploration had it not been for the advent of photography. This author maintains that it is highly unlikely even though the notion of democratic freedom associated with the Enlightenment mindset may have given rise to a greater degree of open-ended artistic portrayal and subjective interpretation. However, this did not occur until after the advent of photography. Another question worth asking is whether the Industrial Revolution was the actual cause of the advent of photography. Could it not have been invented, say, during the Renaissance, and if it had been, would it have altered aesthetic perception to the extent that it did? The answer to this question is more obscure as the enquiring mind has persisted for millenia and the changes brought about by the combination of certain chemicals have intrigued scientists for centuries. Unless the chemical compounds necessary for the photographic process only materialized during the 19th century – which was not the case – then the advent of photography remains a coincidence in the evolution of mankind and was therefore not a consequence of the Industrial Revolution *per se*.

What cannot be denied is that the art produced in less than two decades after the first public showing of photographs at the Crystal Palace, London, in 1851, was unlike anything ever encountered before. It was the first time in the history of the visual arts that Western artists questioned the necessity of painting, the role of art and the legitimacy of naturalistic depiction. It was also the first time that Western artists actively investigated alternative means of artistic portrayal. The sudden interest in the creative pursuits of non-Western cultures with their refreshing disregard for life-like representation, serves as the most convincing case in point. Consequently, photography can rightfully be regarded as the primary incentive for the liberation of the visual arts from antiquated aesthetic dogma.

In the course of events, the fine artists were the first to discard classical aesthetic aspirations and to introduce a radical pictorial inventory of tremendous intellectual, emotional, psychological and, ultimately, plastic implication.



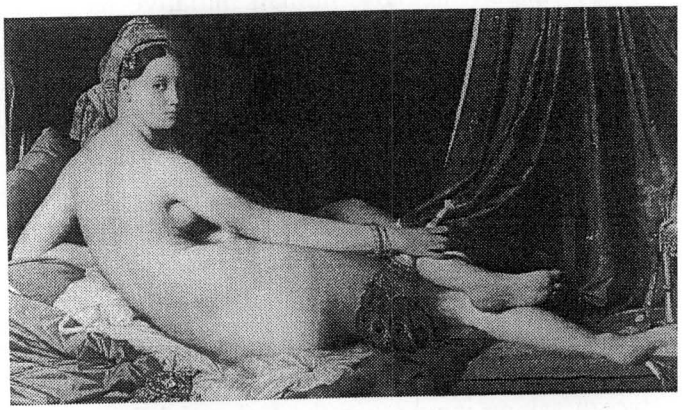
4.8 Henri Fantin-Latour (1836-1904), *Hommage à Delacroix* (1864).



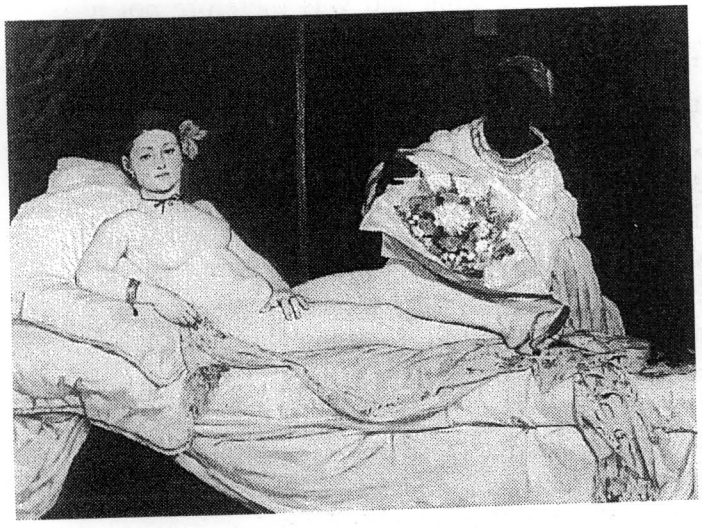
4.9 Courbet, *Bonjour Monsieur Courbet* (1854).



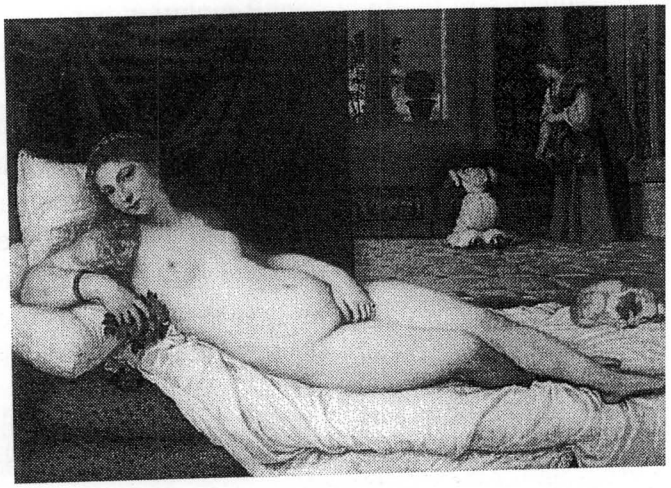
4.10 Manet, *Le Déjeuner sur l'Herbe* (1863).



4.11 Ingres, *La Grande Odaslique* (1814).



4.12 Manet, *Olympia* (1863/5).



4.13 Titian, *Venus of Urbino* (1538).

The resultant artistic experimentations ignited a visual revolution of such magnitude that Western aesthetic perception and appreciation were completely transformed. The creative momentum set in motion a sequence of artistic events which Varnedoe (1990: 16) aptly refers to as the "aesthetic logic" of modern art.

4.7 THE AESTHETIC LOGIC OF MODERN ART

Apart from the advent of photography, the second half of the 19th century was an extraordinary fertile – albeit volatile – era due to the immense concentration of intellectual energy. The communist manifesto *Das Kapital* by Karl Marx (1818-1883) was published in 1848; the "Great Exhibition" of 1851 hosted at the magnificent Crystal Palace celebrated man's techno-scientific achievements; Charles Darwin (1809-1892) challenged the origin of Man; Friedrich Wilhelm Nietzsche (1844-1900) pronounced God dead; Sigmund Freud (1856-1939) introduced a new understanding of human behaviour; and Wilhelm Roentgen (1845-1923) discovered X-rays in 1895. The advent of dynamite by Alfred Nobel (1833-1896) – somewhat earlier in 1867 – added additional explosiveness to a relatively precarious existence in which neither the political oligarchy, nor its subjects, was entirely certain of what an industrialized future may hold. Barbara Tuchman (1966: 134) describes the restlessness of the mid-19th century as follows:

> "Industrialization, imperialism, the growth of cities, the decline of the countryside, the power of money and the power of machines, the clenched fist of the working class, the red flag of Socialism, the wane of the aristocracy, all these forces and factors were churning like bowels of a volcano about to erupt."

Despite the statement made by French poet Charles Baudelaire (1821-1867) in "The Painter of Modern Life" (n.d.) that "the duty of the artist would be to express that beauty which is intrinsic to our new emotions" (Russell, 1991: 15), the art produced during the first decade of the mid-19th century remained remote from reality. Artists either sought escape in romantic flights of fantasy or were seemingly oblivious of the dramatic changes in society. Art academies, in particular, continued, even into the early 20th century, to encourage and reward those artists that complied with traditional aesthetic conventions (*fig. 4. 8*). [7]

Although preceded by French artist Gustave Courbet (1819-1877) with his paintings of commonplace occurrences (*fig. 4.9*), it was ultimately his contemporary, Édouard Manet (1832-1883), [8] who initiated the liberation of Western art from its traditional allegorical position with his supposedly scandalous paintings, *Le Déjeuner sur l'Herbe* (1863, *fig. 4.10*) and *Olympia* (1863/5, *fig. 4.12*).

Manet's depiction of the female nude – modelled after Jean-Auguste Ingres (1780-1897, *fig. 4.11*) and Titian (Tiziano Vecellio, c. 1488-1567, *fig. 4.13*) – in a contemporaneous context gave the antiquated subject matter a modern sense of actuality. Although the painterly technique still conformed to scholarly conventions, Manet succeeded in making a dramatic statement regarding the outdated position that academic painting continued to assume despite radical societal transformations. Since female nudes had previously dominated as goddesses and muses, those depicted by Manet evoked a completely different reading. Manet not only reduced their status to mere mortals, but also drew

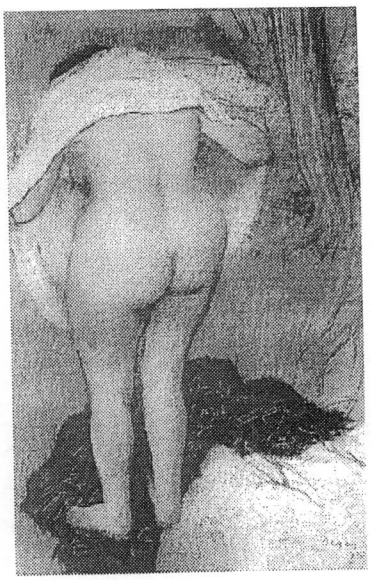
---

7 The history of modern art is fraught with instances where art academies and salons rejected experimental art, not to mention derogatory journalistic commentary and public demurrals. See Hughe, R. (ed.), 1967 ed., *Larousse Encyclopedia of Modern Art* (London: Hamlyn), 150-154, and Dunning, R., 1991, *Changing Images of Pictorial Space – A History of Spatial Illusion in Painting* (New York: Saracuse Univ. Press), 33-34.

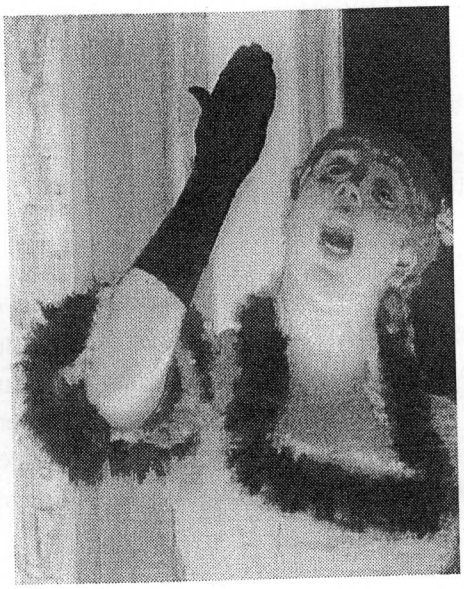
8 While most art historians identify Manet as the progenitor of modern art, some cite Courbet in this regard. Although Courbet's painting *Bonjour Monsieur Courbet* (1854) serves as the first example of the defiance of academically-approved subject matter, Manet's *Le Déjeuner sur l'Herbe*, painted some nine years later, was the more challenging and thought-provoking.



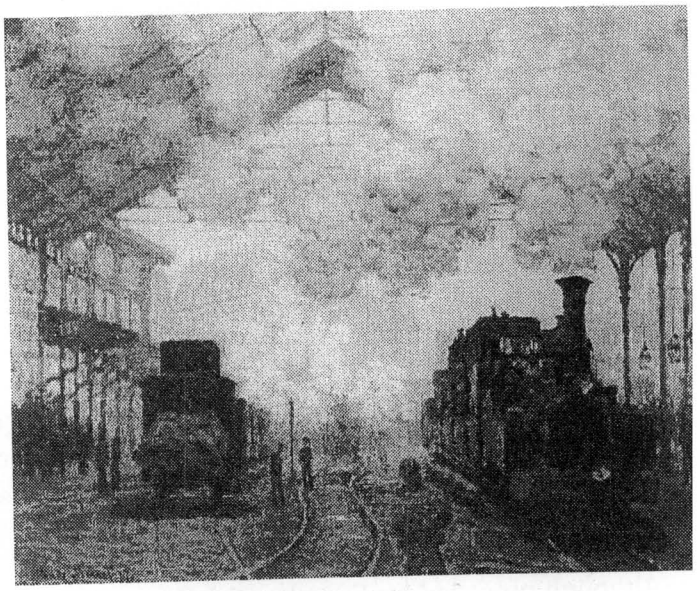
4.14 Renoir, *The Boating Party Lunch* (1881).



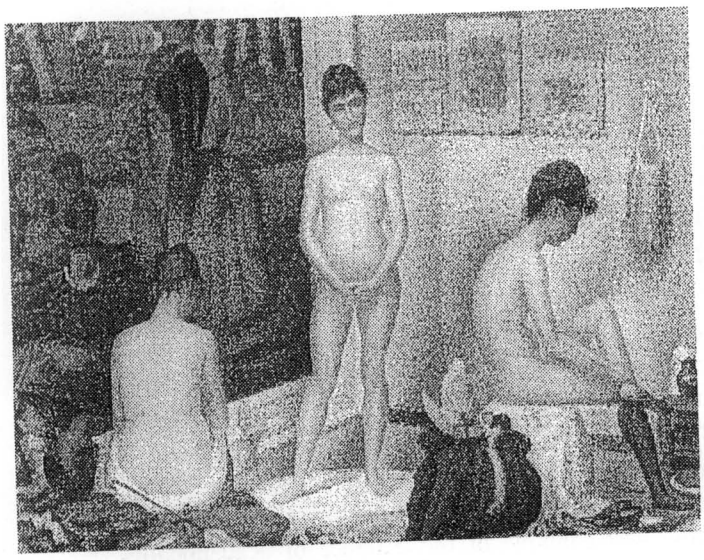
4.15 Degas, *Girl Drying Herself* (1885).



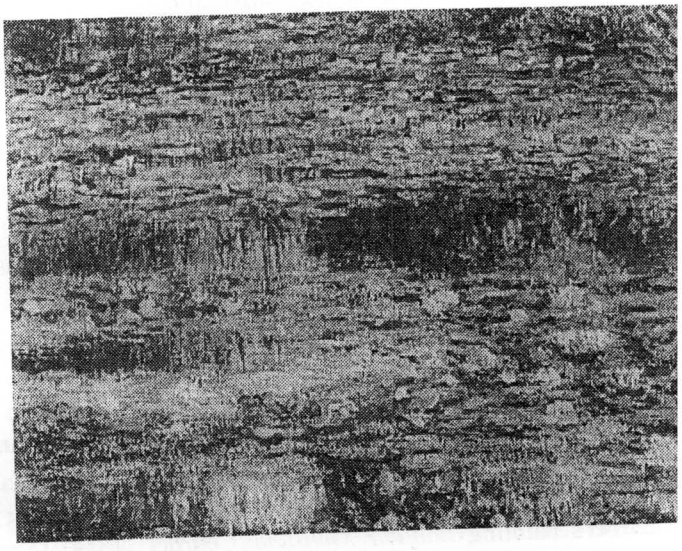
4.16 Degas, *Café Singer Wearing a Glove* (1878).



4.17 Monet, *Gare Saint-Lazare* (1877).



4.18 Seurat, *Les Poseuses* (1888).



4.19 Monet, *The Waterlily Pond* (1899).

attention to the changing circumstances, calling implicitly for a review of the traditional role that art had for so long assumed. The public outrage (Dunning, 1991:33) caused by these two paintings confirmed Manet's pioneering role in extending the role of art beyond the superficiality of narrative depiction. (Dunning [*ibid.*] draws attention to how people react when they first experience a powerful new image, which, in hindsight, may not seem so potent to a visually conditioned audience.)

Incidentally, this method of superimposition – whereby the cliché is portrayed in a totally unrelated context and consequently evokes a different interpretation – was furthered by Marcel Duchamp (1887-1968) during the 1910s and 1920s, and also by Andy Warhol (1928-1987) in the 1960s when it became the embodiment of Pop Art. From this particular point of view, Manet can be regarded as the predecessor of Post-Modernism, with his nudes just as pregnant with meaning as Duchamp's urinal or Warhol's soup cans.

It was the courageous step taken by Manet in acknowledging that the role of art had to be expanded from being depictive and representational to being communicative and intellectually challenging that heralded him the progenitor of modern art. Moreover, Manet had indicated that art, instead of being an idealized rendition according to Platonic doctrines, should reflect and respond to the prevailing *Zeitgeist*. (One can of course suggest that Manet's decision to superimpose a nude from antiquity on the present was a deliberate attempt at defying photography since the latter can only capture the momentary. Trevor Copplestone [1985: 16], however, contends that the painterly experiments conducted by the Impressionists, Neo-Impressionists and Post-Impressionists were far more calculated responses to the advent of photography than in Manet's case.)

Manet's example had a significant influence on the younger generation of French artists, most notably Claude Monet (1840-1926), Auguste Renoir (1841-1919), Edgar Degas (1834-1917), Alfred Sisley (1838-1899), Camille Pissarro (1830-1903) and Berthe Morisot (1841-1895), who formed the nucleus of the so-called Impressionists. [9] Instead of portraying old themes in new surroundings, latter-day subject matter, such as industrial phenomena and contemporary existence, featured prominently (*figs. 4.14-4.17*). Copplestone (*ibid.*: 19) notes:

> "... the Impressionists abandoned grand Classicism, historical and intellectual subject matter in favour of the commonplace and familiar: everyday scenes and objects ... They made no intellectual comment nor philosophical analysis; they merely observed – acutely the scene they had chosen."

As they renounced musty studio environments to paint *en plein air*, the Impressionists and the concurrent *Neo*-Impressionists [10] – pioneered by Georges-Pierre Seurat (1859-1891) – became fascinated with the diverse possibilities presented by nature; consciously perhaps, developing painterly techniques to record visual experiences in a way that the camera cannot. Seurat played a seminal role in this regard with his quasi-scientific studies of the optical effects resulting from iridescent colour combinations (*fig. 4.18*). The startling effects produced by the novel painterly technique, known as "pointillism", alluded to the fact that pictorial depth could be achieved exclusively through the use of colour.

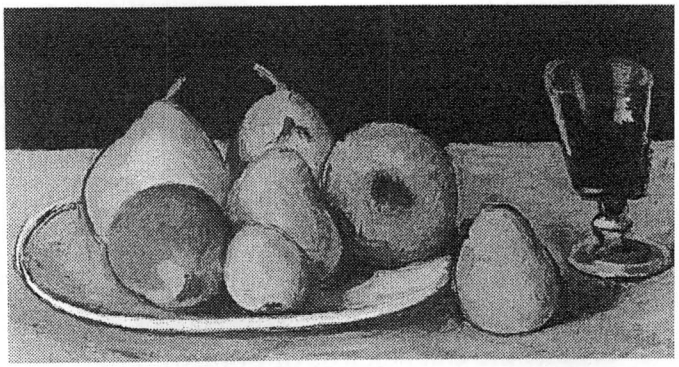
---

9 The term "Impressionism" was derived from a sarcastic comment made by a French journalist, Louis Leroy, about *Impression: Sunrise* (1872) by Monet, on display at the Salon de Refusés in Paris in 1874. As the term accurately described the artist's intention to capture the momentary, it gained common currency.

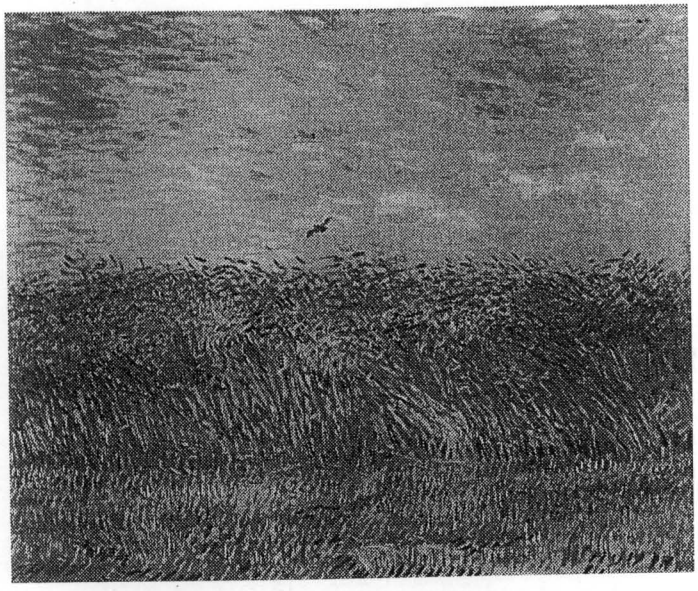
10 Art historians make an academic distinction between the intuitive pictorial experiments of the Impressionists and the more scientifically-orientated colour investigations conducted by the Neo-Impressionists, pioneered by Seurat. From the outset, Seurat referred to his particular pursuits as "optical painting" – later known as "pointillism" or "divisionism". Refer to the Glossary for further clarification of these painterly terms and techniques.



4.20 Cézanne, *Woods with Boulders* (1898).



4.21 Cézanne, *Glass and Pears* (1882).



4.22 Van Gogh, *Wheat Field with a Lark* (1887).



4.23 Van Gogh, *Self-Portrait with Pipe and Bandaged Ear* (1889).



4.24 Gauguin, *I hail Thee, Mary* (1891).



4.25 Gauguin, *Tahitian Women with Mango Blossoms* (1899).

In the process, and in stark contrast with all previous painterly pursuits, the subject matter – whether natural or man-made – was increasingly regarded as subordinate to the sensations of light and colour. Monet's exquisite studies of colour impressions (*fig. 4.19*) warranted the comment by Paul Cézanne (1839-1906) that "Monet is only an eye, but what an eye!" (Copplestone, 1985: 21) Although the Impressionists' and Neo-Impressionists' preoccupation with colour partly served to counter photography's temporary inability to provide colour reproductions, subsequent artists were alerted to the autonomous role that the rudimentary principles of art could assume.

The conceptual potential of Impressionist painting unleashed an unrivalled creative output. Even though there exists, as Vandedoe maintains, an uncanny aesthetic logic that underlies the sequential development of modern art, the extent to which individual artists contributed to this evolutionary process has to be acknowledged. It was the first time in the history of Western art that different artists imbued the artistic arena with their respective interests and temperaments but, above all, their personal creative instincts. These factors contributed to the highly individualistic and experimental nature of modern art – unique by comparison to any other artistic epoch. The different avenues of exploration pursued by the so-called Post-Impressionists, [11] most notably, Cézanne, Vincent van Gogh (1853-1890) and Paul Gauguin (1848-1903), bear testimony to the diversity of subjective approach.

The Post-Impressionists had no common aim apart from extending the artistic repertoire beyond its customary role. In due course, the defiance of photography became less of a concern than the abundant creative possibilities latent in the work of the Impressionists. According to Copplestone (*ibid.*: 25):

> "For the leading figures among the Post-Impressionists, it was partly the deficiencies they discerned in Impressionism that governed their development. The gravest of these deficiencies, in their eyes, was the absence of any emotional statement to match the visual discovery – a 'bourgeois' lack of commitment."

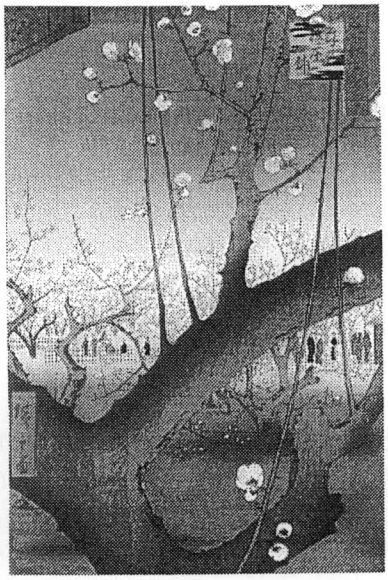
In identifying these alleged deficiencies, Cézanne amplified the formal aspects of the object, whereas Van Gogh and Gauguin were more concerned with the emotive and spiritual content of their subject matter. Cézanne continued to return to nature, which he considered the most authentic artistic precedent (*figs 4.20-4.21*). [12] Van Gogh emphasized the emotional properties of both the human condition and nature through an unprecedented use of colour and tactile intensification (*figs 4.22-4.23*). Gauguin, on the other hand, defied all academic conventions in search of artistic inspiration beyond the immediate. As a self-taught artist, Gauguin could give full reign to his creative impulses, exploring both the unselfconscious and the subconscious, whereupon imagination – instead of imitation – was introduced as a fundamental source of artistic inspiration (*figs 4.24-4.25*).

The artistic exploits of the Post-Impressionists were furthered by the Fauves (1904-1907), the Expressionists (1905-1914), the Futurists (1909-1916), the Dadaists (1916-1922), the Surrealists (1922-1938) and, inevitably, the Cubists (1907-1925). Cubism, in turn, acted as the primary creative

---

11 The term "Post-Impressionism" was coined by English art critic Roger Fry (1866-1934) to denote the paintings he had selected for an exhibition, hosted at the Grafton Gallery in London in 1910/1, which demonstrated a distinct departure from the impressionist genre. In addition to work by Cézanne, Van Gogh, Gauguin and Seurat, Picasso and Henri Matisse (1869-1954) were also represented. The diversity in approach identified a period of artistic activity rather than a common aesthetic goal. It was only after Matisse and Picasso had pursued more specific avenues of artistic exploration, that a more finite academic distinction was made between Impressionism, Neo-Impressionism, Post-Impressionism, Fauvism, Cubism, and so forth. It is now generally accepted that Cézanne, Gauguin and Van Gogh were the major proponents of Post-Impressionism.

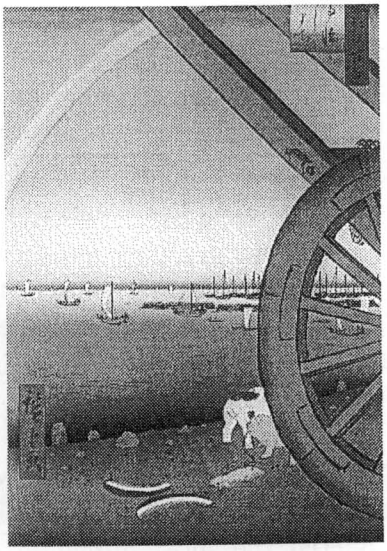
12 See Chipp, H. (ed.), 1968, *Theories of Modern Art* (Los Angeles: Univ. of California Press), 16-23, for selected excerpts from letters written by Cézanne in which he refers incessantly to nature as the primary source of artistic inspiration.



4.26 Japanese wood-block print: Ando Hiroshigo (q.v.), *Plum Estate, Kameido* (1857).



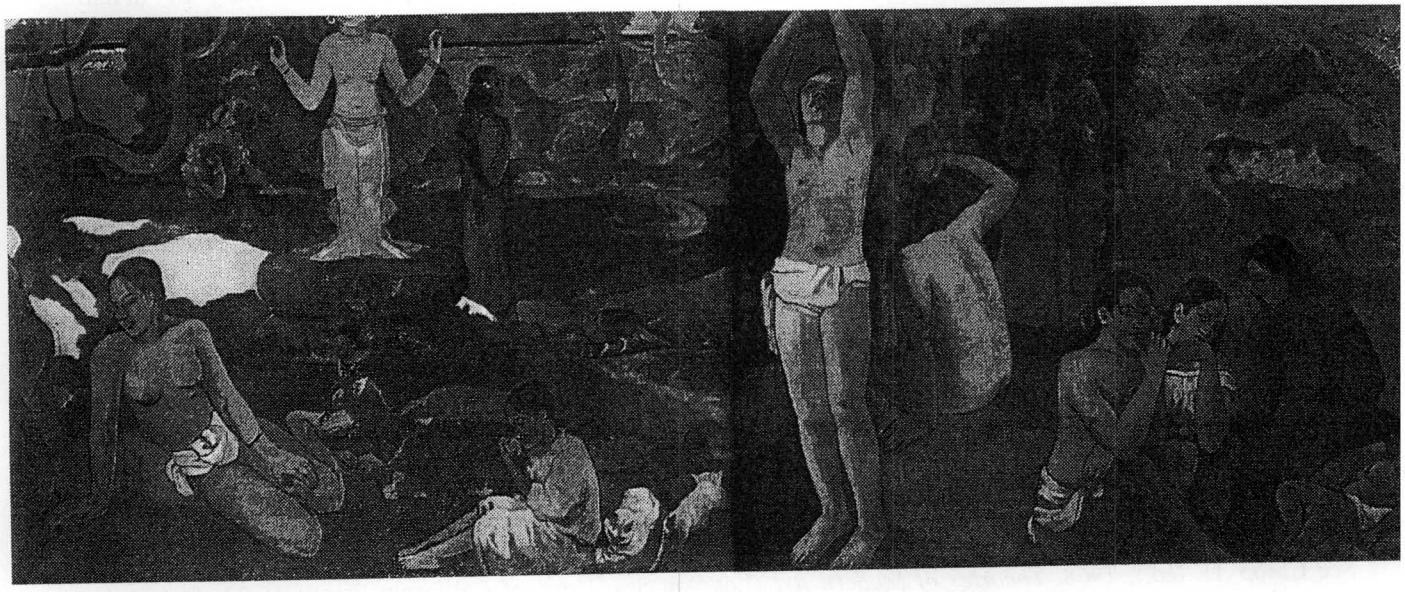
4.27 Van Gogh, *Japonaiserie: The Tree* (1887)



4.28 Japanese wood-block print: Hiroshigo, *Ushimachi, Takanawa* (1857).



4.29 Degas, *Racecourse, Amateur Jockeys* (188



4.30 Gauguin, *Where Do We Come From? What Are We? Where Are We Going?* (1897).

incentive for every other art movement (including some of the aforegoing) that emerged during the 20th century. However, all the mentioned and subsequent aesthetic initiatives were indebted to Manet and the Impressionists for having extended the artistic narrative way beyond mere imitation.

4.8 TOWARDS THE REAPPRAISAL OF ART

Whereas classical aesthetic convictions were based on faith in the veracity of the senses, modern artists modelled their visual intentions on different insights and new experiences, compounded by the advent of photography. The increasing acknowledgement of the painterly surface as a two- dimensional entity was one of the most fundamental aspects of modern art, steadily paving the way towards the self-conscious reversal to the aspectival mode of artistic expression. In the words of Copplestone (1985: 47):

> "From the Impressionists forward, consciousness of the picture as a surface had been growing. As distortion of forms became increasingly insistent the possibility of viewing the work as a spatial reflection of the visual experience was diminished. At the same time, the surface treatment also became steadily more insistent."

A number of specific sources are cited to have induced the supposed road to flatness, as referred to by Varnedoe (1990: 25). These include Japanese wood-block prints, and ceremonial artefacts from the South Sea Islands and Africa. Although it seems coincidental that these objects only came into general circulation in Europe during the second half of the 19th century, [13] it is doubtful whether they would have captured the attention of Western artists to the same extent at any other point in time.

The pictorial organization of the Japanese, with their intriguing dramatization of the foreground to create a sense of depth, was pursued most rigorously by Degas [14] and Van Gogh (*figs 4.26-4.29*). In turn, the exotic – a remnant of the romantic period – fascinated Gauguin to such an extent that he traded 'civilization' for Tahiti, as much in search of himself as the meaning of art. Gauguin fused exotic subject matter with oriental compositional procedures and gradually sacrificed pictorial depth in favour of symbolical content (*fig. 4.30*). Gauguin's interests were in due course furthered by the Fauves and Cubists, whereupon African artefacts captured the attention and received wide acclaim.

The elicited enthusiasm stemmed from the cues that the unself-conscious provided contemporary aesthetic theory. Since so-called primitive art was totally uncontaminated by any preordained aesthetic doctrines – whether Platonic or religious – it represented the most rudimentary example of creative expression. The classic aesthetic – the epitome of the self-conscious tradition – was founded on the premise of recreating the sensory through illusionary optical conventions, predominantly perspective. With all that thrown in jeopardy by the advent of photography, 19th century artists considered the

---

13 Laude, J., 1971; 1973, *The Arts of Black Africa*, trans. Dedock, J. (Los Angeles: Univ. of California Press), 3-6, notes that the first mention of African artefacts in Europe dates from 1470. These became sought-after collectables until the end of the 17th century, whereupon interest waned. However, Laude maintains that most of the items collected for so-called curiosity rooms of the nobility were commissioned – predominantly by Portuguese traders – and were excecuted in accordance with European instructions, even conventions. Examples of authentic traditional art were rare and considerable less popular. According to Laude (*ibid.*: 4), "Traditional art was far more scarce, since the sacred qualities attributed to such pieces by indigenous people made them difficult to purchase. The wooden figures of native art were fragile; their bizarre appearance might also have discouraged collectors or their heirs who would eventually dispose of them. Many must have been lost in the Lisbon earthquake of 1755. Only a few works not inspired by Europe remain..."

14 Varnedoe, K., 1990, *A Fine Disregard – What Makes Modern Art Modern?* (London: Thames & Hudson), 42-53, refers also to how "faulty" photographs with cropped images influenced the painterly compositions of Degas.

origin of the creative impulse as the principal starting point for the review and ultimate reappraisal of art. (This was not dissimilar to the 18th century quest to review the theoretical premises of architecture via formal archetypes.)

In due course, the sensory and the manner of its representation, became less of a concern than the notion of art *per se*. The catch-phrases "to return to point zero" and *tabula rasa*, frequently used by art theorists early in the 20th century, embodied the yearning to return to 'the beginning' and to reappraise the essence of art. Primitive artists, oblivious of perspective and indifferent to life-like representation, indicated that neither the pursuit of art, nor the merit of art, has to rely on, or be defined in terms of, optical accuracy. Via the example of primitive art, coupled with the pioneering initiatives of Manet and the Impressionists, the Cubists could systematically evolve a series of 'retrogressive' steps towards a completely new means of artistic expression, perception and appreciation.

4.9 SUMMARY

Whilst acknowledging the catalytic role of the Industrial Revolution on the appropriation of a contemporaneous architectural idiom, it has been argued that the advent of photography was the principal cause for the ultimate rejection of the classical aesthetic.

Cognizance has been taken of the Enlightenment mindset, which, induced as a result of the Newtonian paradigm, culminated in the harnessing of mechanical power and the genesis of industrialization. Extensive techno-scientific application exercized an enormous influence on all spheres of human endeavour, with profound societal, political and moral ramifications. The prevailing criticality in the socio-political arena permeated also aesthetic discourse, calling into question the *status quo* of Classicism. Notwithstanding, all countering architectural and artistic initiatives of the 18th and early 19th centuries still conformed to approved academic conventions or familiar design antecedents. In addition, the unprecedented design challenges and typological demands made on the architectural profession spawned a stylistic dissent that persisted until the beginning of the 20th century.

The advent of photography in 1822, but commercially available from 1851, rendered irrelevant all past aesthetic disputes. As the most concrete evidence of visual observation, photography countered the classical aesthetic aspiration for mimetic reproduction, challenging the validity of art and the legitimacy of its pursuit. Édouard Manet's pioneering example and the resultant impressionist movement extended artistic portrayal beyond narrative depiction, and ignited a visual revolution of tremendous proportions. The preoccupation with new modes of visual communication stimulated an interest in primitive art, which taught that the merit of art does not have to be defined in terms of optical accuracy. This cognition enabled Western fine artists to finally discard classical doctrines and scholarly conventions, and introduced completely new dimensions to the aesthetic disciplines of tremendous intellectual, conceptual and, ultimately, plastic implication.

CHAPTER 5 CUBISM

5.1 PREFACE

In view of the assertion that Cubism was the seminal influence on the codification of a modern architectural vocabulary, an in-depth review of this remarkable artistic phenomenon is deemed necessary.

This chapter traces the genesis of Cubism and examines the far-reaching conclusions drawn from the most important visual document of the 20th century, *Les Demoiselles d'Avignon*. It also reviews the evolutionary sequence of Cubism and its widespread assimilation.

5.2 INTRODUCTION

Given the aesthetic metamorphosis of the visual arts during the mid-19th century, it is perplexing that so few contemporary architectural historians acknowledge this persuasive influence on the intensification of an architectural appropriation – generally ascribed to factors extraneous to the radically new artistic genre.

Frampton (1980: 68) mentions, almost in passing, how 19th century art contributed to the emergence of Art Nouveau, particularly discernible in the designs of Belgian architect Victor Horta (1861-1947):

> "... the most influential image behind Horta's peculiar 'strapwork' style was the graphic work of the Dutch-Indonesian artist Jan Toroop. This connection underlies the importance of painting in the Belgian Art Nouveau. Toroop was a member of the influential Post-Impressionist group, Les XX, whose later re-formation as La Libre Esthetique was to play a key role in the dissemination of the aims and principles of the English Arts and Crafts movement."

In *Pioneers of the Modern Movement [Modern Design] from William Morris to Walter Gropius* (1936; 1960: 90), veteran architectural historian Nikolaus Pevsner provides a more comprehensive account of Toroop's impact on Art Nouveau, which he traces via the Pre-Rahaelites. Inevitably, the undulated, graphic quality of Toroop's designs was far more suitable for architectural interpretation than any efforts by the Impressionists or Post-Impressionists. Although beyond the scope of this study, this latter connection calls for investigation.

Notwithstanding, Art Nouveau and its various derivatives did succeed in discarding all vestiges of historicism and eclecticism. But, however novel, its highly decorative design idiom failed to provide a convincing semantic foundation for a contemporaneous architecture, and was consequently no more than a transitional phase. Yet, it can be no coincidence that Loos's slating critique of Art Nouveau, in addition to the formal simplification evident in his own architecture from 1910, coincided with the pictorial innovations that emerged during the period following the impressionist genre.

Even though the sentiments of Expressionism [1] – the German art movement that materialized concurrently with Cubism – were shared by many architects, the resultant poetic and complex

---

1 Expressionism – an amalgamation of Die Brücke (1905-1913) and Der Blaue Reiter (1910-1914) – is a problematic aesthetic movement since it never existed as a collective initiative. Neither did its artists have a particular agenda, other than pusuing the emotive propensities of art after the example of the Fauves, the Post-Impressionists and Norwegian painter Edvard Munch (1863-1944). The expressionist artists were profoundly influenced by Cubism during the early 1910s, hence the plausible correspondece between the work of its architectural component (albeit a retrospective association with Expressionism) and the cubist treatment of form. See Glossary for a more comprehesive reference to Expressionism.

formalism was not conducive to meeting contemporaneous demands. Rather, the crystalline geometries and transparent qualities of the architectural component of Expressionism – demonstrated in Taut's work, in particular – recall the faceted formal treatment of Cubism. Giedion (1941; 1967: 486) is of the opinion that "the expressionist influence could not perform any service for architecture". Cubism, on the other hand, by the very nature of its semantic denotation, encompassed a distinct tectonic quality that coincided with the persuasive rationalistic ethos advocated since the mid-17th century. Banham (1960a; 1996: 203) concurs:

> "This Cubist tradition was, itself, part of that larger and paradoxical tradition of being anti-traditional, that goes back, in painting, at least to Courbet, parallel with an innovating tradition in Rationalist architectural thought that goes back to Labrouste. Both traditions were regarded, with varying justification, as anti-Academic, but Cubism, more than any previous phase of the pictorial revolution, presented aspects that could be approximated to those of Rationalist architectural theory."

In addition, the infectious reductive methodology of Cubism, coupled with its inherent geometric propensity, provided architecture with a formal analogy and a design point of departure unbeknown in its historical development. Cubism also introduced a radically new aesthetic sensibility that called implicitly for a responding architectural equivalent – with Maison Cubiste designed by Duchamp-Villon in 1912, the first attempt in this regard. [2] More importantly, the cubist-induced space-time paradigm and implied sense of movement heralded incalculable consequences for the three-dimensional arts, and revoked all previous design premises and preoccupations. Never before had an autonomous art movement impacted so significantly on the emergence of new architectural idiom as did Cubism. Selim Khan-Magomedov (1987: 61) notes:

> "In the past, architecture had always been the determinant of stylistic change, but it lost this position during the nineteenth and early twentieth centuries. This leading role was then for many years taken over by painting, which established tastes in art and aesthetic standards."

In *Vers une Architecture* (1923; 1987: 19), albeit more than a decade after the genesis of Cubism, Le Corbusier still lamented:

> "Today, painting has outsped the other arts. It is the first to have attained attunement with the epoch ... Painters and sculptors, champions of the art of to-day, you who have to bear so much mockery and who suffer so much indifference, let us purge our houses, give your help that we may reconstruct our towns."

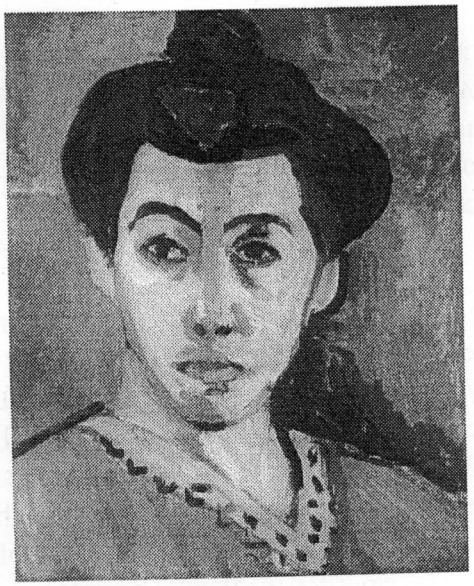
5.3 THE GENESIS OF CUBISM

Cubism [2] materialized with the proto-cubist painting *Les Demoiselles d'Avignon* (*fig. 5.17*) produced by Picasso in Paris from 1906 to 1907. Certain art historians maintain that the actual cubist idiom was only initiated one year later by his French counterpart, Georges Braque (1882-1963), but

---

2 According to Weston, R., 1996, *Modernism* (London: Phaidon), 70-71, one André Maré deployed a team of decorative artists to create a so-called Maison Cubiste as a setting for the paintings at the seminal Salon d'Automne Exhibition, hosted in Paris in 1912. However, only a model and full-size entrance façade were built according to Duchamp-Villon's design and consisted of no more than a faceted treatment of classical elements. More substantial cubist-inspired architecture emerged in Czechoslovakia during the following year – as will be referred to in Chapter 9.

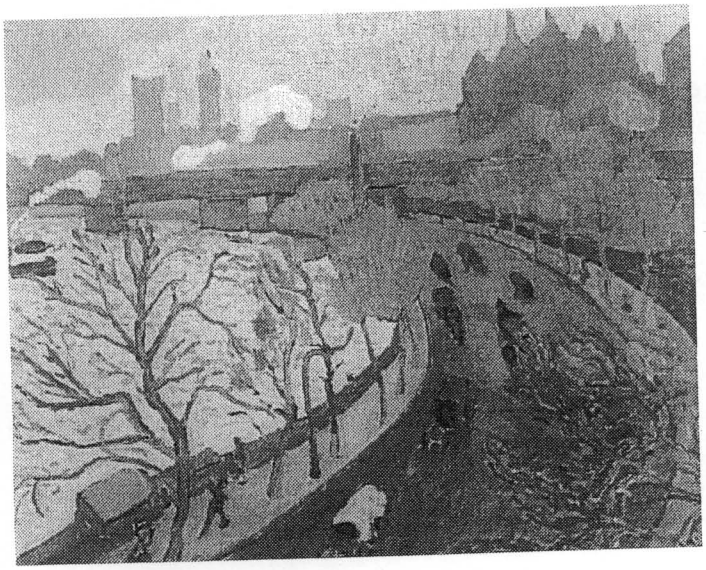
3 The origin of the term "Cubism" is controversial. Most sources cite Guillaume Apollinaire (1880-1918) as the first to have used the term. However, according to Apollinaire himself, as narrated in *Les Peintres Cubistes* (1913), it was Matisse who first spoke of cubes upon seeing Braque's paintings submitted to the Salon d'Automne in 1908. Fry, E. (ed.), 1966, *Cubism* (London: Thames & Hudson), 50, however, maintains that the art critic Louis Vauxcelles (1870-q.v.) coined the term six weeks later in a review on Braque's paintings at Chez Kahnweiler, published in the Parisian newspaper *Gil Blas* on 14 November 1908. Despite its controversial origins, the term had come into general use by 1911.



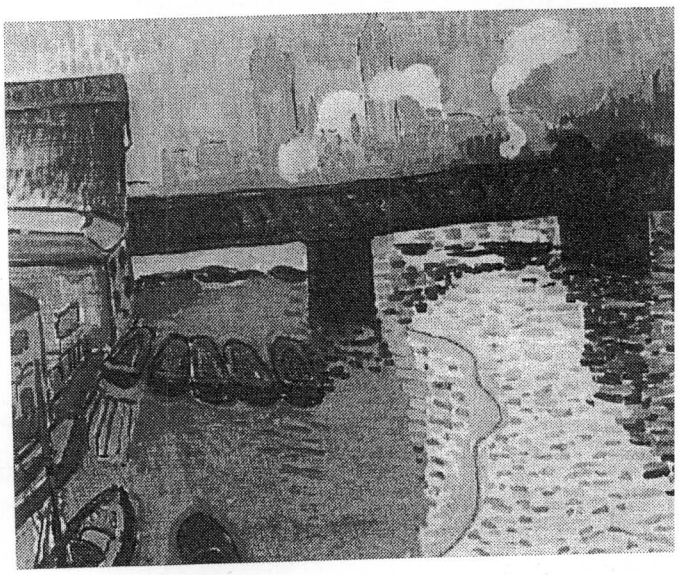
5.1 Fauvism: Matisse, *Portrait of Madame Matisse with a Green Stripe* (1905).



5.2 Fauvism: De Vlaminck, *The Blue House* (c. 1905).



5.3 Fauvism: Derain, *Pont de Charing Cross* (1906).



5.4 Fauvism: Derain, *Charing Cross Bridge* (1906

furthered, together with Picasso, until the outbreak of the First World War whereupon Braque left for military service. Although Cubism persisted into the late 1920s and even beyond, the inaugural period between 1907 and 1914 is considered the seminal years of this particular painterly phenomenon. During this time, Picasso and Braque worked together and in relative seclusion from others. Presumably, neither artist ever intended Cubism to become an international art movement, but they had acquired a considerable following by as early as 1911.

Contrary to the fashion of the time, Picasso and Braque never promulgated their artistic insights in manifesto format. Except for occasional published interviews, [4] both artists were reluctant to commit themselves to paper – Braque wrote occasionally, Picasso never. Notwithstanding, a plethora of literature on Cubism [5] continued to appear after the first public exhibition of Braque's work, hosted at Chez Kahnweiler, Paris, in November 1908. Picasso was particularly sceptical of elaborate theorizing and maintained that his work contained his ideas which required neither written clarification nor academic justification. In a published interview, entitled "Picasso Speaks" with Marius de Zayas (1923; 1966: 65), Picasso stating emphatically, "I hardly understand the word research in connection with modern painting". Art historians have to rely on anecdotal information and alleged eyewitness accounts from the authors most intimately connected with Picasso and Braque during the genesis of Cubism. These included French poet and adversary of modern art Guillaume Apollinaire (1880-1918), art critic André Salmon (1881-q.v.) and controversial American author Getrude Stein (1874-1946). Consequently, the dissemination of cubist intentions is extremely complex. Misleading and conflicting accounts have led to ambiguous interpretations that continue to haunt any contemporary study of Cubism.

5.4 MAJOR INFLUENCES

5.4.1 Fauvism

Fauvism pertains to the series of unorthodox paintings produced by an informal gathering of artists who regularly exhibited together in Paris between 1904 and 1907, earning them the derogatory name "the wild beasts", coined by French art critic Louis Vauxcelles (1870-q.v.) in 1905. [6] Art historians maintain that of all the 20th century movements, Fauvism is the least definable due to the diversity of artistic approach. Its major proponents included Henri Matisse (1869-1954), Maurice de Vlaminck (1876-1958), André Derain (1880-1954), Georges Rouault (1871-1958) and Raoul Dufy (1877-1953).

Fauvism was a personified synthesis of the work produced by the Post-Impressionists, but the mentioned artists soon extended the intensity of expression of Gauguin, Van Gogh and Cézanne. The Fauves relished in the newly found creative freedom, developed an exaggerated mode of drawing, distorted pictorial depth and used bold and non-representational colour schemes (*figs 5.1-5.4*). They were also interested in African art and avid collectors, but did not internalize its conceptual

---

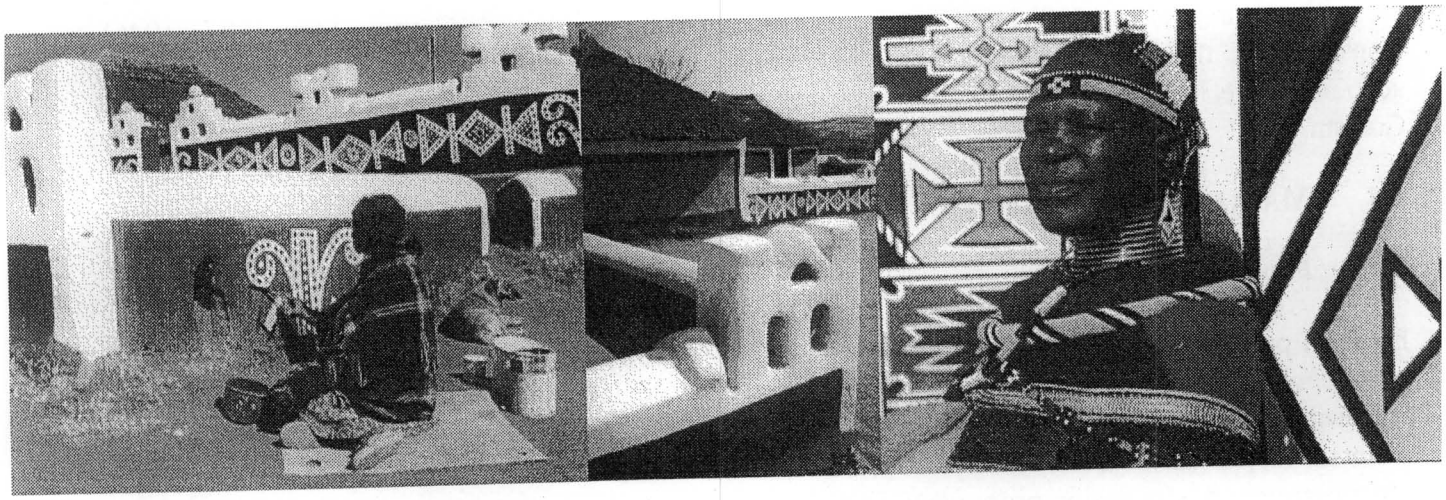
4 The earliest recorded statement by Braque appeared in Gelett Burgess' article "The Wild Men of Paris", *Architectural Record*, of May 1910. The most comprehensive record of Braque's views on his work appeared under the title "Pensées et Réflexions sur la Peinture", published in *Nord-Sud* in Dec. 1917.
"Picasso Speaks [Statement to Marius de Zayas]", *The Arts*, of May 1923, was Picasso's first published interview on Cubism. Chipp, H. (ed.), 1968, *Theories of Modern Art* (Los Angeles: Univ. of California Press), 198, mentions that although Picasso never wrote anything about his views on art, he did write poetry and even a play.

5 In addition to art reviews published in local newspapers and periodicals, the first book on the topic, *Du Cubisme*, was written by Metzinger and Gleizes and published in 1912, followed by Apollinaire's *Les Peintres Cubistes* of 1913. Refer to Fry, (ed.), 1966, *Cubism*, for the most extensive record of documentary texts on Cubism that were published between 1908 and 1925.

6 Vauxcelles' comment was made in response to an exhibition hosted at the Salon d'Automne in 1905 that included paintings by Matisse, Derain and De Vlaminck, in addition to sculptures executed in a conventional, classical idiom by one Marque. The stark contrast between these different stylistic approaches prompted Vauxcelles' exclamation *"Donatello parmi les fauves"* (Donatello amongst the wild beasts).



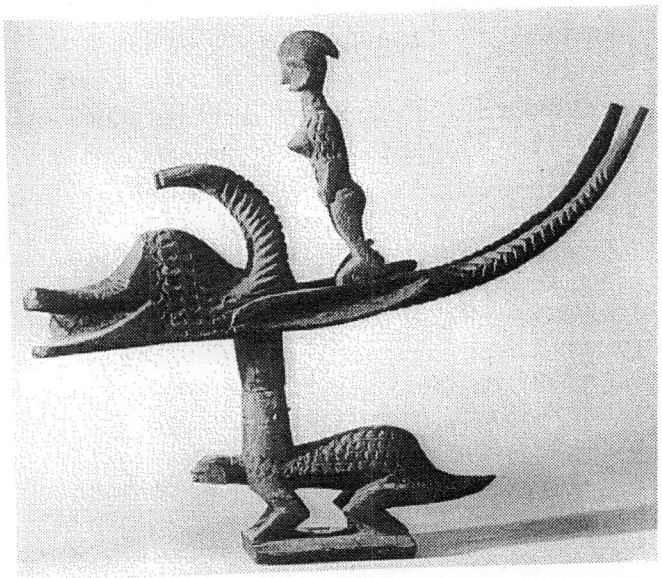
5.5 San rock painting: Untitled, Kalahari (c. 5000 B.C.).



5.6 Ndebele mural and decorative art: Gauteng (current).



5.7 African art: Ancestral figure, Dogon (n.d.).



5.8 African art: Antelope head-dress, Bambara (n.d.).

significance to the profound extent as did Picasso. Edward Fry (1966: 12), art historian and authority on Cubism, argues that Fauvism was rather an intensification of previous artistic developments and "did not mark a decisive advance beyond the innovations of late nineteenth-century painting". Instead of a coherent art movement, Fauvism was a spasmodic process of painterly experimentation that succeeded in sustaining the creative exuberance introduced by the Post-Impressionists.

Cubism initially emerged as a corollary to Fauvism due to physical proximity, and a mutual appreciation for Post-Impressionism, African art and Oceanic art. Braque was, before being introduced to Picasso by Apollinaire in 1907, closely associated with the Fauves, but his work already alluded to a different formal approach. According to Copplestone (1985: 49), Braque regarded Fauvism, in retrospect, as a minor stage in his artistic career. Notwithstanding, there can be no doubt that both he and Picasso were substantially influenced by the aesthetic sensibilities of the Fauves, particularly regarding the non-representational use of colour. Picasso's interest, from approximately 1905, in a different pictorial approach with which to portray the human figure coincided with the aesthetic intentions of the Fauves. Picasso and Braque were also indebted to the Fauves for having introduced them to African art.

5.4.2 African Art

African art played a seminal role in the genesis of Cubism. In addition to African artefacts amassed by the Fauves, the pioneering "Negro Art Exhibition", hosted at the Musée d'Ethnographie in Paris (currently known as the Musée de l'Homme) in 1907, was another major event that shaped the aesthetic sensibilities of Picasso and Braque.

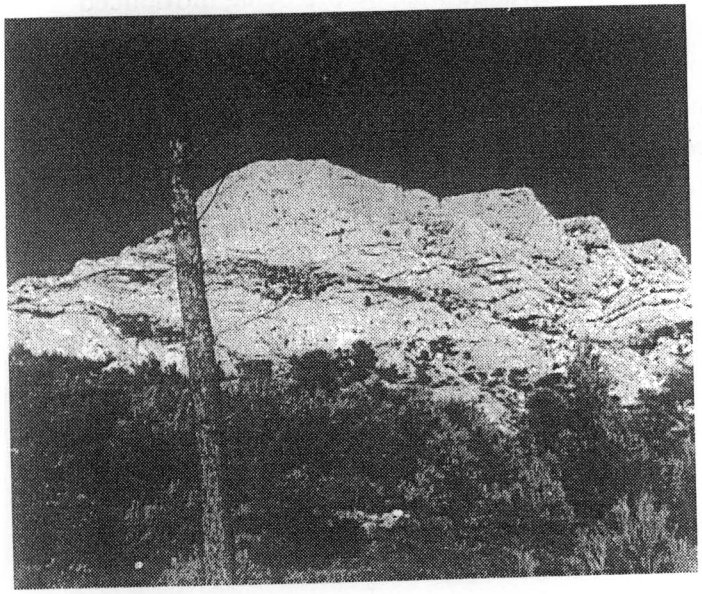
Although Picasso's introduction to African art remains contentious, [7] he was the first modern artist to fully comprehend and internalize the intrinsic value that the unselfconscious tradition could exercise on the Western perception of art and aesthetics. According to Salmon (1912; 1966: 82) Picasso's "enthusiasm [for African art] was not based on any trivial appetite for the picturesque."

African creative expression evolved from a surface art form to the adornment of artefacts, and the making of free-standing and moving sculpted objects, including masks for ritualistic purposes. Like their ancient forebears, African mural artists were by and large unfamiliar with any illusionary representational conventions (*figs 5.5-5.6*). [8] Perhaps because of this 'ignorance', African artists never aspired to, or aimed at, naturalistic depiction.

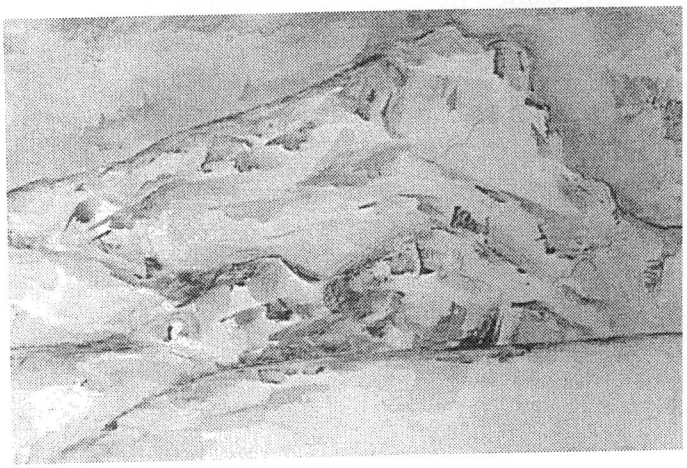
---

7 According to Fry (1966: 48), De Vlaminck claimed in his autobiography *Tournant Dangereux* (1929) that he was the first modern artist to admire and collect African artefacts, which he had aquired since 1904 from French sailors returning from Africa. He shared this interest with Derain who, in turn, introduced Matisse to African art. De Vlaminck maintained that it was as a result of this mutual interest that Fauvism materialized. He also asserted that it was Derain (instead of Matisse, as often claimed) who introduced Picasso to African art in 1906. Salmon contradicted this in his memoirs *Souvenirs sans Fin* (1961), claiming that it was at the "Negro Art Exhibition" that he, Picasso and Apollinaire first discovered African art. Picasso complicated matters further by stating that he had been unfamiliar with African art until after the completion his seminal work, *Les Demoiselles d'Avignon*, in 1907 (according to the interview conducted by Christian Zervos, published as "Picasso" in 1932). Despite the unmistakable resemblance between the faces of the *Demoiselles* and African masks, Picasso's provocative statement has, according to Fry (*ibid.*), been refuted by Salmon, Apollinaire and gallery-owner Daniel-Henry Kahnweiler. Kahnweiler also claimed that Picasso had already amassed a considerable collection of African artefacts by 1906. Picasso's flippant denial coincided with his maverick personality, as if not to permit any extraneous influences to detract from his genius.

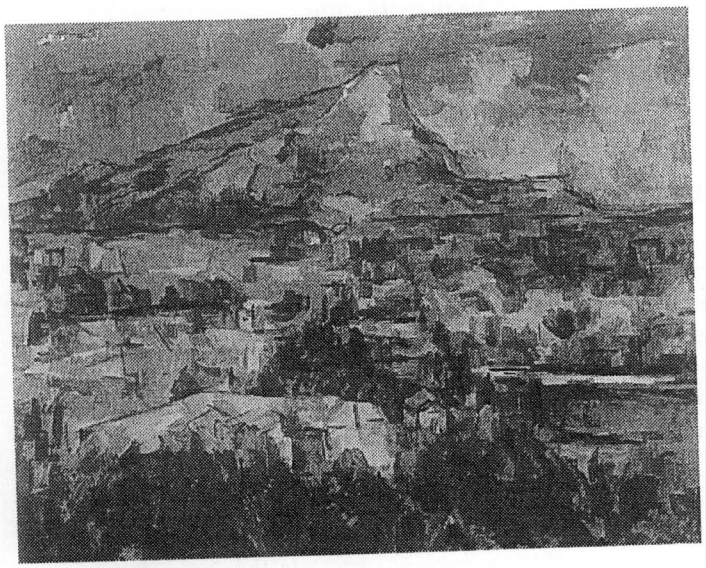
8 As referred to in the previous chapter, Laude, J., 1971; 1973, *The Arts of Black Africa*, trans. Dedock, J. (Los Angeles: Univ. of California Press), 3-6, mentions that the artefacts commissioned by Portuguese traders, dating from the 16th and 17th centuries, did mimic European naturalistic conventions. Although there does not seem to be a similar account pertaining to the pictorial (or mural) arts, it does not imply that these skills were lacking, as some would have us believe. Rather, that the notion of art was approached from completely different premises.



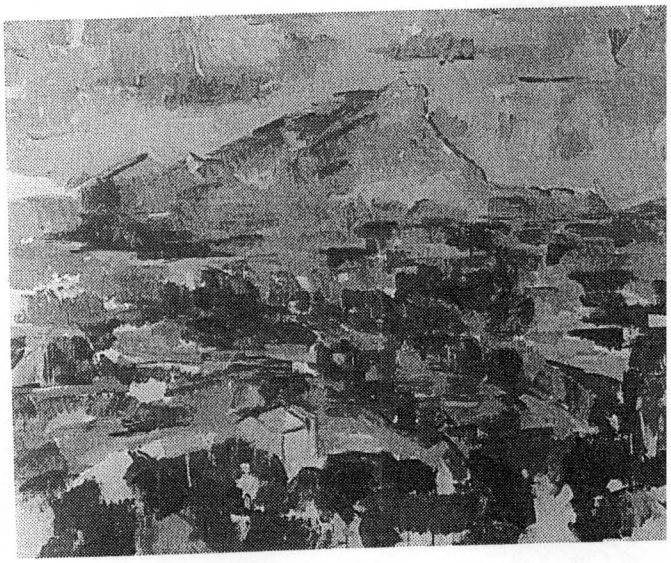
5.9 Present view of Mont Sante-Victoire, Aix-en-Provence.



5.10 Cézanne, *Monte Sante-Victoire* (c. 1900).



5.11 Cézanne, *Mont Sante-Victoire* (1906).



5.12 Cézanne, *Mont Sante-Victoire* (1906).

Yet, African art predominates not as a painterly phenomenon, but as a plastic art form – paradoxically, the traditional medium with which to convey naturalism with greater ease (*figs 5.7-5.8).* On the other hand, it may well be that African artists, living so close to nature, never saw any need to imitate the natural precedent, devising instead complex codes to communicate their artistic intentions that served particular social, cultural and religious purposes. As African art performed a completely different task to the classical European model, creative expression was approached from alternative premises – hence its simplified, deductive and metaphorical mode of communication. Consequently, African art defies definition according to, firstly, the customary, Western, perception of art and, secondly, classical aesthetic norms and artistic criteria.

Picasso, however, never pondered the utilitarian significance of African art. Instead, he recognized its conceptual worth. In the words of John Golding (1967; 1991: 53):

> "Certainly Picasso seems to have realised almost at once that here was an art that held the key to the young twentieth century painters' desire to emancipate themselves from visual appearances, in that it was an art that was simultaneously representational and anti-naturalistic."

5.4.3 Cézanne

Of all the artists from the impressionist genre, Cézanne exercized the most significant influence on the genesis of Cubism. Considered somewhat of an outsider, Cézanne was never fully accepted by his peers and his work was constantly rejected by salons and art dealers. It was only late in his life that he earned recognition, culminating in a series of retrospective exhibitions hosted at the Salon d'Automne, Paris, from 1904 until 1907. His pioneering pictorial innovations earned him a considerable following, particularly amongst the younger generation of modern artists. His influence was not only discernible in the work of the Fauves and the Cubists, but was echoed consistently in their writings. The following extract from "The Origins of Painting and its Representational Value" (1913; 1966: 123) by (Orphic) Cubist Fernand Léger (1881-1955), serves as a case in point:

> "Among the impressionists one painter, Cézanne, fully understood what was incomplete about impressionism. He felt the necessity of reviewing form and design to match the new colour of the impressionists. His life and his work were devoted to the quest for this new synthesis." [Emphasis as quoted.]

A quotation from the seminal text at the time, *Du Cubisme* (Metzinger and Gleizes, 1912; 1966: 10), reads: "To understand Cézanne is to foresee Cubism."

Cézanne worked in seclusion from extraneous influences and dedicated the last twenty years of his life to the intense study of nature, ceaselessly painting the exact same landscape at Aix-en-Provence (*figs 5.9-5.12*). He was adamant that nature is the most authentic source of artistic reference and repeated this conviction in his correspondence with friends dating from 1903 and 1904:

> "All things, particularly in art, are theory developed and applied in contact with nature." [9]
> "The Louvre is a good book to consult but it must only be an intermediary. The real and immense study that must be taken up is the manifold picture of nature." [10]
> "The painter must devote himself entirely to the study of nature ... Talks on art are almost useless ..." [11]

---

9 Excerpt from a letter written by Cézanne addressed to Emile Bernard, 12 May 1904; reprinted in Chipp (1968: 19).
10 Excerpt from a letter written by Cézanne addressed to Bernard, 12 May 1904; *ibid.*
11 Excerpt from a letter written by Cézanne addressed to Bernard, 26 May 1904; *ibid.*

Cézanne never attempted to reproduce but rather to represent nature, wrestling with a number of fundamental pictorial issues that were central to his artistic development:

1. As a result of his incessant studies of the mountainous French countryside, he increasingly started to emphasize the formal properties of his subject matter. In the process, he consciously aimed at sustaining its volumetric credibility, but without succumbing to conventional illusionistic procedures. According to Fry (1966: 14): "... by the mid-1880s [Cézanne] had developed a way of denying illusionism by means of integrating surface and depth in his paintings, particularly by 'passage' – the running together of planes otherwise separated in space – and other methods of creating spatial ambiguity ..." Thus, Cézanne had achieved the necessary sense of pictorial depth through the manner in which he applied colour and tone, and an unprecedented faceting of form.

2. By constantly changing his point of observation, Cézanne made comprehensive pictorial analyses of the subject matter under scrutiny. He also alluded to an optical synthesis of the different vantage points of the subject matter, which greatly influenced Picasso. In the words of Golding (1967; 1991: 56): "By tipping an object up towards the spectator [Cézanne] tells us what it looks like from above as well as from the front; sometimes he seems to edge around the objects so that we glimpse a side view as well. Cézanne, we know, returned to his subject again and again, and it seems very likely that his obsessive fascination with objects led him unconsciously to move up on them, shifting his position slightly at every painting session, so that we find in certain passages the same sort of optical synthesis which Picasso had consciously and violently achieved in the squatting 'Demoiselles'."

3. Cézanne's preoccupation with form led him to treat his subject matter as so-called constructions after nature. He commented: "I simply must produce after nature. Sketches, pictures, if I were to do any, would merely be constructions after nature, based on methods, sensations, and developments suggested by the model, but I always say the same thing." [12] This pursuit led to a formal simplification that prompted his much-quoted statement of 1904: "May I repeat what I told you here: treat nature by the cylinder, the sphere, the cone, everything in proper perspective so that each side of an object or a plane is directed towards a central point." [13] He consequently alerted future artists to the possibility of re-applying the antiquated process of decoding nature and transcribing it as geometric configurations. However, the difference was that this process of decodification – or geometric simplification – could be applied to the visual arts instead of architecture. To paraphrase in the words of French art critic Léon Werth (1879-q.v.): "The relationship between the geometrical forms created by the mind and the forms of nature has preoccupied the [ancient] philosophers. And if geometry owes its certainty to the suggestions of our sense, why not reverse the process and go from geometry to nature?" (1910; 1966: 57)

Although Cézanne's formal simplifications did not nearly approach the geometric significance that he inferred to, he paved the way towards pictorial abstraction. It is, in the final analysis, the potential latent in Cezanne's work, that heralded him the progenitor of Cubism.

Cooper and Tinterow (1983: 11) maintain that Braque "was the first, by rather more than a year, to understand and accept Cezanne's innovatory methods of representation, from which he drew certain conclusions (winter 1907-8) affecting the handling of forms in his own work". According to them, Picasso's paintings only started to reflect Cézanne's formal innovations from the beginning of 1909,

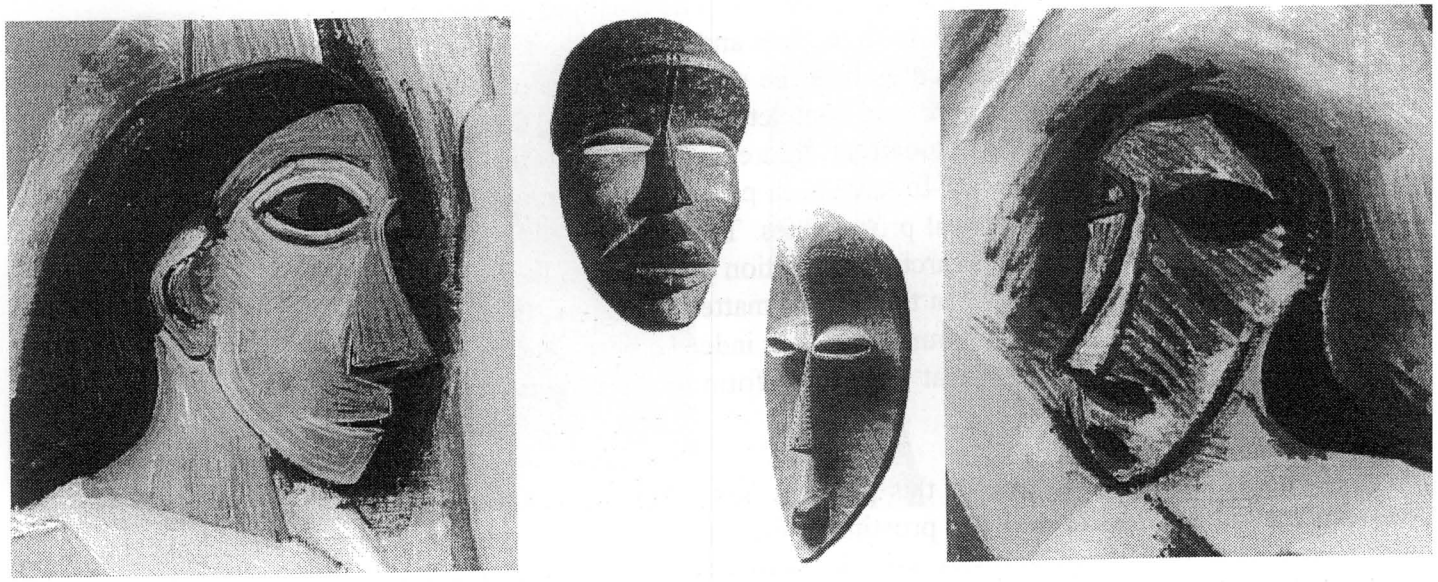
---

11 Excerpt from a letter written by Cézanne addressed to one Paul, 13 October, 1906; reprinted in Chipp (1968: 23).

12 Excerpt from a letter written by Cézanne addressed to Bernard, 15 April, 1904; *ibid.* (19).



5.17 Picasso, *Les Demoiselles d'Avignon* (1907).



5.18 Comparison of *Les Demoiselles d'Avignon* and African masks.

his seminal essay *The Anecdotal History of Cubism* (1912; 1966: 82), Salmon abjured the spontaneous christening of the new canvas as the so-called philosophical brothel. The preparatory sketches for *Les Demoiselles d'Avignon* included two male figures that were omitted as the painting progressed, suggesting that Picasso had initially intended some allegorical reading thereof (*fig. 5.19*). The subject also recalls Picasso's interest in characters who had been marginalized by society – a theme he had explored extensively during his preceding Pink and Blue Periods (*figs 5.13-5.14*). According to Fry (1966: 13):

> "But while the brothel as a theme appeared frequently in late nineteen- and early twentieth-century painting, as for example in Toulouse-Lautrec and Rouault, Picasso's version is as far removed from the spirit of irony or pathos of his predecessors as it is from the empathy and restrained lyricism of his earlier paintings ..."

Salmon (1912; 1966: 82) adds:

> "For the first time in Picasso's work, the expression of the faces are neither tragic nor passionate. These are masks almost entirely freed from humanity."

5.5.2 Influences

Les Demoiselles d'Avignon is an exceptionally complex painting, least of because it synthesized so many different sources of visual reference, leaving much room for theorizing. It is maintained that this painting would never have materialized had it not been for Gauguin who kindled Picasso's interest in the art produced by primitive cultures, including that of his Spanish ancestors. [15] The simplified and exaggerated features exemplary of Iberian sculpture appeared in Picasso's paintings from 1905 (*figs 5.15-5.16*) and are evident also in the depiction of the faces of the two central figures in *Les Demoiselles d'Avignon*. In some respects, this particular painting was an extension of preceding investigations. Apart from the unmistakable influence of Cézanne and African art, Greek vase painting, Egyptian art, the elongated treatment of the human figure by Spanish mannerist painter El Greco (Domenicos Theotokopoulos, 1541-1614) and the naive paintings of Henri Rousseau (1844-1910) are also cited as sources of reference.

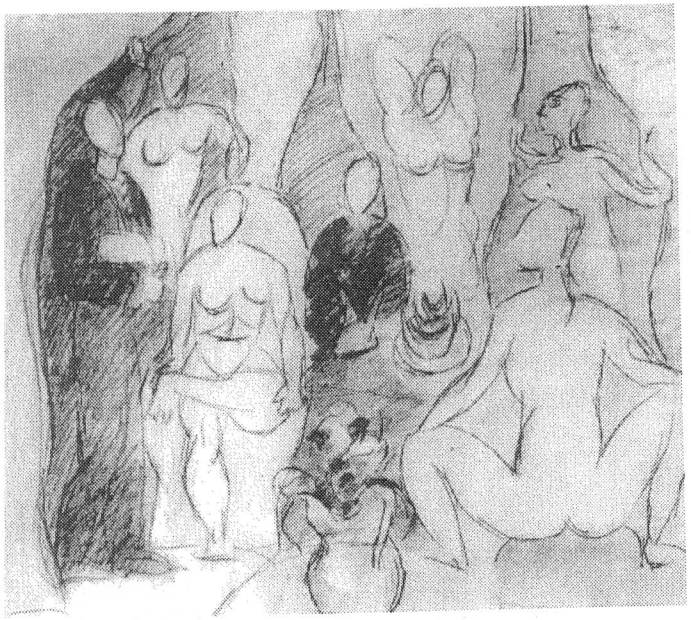
Picasso was particularly interested in the optical correlation between painting and sculpture, hence the emulation of the volumetric properties of Iberian sculpture upon which he had embarked earlier. According to art historian Yve-Alain Bois (1992: 172-173):

> "At this time Picasso is engaged in pursuing a dialogue between painting and sculpture, a new version of Renaissance *paragone*, his aim being to convey in painting the sense of volume one achieves in sculpture."

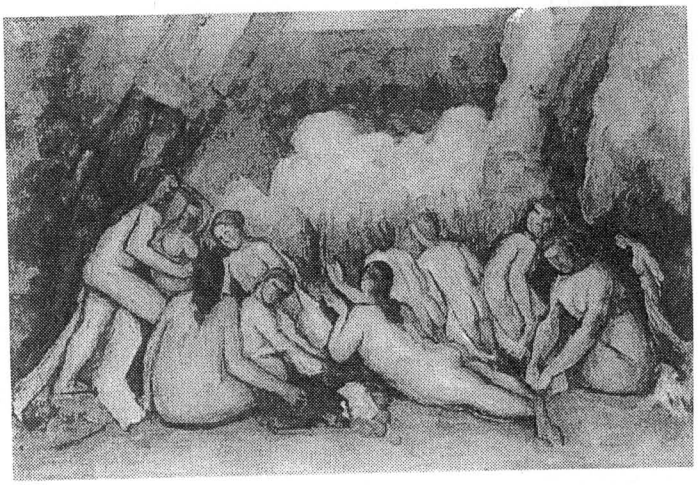
It is noteworthy that Picasso's first attempts at sculpture date from 1905. Since there is a remarkable formal correlation between the volumetric – if not sculptural – quality inherent in the paintings of Cézanne and the geometrical simplification pertinent to African sculpture, it is no coincidence that both art forms captured Picasso's attention to the extent that it did. This assumption finds corroboration in the comment by Fry (1966: 14) that "there is a precedent for Picasso's schematic treatment of human anatomy as much in Cézanne's houses and nudes as in the figures of African sculpture".

---

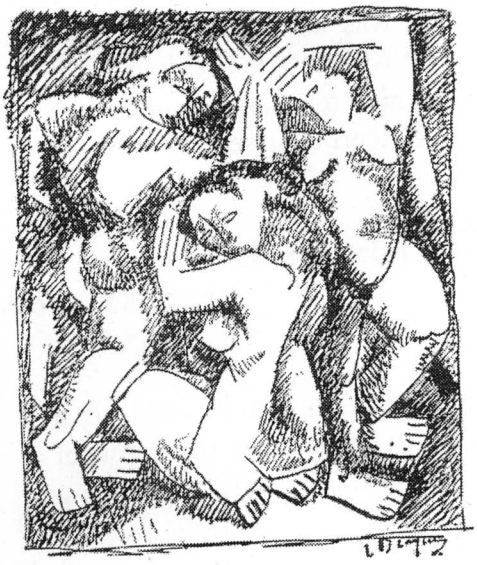
15 Iberian sculptures, unearthed at Osana in Spain, were on permanent display at the Louvre where Picasso evidently encountered the art produced by his ancestors.



5.19 Picasso, study for *Les Demoiselles d'Avignon* (c. 1906).



5.20 Cézanne, *Large Bathers* (c. 1895-1906).



5.21 Braque's first artistic response to *Les Demoiselles d'Avignon* (1907).



5.22 Braque, *Grand Nu* (1907-1908).

Cézanne's influence manifested in several ways:

1. The faceted quality of the figures and draperies in *Les Demoiselles d'Avignon* recalls his treatment of form.

2. The compositional organization is remarkably similar to a series of paintings of bathers with which Picasso must have been familiar (*fig. 5.20*).

3. Being a painter and not a sculptor, Cézanne served as an excellent example of how painting could retain its volumetric credibility without resorting to conventional illusionistic procedures.

4. Picasso's use of Cézanne's tentative method of optical synthesis produced one of the most revolutionary images in all art.

However, as Cézanne had merely alluded to the gesture of simultaneous views, Picasso would most probably not have considered it a viable pictorial option, had he not been informed by the creative freedom induced by African art.

5.5.3 Deductions

The reputation of this extraordinary painting was legendary long before it was first reproduced in 1910 in an American publication and then again only in 1925. It is uncertain when it was first publicly exhibited since some sources set the date as 1916 and others as 1937. [16] According to Keith Sutton (1966: 27-28):

> "The precise significance of this work for our century is difficult to judge in so far as that for long periods it was not known outside a small circle of artists and acquaintances of Picasso. To some extent therefore its reputation was verbal and legendary almost long before it was having a visual effect on other artists."

Salmon (1912; 1966: 82) recounts the general disappointment of Picasso's friends upon seeing *Les Demoiselles d'Avignon* for the first time:

> "The familiars of the strange studio in the Rue Ravignan, who put their trust in the young master, were for the most part disappointed when he gave them the chance of judging his 'new' work in its first form."

Subsequent to this viewing, Picasso implemented substantial changes:

> "The large picture, with its severe figures and its absence of lighting effects, did not remain long in its original state. Soon Picasso attacked the faces, whose noses were for the most part placed full-face, in the form of isosceles triangles. The apprentice sorcerer was still seeking answers to his questions among the enchantments of Oceania and Africa." (*ibid.*)

---

16 *Les Demoiselles d'Avignon* was reproduced for the first time in Burgess' article entitled "Braque", *Architectural Record*, published in May 1910. The next reproduction appeared only fifteen years later in an article by surrealist author André Breton entitled "Le Surréalisme et la Peinture", *La Révolution Surréaliste*, published in July 1925. Information regarding the first public exhibition of this painting is not as readily available.

It would be mere speculation to suggest that Picasso altered the picture in response to the disdain of his friends. It is more credible to assume that Picasso's exposure to the exhibition on African art provided him with the necessary impetus to make the dramatic changes to which the mask-like figures bear witness (*fig. 5.14*). In its final state, the painting still met with criticism. Matisse thought Picasso was making a mockery of contemporary painting. On the authority of Roland Penrose (1958: 50), Braque has been recorded to have commented that "It is as though we are supposed to exchange our usual diet for one of tow and paraffin". Regardless of what this statement implied, Braque must have grasped that *Les Demoiselles d'Avignon* broke new creative ground, judging from the drawing he produced in immediate response to it (*fig. 5.21*). This particular drawing preceded the supposed inaugural cubist painting produced by Braque in December 1907, entitled *Grand Nu* (*fig. 5.22*).

However long *Les Demoiselles d'Avignon* may have remained in Picasso's studio, the conclusions drawn from this painting were far-reaching. Not only did it encapsulate a summation of future creative potential, but it also addressed such a vast range of artistic premises that it took Picasso a lifetime to explore all the possibilities. Its most imminent impact was that it served as the catalyst for the genesis of Cubism. The lasting theoretical debate that this painting fuelled and the total redefinition of art and aesthetic appreciation that emerged as a result, bear testimony to Picasso's genius for having produced the most compelling visual document of the 20th century. Whether the premises derived from this painting were predetermined, remain open for debate. Even though Picasso never recorded his intentions or insights, he did remark in 1964:

> "A painting is never thought out and decided upon ahead of time, because it is subject to changes in thinking while in process, and when it is finished it continues to change, according to the feelings of whoever looks at it." (Porzio and Valsecchi, 1974: 79).

This painting may very well have materialized as one individual's intuitive response to an assimilated consciousness, drawing from the visual and intellectual sources at his disposal. Not only did *Les Demoiselles d'Avignon* challenge past aesthetic preconceptions, but it also revoked all previous artistic preoccupations. The following summary highlights some of the aspects which this remarkable painting touched upon.

5.5.3.1 Conceptual Significance

Although preceding artists – Gauguin and the Fauves, in particular – were intrigued by so-called primitive art, their appreciation did not extend beyond the application of novel stylistic conventions as alternative modes of pictorial rendering. Picasso, on the other hand, was the first modern artist to recognize the intellectual worth of primitive art. According to Golding (1967; 1991: 52):

> "Picasso was intuitively drawn to [African art] at a deeper and more intellectual level. Although cubist painting was from time to time to reflect the influences of certain stylistic African conventions, it was the principles underlying this so-called primitive art that were to condition the aesthetics of one of the most sophisticated and intellectually astringent styles of all times."

The unorthodox treatment of the *Demoiselles* was not only indicative of the creative freedom that an unselfconscious mode of representation exudes, but also drew attention to the fact that the depicted does not have to conform to naturalistic conventions in order to be recognized as such. It also demonstrated that optic recognition can operate through metaphorical association and, ultimately, as pursued through further investigation, through imaginary reconstruction.

The fact that these women are prostitutes is almost incidental and, in the final analysis, subordinate to the intellectual (or conceptual) significance of the work – whether initially intended or not. Sutton comments (1966: 28):

> "As it worked out, any specific allegory that Picasso had in mind, evaporates, and we are left with a work that represents, without explaining itself, the most profound development of art at the time ..."

Instead of being evaluated from a representational point of view, this painting should be reviewed from a conceptual level. The realization that art – via the African example – can exist conceptually and not rely on any form of naturalistic representation, would become central to cubist investigations and lead, in the course of events, to a self-referential art form of total abstraction.

Thus, Picasso had realized that conceptual content could be a viable alternative to representational content. Moreover, that the conceptual point of departure – the principal idea that spawned the painting's conception – can, firstly, justify the artistic act and, secondly, validify its existence as a work of art. In due course, the credibility, even the novelty, of the idea – the *raison d'être* – would become one of the prerequisites with which to evaluate the merit of the work, culminating in the more recent autonomous movements, known as Conceptual Art (1960+) and Performance Art (1960+).

5.5.3.2 The Redefinition of Aesthetics

The practice of art is, by its very nature, defined in terms of its appreciation and evaluation. As *Les Demoiselles d'Avignon* created a totally new definition and perception of art, it inevitably addressed aesthetic appreciation. Not only did Picasso challenge all past associations of what classical art encompassed or aspired to, but he also shunned the customary notion of beauty – least of all, according to Platonic dictates.

Les Demoiselles d'Avignon is an ugly painting by any yardstick. This finds support in Golding's comment (1967; 1991: 50-51) that it "created new canons of aesthetic beauty, or to put it differently, it destroyed distinctions between the beautiful and the ugly". It is furthermore poorly excecuted and inconsistently painted, giving rise to a number of pertinent issues:

1. It questioned whether art should necessarily be defined in terms of beauty and if so, according to whose criterion.

2. Unlike classical artists, Picasso felt under no obligation to represent that which is considered beautiful or, for that matter, to represent the ungainly, but beautifully excecuted.

3. Picasso's intentional technical negligence challenged past academic canons for determining artistic excellence. On the one hand, this bold gesture emphasized the importance that he attached to art being appreciated from a conceptual level. On the other hand, it raised the question whether it is at all necessary to consider technical ability as a criterion in evaluating art.

Therefore, Picasso's example established that art can be appreciated on an intellectual or a conceptual level, as well as providing visual satisfaction. In its most extreme form, it implied that it is possible to appreciate art exclusively from an intellectual premise with no aesthetic implications in mind. Even though the objective premises of beauty had been called into question since the Enlightenment, it was this particular painting that finally succeeded in altering aesthetic appreciation irrevocably, also rendering obsolete all past artistic criteria.

5.5.3.3 The Violation of Perspective

> "For five hundred years, since the beginning of the Italian Renaissance, artists had been guided by the principles of mathematics or scientific perspective, whereby the artist viewed his subject from a single, stationary viewpoint. Here it is as if Picasso had walked 180 degrees around his subject and had synthesized his impressions into a single image. The break with traditional perspective was to result, in the following years, in what critics called simultaneous vision – the fusion of the various views of a figure or object into a single image." (Golding, 1967; 1991: 53-54)

Picasso's decision to synthesize different viewpoints into a single optical experience served as the most dramatic violation of classical pictorial conventions. It was also this particular act that finally severed all ties with the classical modes of visual representation. The implications of this act were so vast that the entire spectrum of the artistic disciplines was affected, which, in addition to architecture, also included music and literature. [17]

The depiction of simultaneous views proved that pictorial depth does not have to rely on perspective or any other illusionary device to communicate the volumetric propensity of an object. In the words of Golding (*ibid.*: 53):

> "Here in the *Demoiselles* we have, albeit in a tentative and clumsy fashion, a new approach to the problem of representing three-dimensional volumes on a two-dimensional surface. It is in this that the painting's supreme originality lies."

Just as a circle with two dots can represent a face as a stylized convention communicated by association, so, too, can volume be conveyed through conditioning and, consequently, stylized pictorial means – whether compositional (planar juxtaposition), sensuous (the hierarchical distribution of form, shape, line and colour), or even tactile (collage). It was this cognition, in the author's opinion, that spawned the reductive methodology of Cubism, setting in motion a chain reaction of pictorial events that introduced a plethora of artistic conventions never conceived of before in the entire history of the visual arts.

As a result of this extraordinary act, Picasso challenged the stationary viewpoint exemplary of classical painting, irrespective of the number of vanishing points. As there no longer existed a single and authoritative viewpoint from which to observe the subject matter, the resultant multi-focus 'legitimized' the pictorial content of the two-dimensional which the Classicists so desperately tried to disown. In due course, the acknowledgement of the canvas as a two-dimensional surface resulted in end-

---

17 "Le Sacre du Printemps" (The Rite of Spring, 1913) by composer Igor Stravinsky (1882-1971) is said to have been a musical response to Einstein's space-time theories with regard to the manner in which the rhythmic intervals of classical musical scores were altered. Stravinsky's example not only created a furore at the time, but also marked the birth of contemporary music.
The idiosyncratic prose of Gertrude Stein serves as the best example of a literary response to Cubism, dating from her close association with Picasso. An extract by Fry (1966: 55) from her so-called "Prose Portrait of Picasso", first published in 1912 in *Camera Work*, reads as follows: "One whom some were certainly following was one who was completely charming. One whom some were certainly following was one who was charming. One whom some were following was one who was completely charming. One whom some were following was one who was certainly completely charming." Fry (*ibid.*: 56) provides an eloquent comparison between Stein's prose and Analytical Cubism: "Both words and phrase become in this way very much like physical objects, and the progressive development of her thought seems to circle, and little by little define, an unapprehended subject behind the opaque surface of the prose."

less compositional and graphic permutations, which, paradoxically, generated unforeseen possibilities when extrapolated into the third dimension – as pursued so effectively by the De Stijl architects, the Suprematists and Constructivists.

The synthesis of multiple vantage points also induced an imaginary sense of movement, which, on the one hand, magnified the conceptual content of the painting. But, on the other hand, it recruited the psychological involvement of the spectator, which was henceforth explored to great effect, culminating in the exploits of the pop artists of the 1960s. The induced sense of movement, coupled with multiple vantage points, was also assimilated architecturally and concretized magnificently in Le Corbusier's purist villas. Thus, Picasso had developed the optical means to counter the restrictions that had been imposed on the pictorial arts since the algorithm of perspective during the 15th century, heralding the self-conscious reversal to the aspectival mode of visual communication.

5.5.3.4 The Space-Time Dimension

Picasso stated emphatically in 1923 that he painted *Les Demoiselles d'Avignon* without any preconceptions:

> "Mathematics, trigonometry, chemistry, psychoanalysis, music and many other things have been cited as being components of Cubism and have been taken out of context in order to explain Cubism. But all this is pure literature, which is another way of saying pure nonsense. When we invented Cubism we didn't have any intention of inventing Cubism. We simply expressed what was inside us. No one of us ever presented a project or a plan." [18]

Picasso's comment is completely warranted as the creative act, in retrospect, is seldom as deliberate as academics would have it. Yet, it cannot be denied that Picasso's decision to synthesize multiple views (whether calculated or not) gave rise to tremendous theoretical speculation, particularly in view of the fact that the painting was produced within less than two years after the publication of Einstein's *Special Theory of Relativity* in 1905. [19] The resultant space-time conclusions drawn from this painting heralded incalculable consequences, particularly for the plastic arts. Picasso's decision to synthesize what normally occurs in time and through space into a single optical experience magnified the existence of space and time, but, specifically, as autonomous artistic concepts.

Due to the fact that time is numerically regulated, Man's comprehension of time has always been very vivid with all of mankind being at its mercy. However, at the beginning of this century, Einstein proved scientifically that time is in fact relative (reinforced when space travel became a reality). By compressing a sequential occurrence into a simultaneous experience, Picasso visually illustrated the relative position occupied by time, subliminally demonstrating what Einstein had proved mathematically a year or two before – hence the clamour. But, and equally profound, Picasso's

---

18 This much-quoted statement by Picasso resulted from the interview conducted with De Zayas – first published as "Picasso Speaks", *The Arts*, in May 1923. This particular extract is quoted from Porzio and Valsecchi (eds.), 1994, *Understanding Picasso* (New York: Newsweek Books), 87.

19 Apart from Einstein, the philosophies of Henri Bergson (1959-1941) is often cited as another source of reference for the space-time continuum illustrated by *Les Demoiselles d'Avignon* (in spite of Picasso's unfamiliarity with any of these conjectures). Bergson had as early as 1889 made a distinction between scientific and metaphysical time in *Time and Free Will*. In his later publications, *An Introduction to Metaphysics* (1903) and *Creative Evolution* (1907), Bergson submitted the theory that with the passage of scientific (or 'quantifiable') time, one accumulates perceptual information about an object which informs one's conceptual knowledge (or cognition) of the object. Picasso's depiction of simultaneous views found an obvious precedent in Bergson's theory of the assimilation of sequential experiences. Both Bergson and Einstein were enthusiastically referred to by the early protagonists of Cubism. Ironically, Fry (1966: 67) notes that Bergson persistently denied knowledge or approbation of Cubism, as alluded to by Salmon and numerous others.

example introduced a so-called fourth dimension [20] – equated with time and, consequently, movement – to the static realm of the pictorial arts. The modern cognition of space was exactly the inverse of that of time. In classical art, the principal means of communicating visual observation on a flat surface was through the application of perspective – intrinsically a deceptive mechanism of organizing the spatial relationships that exist between different objects. As a result of the self-conscious defiance of perspective, the capacity that space had assumed in the visual arts up to that point was radically altered. In fact, since the algorithm of perspective, space had assumed a relative position because perspective created an illusion of measured distance on a distorted surface. Within such a pictorial context, space only existed in an illusionary capacity, reinforced by the conditioning of our own cognition – the rudimentary knowledge that all objects are three-dimensional and depth-related. The introduction of multiple vantage points induced movement – albeit in an imaginary sense – in the 'real', 'physical' space around the object. The resultant psychosomatic experience (for want of a better word) not only exposed the relative position previously assumed by space, but magnified, also, the autonomy that space as an artistic or plastic concept could assume – whether by acknowledgement or intentional 'dis'-acknowledgement.

Consider the following description by Giedion (1941; 1967: 436):

> "The cubists did not seek to reproduce the appearance of objects from one vantage point; they went around them, tried to lay hold of their inner constitution ... Cubism breaks with Renaissance perspective. It views objects relatively: that is, from several points of view, no one of which has exclusive authority. And in so dissecting objects it sees them simultaneously from all sides – from above and below, from inside and outside. It goes around and into its objects. Thus, to the three dimensions of the Renaissance which have held good as constituent facts throughout so many centuries, there is an added fourth one – time ... The presentation of objects from several points of view introduces a principle which is intimately bound up with modern life – simultaneity. It is a temporal coincidence that Einstein should have begun his famous work, *Elektrodynamik bewegter Körper*, in 1905 with a careful definition of simultaneity."

Banham (1960a; 1994: 112, footnote 11), though, contests Giedion's' statement of a "temporal coincidence":

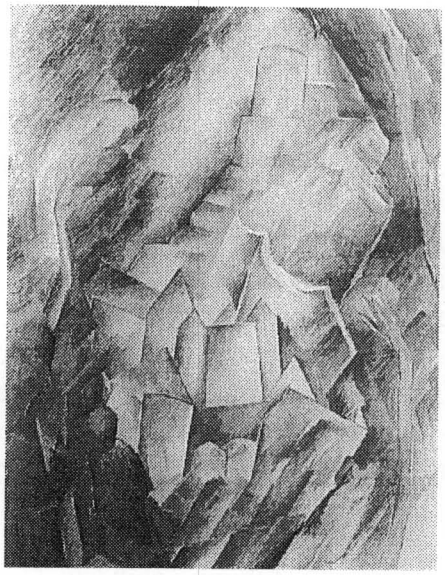
> "Bergson was widely discussed at the time: in the circle of the magazine *Poesia*, in the Apollinaire circle ... and by the Vorticists in England. The situation with Einstein is less clear: ideas marginal to the theories of relativity were certainly current in Cubist circles, and Gleizes refers confusedly to Reimannian geometry in *du Cubisme*, and Apollinaire, in a much-quoted and over-rated passage of his *Peintres Cubiste* refers to *la quatrième dimensio*n as a piece of established studio jargon by 1912. Although doubt has been cast on the ability of the Cubists

---

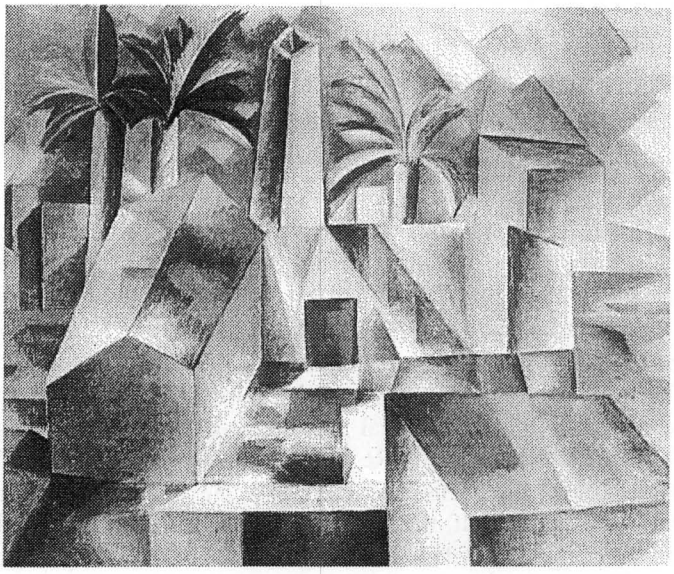
20 According to Fry (1966: 119), Apollinaire was the first author to refer to the fourth dimension in relation to the visual arts, evidently derived from the popularization of Einstein's and Bergson's theories. Apollinaire's first written reference appeared in "La Peintures Nouvelle", *Soirées de Paris*, in April 1912. This article, together with several others, were collectively published as *Les Peintres Cubistes* in 1913. In a translated extract from Fry (*ibid.*: 115-116), Apollinaire provided the following description: "Until now, the three dimensions of Euclid's geometry have satisfied the restlessness of great artists yearning for the infinite ... The painters have been led quite naturally, one might say by intuition, to preoccupy themselves with the new possibilities of spatial measurement which, in the language of the modern studios, are designated by the term 'The Fourth Dimension' ... Regarded from the plastic point of view, the Fourth Dimension appears to spring from the three known dimensions: it represents the immensity of space eternalizing itself in all directions at any given moment. It is space, itself, the dimension of the infinite; the Fourth Dimension endows objects with plasticity." In *Du Cubisme*, Metzinger and Gleizes cited non-Euclidian geometry and the theories of the influential German mathematician Georg Riemann (1826-1866) as further sources of reference in comprehending the spatial significance of Cubism. However, Fry (*ibid.*: 111-112, 119-120) is eminently critical of these quasi-scientific explanations since they obscure the significance that he ascribes to Cubism, namely, the countering of classical aesthetic premises and the development of novel modes of artistic expression.



5.23 Cézannian Cubism: Braque, *Big Trees at l'Estaque* (1908).



5.24 Cézannian Cubism: Braque, *La Roche Guyon: Le Château* (1909).



5.25 Cézannian Cubism: Picasso, *Factory at Horta de Ebro* (1909).

> to know about such matters ... it would appear that Giedion's proposition that resemblances between the painting of the period and Einsteinian ideas are simply 'a temporal coincidence' should be treated with some reserve – the possibility of conclusively 'Relativist' art cannot be ruled out."

Regardless of whether or not Picasso was familiar with any of these scientific conjectures, the realization that space could be conceived of independently from the picture plane, independently from any formal container, dramatically changed the artist's and, in due course, the architect's response to space. Moreover, the fact that space could be perceived of as an *a priori* artistic concept heralded incalculable consequences for the entire spectrum of the plastic arts – with architecture being the ultimate manifestation of manipulated space.

5.6 THE EVOLUTION OF CUBISM

The infinite possibilities latent in *Les Demoiselles d'Avignon* spawned the genesis of a radically new aesthetic tradition. Picasso's revolutionary pictorial innovations found fertile ground in Braque's work, which, in turn, influenced Picasso. The birth of Cubism resulted from the unique collaboration between these two accomplished artists who shared their respective assimilations and interpretations.

However, neither Picasso nor Braque immediately internalized the magnitude of the conceptual content inherent in *Les Demoiselles d'Avignon*. Contrary to expectations, the conclusions drawn from this extraordinary painting did not manifest in sequential fashion. Instead, it evolved as a series of intuitive pictorial innovations. It developed relatively slowly during its embryonic years, but gained considerable momentum two years later when radical transformations occurred in a matter of weeks. This rapidity stemmed from the fact that once a specific pictorial discovery or conceptual connection had been made, it immediately suggested another avenue worthy of exploration. In retrospect, the following academic distinctions have been awarded to the evolution of Cubism.

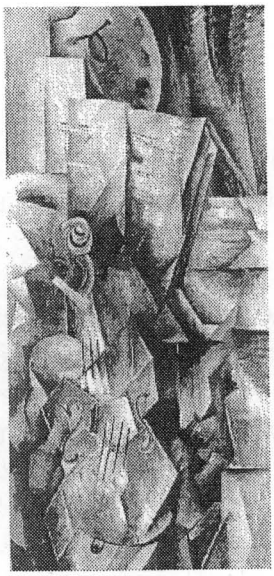
5.6.1 Cézannian Cubism (1907-1909)

During this embryonic stage of Cubism, the artists were less concerned with the conceptual implications inherent in *Les Demoiselles d'Avignon* than with depicting the volumetric propensity of their subject matter without retort to perspective and *chiaroscuro*.

Braque adopted Picasso's flexible approach regarding the treatment of the human figure in *Grand Nu*, his immediate painterly response to *Les Demoiselles d'Avignon*. He also combined several viewpoints, but demonstrated not nearly as dramatically as in Picasso's painting. Fry (1966: 16-17) is of the opinion that "In the *Grand Nu* we can almost sense Braque's struggle to come to terms with Picasso's thinking, which he must not have understood at all well at first". This initial stage of Cubism was intrinsically an extension of Picasso's ardent interest in the manner in which the voluminousness of sculpture can be conveyed pictorially, warranting the following commentary by Penrose (1958: 72):

> "Picasso's imagination was still activated by sculptural influences but, working as a painter, he uses his brush like a chisel in soft wood".

This formal voluptuousness was achieved by pursuing Cézanne's faceted treatment of form, combined with arbitrarily chosen vantage points and light sources (*figs 5.23-5.25*). By eliminating all unnecessary observed detail, the artists emphasized the formal aspects of the subject matter, which, akin to Cézanne, was increasingly simplified, and alluded to an underlying geometric substructure. It is noteworthy that it was Braque's landscape studies from this particular period that pre-empted Vauxcelles' comment on the "cubic" nature evident in Braque's work.



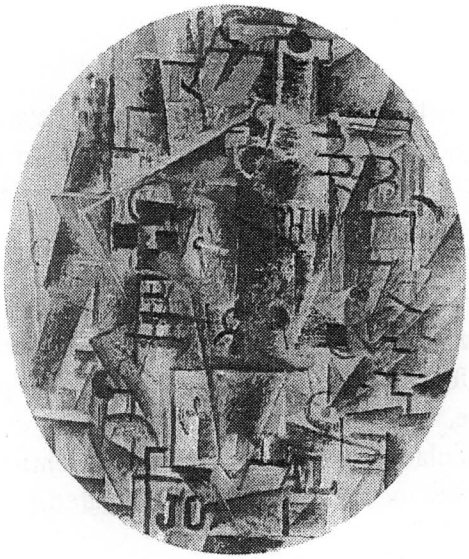
5.26 Analytical Cubism: Braque, *Violin and Palette* (1910).



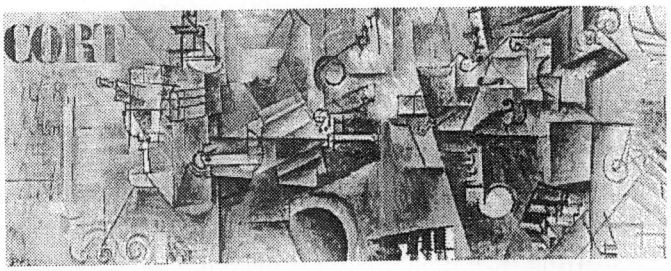
5.27 Analytical Cubism: Picasso, *Woman Wearing a Hat* (1910).



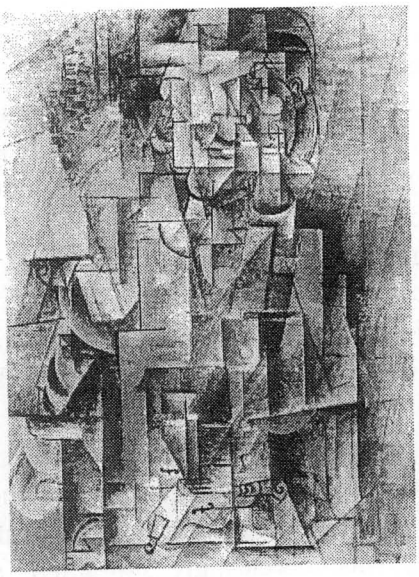
5.28 Analytical Cubism: Picasso, *Portrait of Ambroise Vollard* (1910).



5.29 Hermetic Cubism: Braque, *The Bottle of Rum* (1912).



5.30 Hermetic Cubism: Picasso, *Still-Life on a Piano* (1912).



5.31 Hermetic Cubism: Picasso, *Man with a Violin* (1912).

5.6.2 Analytical Cubism (1910-1912)

This period of intense experimentation followed from the almost daily contact between Picasso and Braque. The denotation "Analytical Cubism" [21] refers to their pictorial methodology that dissected – or analyzed – the formal aspects of the subject matter. Analytical Cubism is characterized by the transition from a formal disintegration to a planar fragmentation; the treatment of the composition as a so-called *tableau-objet*; the restricted use of colour; and the metamorphosis from the perceptual to the conceptual.

Braque's contribution to this stage of Cubism is prominent in *Violin and Palette* (*fig. 5.26*), embarked upon during the winter of 1909 and completed in 1910. The faceted treatment of the subject matter had become more rigorous, eroding the distinction between the contours of the object and its foreground and background. Braque also introduced a nail, casting its own shadow, at the top of the painting. This strange gesture creates a bizarre *trompe l'oeil* effect and draws attention to the fact that the composition – despite the voluminousness of the rendering – has been excecuted on an intrinsically flat surface. This peculiar act contributed to the composition being regarded as the subject matter, and not the actual objects – an interest that was furthered in a series of oval shaped canvases, which reinforced the autonomy of the painting (in its totality) as the so-called *tableau-objet* (subject-picture).

The juxtaposing of the two-dimensional and the three-dimensional also created disconcerting visual ambiguities that shifted the emphasis from this point onwards from the perceptual to the conceptual – encapsulating the qualities first suggested in *Les Demoiselles d'Avignon.* Picasso also pursued this optic ambiguity in a series of portrait studies during 1910 (*figs 5.27-5.28*). Through a unique process of formal disintegration, the subject is depicted as a series of fragmented planes, which, paradoxically, still convey a distinct sense of depth due to the manner in which tone and light were applied. Yet, despite its fragmentation, the painting bears an uncanny resemblance to the sitter.

5.6.3 Hermetic Cubism (1911-1912)

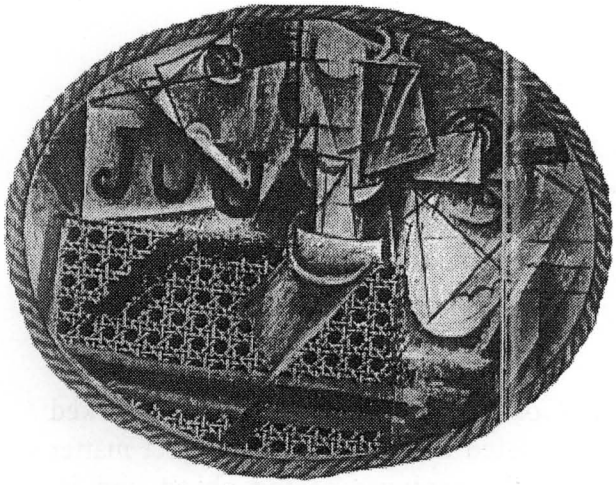
Analytical Cubism reached its zenith between 1911 and 1912. Because of the increasing difficulty to decipher the content, some art historians refer to this stage as "hermetic".

Although an extension of the dissecting methodology developed during the preceding phase, the subject matter had been fragmented to such an extent that the original point of departure was barely recognizable (*fig. 5.29*). The Cézannian procedure of treating form as faceted volumes had been surpassed by a planar dissection, representing the equivalent of volume. Colour and tonal variations were employed only to distinguish between different planes. Individually, the faceted shapes serve no purpose, but, when assembled, they resemble an object – often seen from several points of view – which, according to Fry (1966: 24), "has proved tempting with such works to speak of ... implications of a 'Fourth Dimension'".

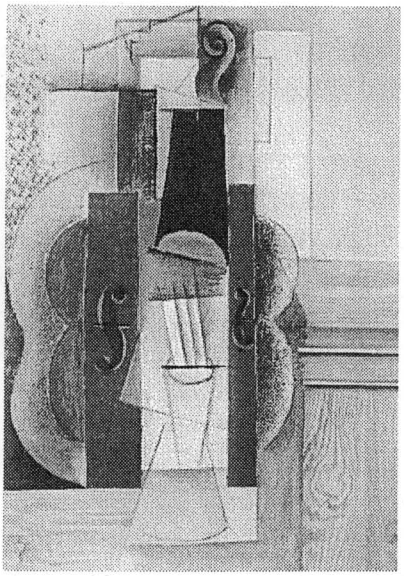
Due to the disparate treatment of the composition, the subject matter became progressively difficult to decipher. The content is recognizable only by one or two characteristics and is often dependent on the title of the painting. The disassociating and monochromatic use of colour – varying tones of brown and black – adds to its complexity, emphasizing the artistic process rather than the perceptibility of the respective objects. In order to overcome this visual obscurity, the artists incorporated topographic signs – such as, words letters and numbers – to provide clues to its semiotic content and also to

---

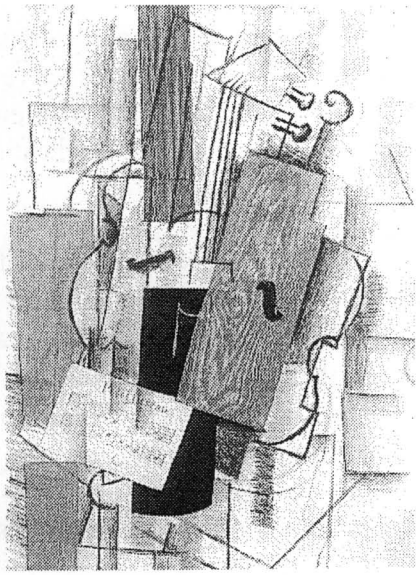
21 Fry (1966: 63) mentions that the terms "analytical" and "synthesis" – descriptive of these particular tendencies in Cubism – were first used by the art critic Roger Allard in 1910 in the essay "Au Salon d'Automne de Paris", *L'Art Libre*. Both terms came into general use with the publication of Kahnweiler's renowned book *Weg zum Kubismus* (Munich) in 1920.



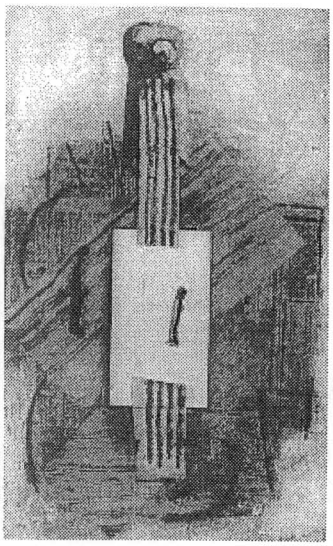
5.32 Transition from Hermetic to Synthetic Cubism: Picasso, *Still-Life with Chair Caining* (1912).



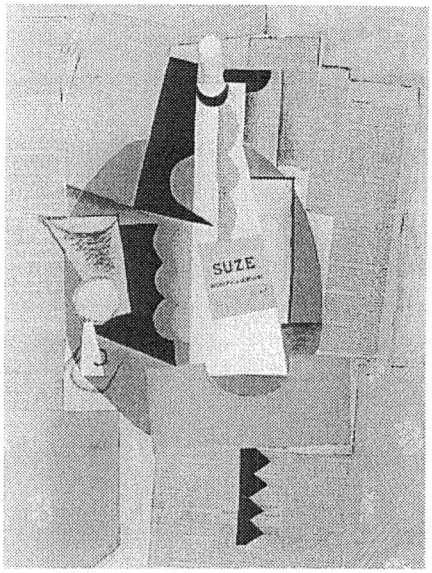
5.33 Synthetic Cubism: Picasso, *Violin Hanging on a Wall* (1912).



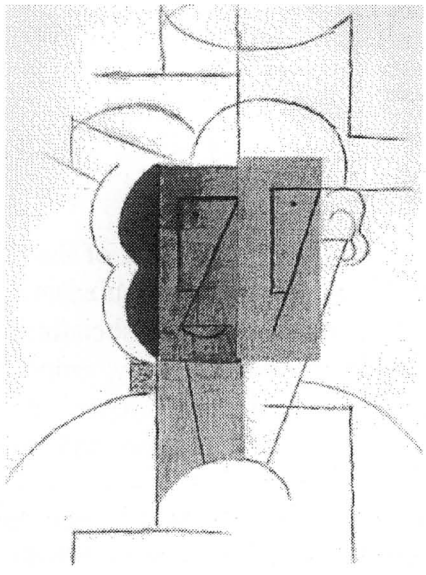
5.34 Synthetic Cubism: Braque, *Violin and Sheet-Music on a Table* (1913).



5.35 Synthetic Cubism: Picasso, *Violin* (1913).



5.36 Synthetic Cubism: Picasso, *The Bottle of Suze* (1913).



5.37 Synthetic Cubism: Picasso, *Man with a Hat* (1913).

maintain a link with the phenomenal world (*fig. 5.30*).

The fact that neither artist signed his work dating from this period, signified their total emotional detachment from the subject matter. By now, Cubism had evolved as an art form with an autonomous identity, complete with a methodological component at which both Picasso and Braque had become equally skilled and which makes it particularly difficult to distinguish between their individual efforts.

Porzio and Valsecchi (1974: 64) describe the principal objectives of this stage of Cubism as follows:

> "The idea was to arrange the forms in a plane so that the object or figure could be recognized not through perspective illusion, but through the analysis of its form, and also so that it could be seen from several points of view. These multiple analyses of a total vision were put into a single image, thus giving immediate unity to what had been seen, deduced and imagined."

Thus, Hermetic Cubism introduced the inverse of the Cézanne's pictorial treatment by using fragmented planes (instead of faceted form) to represent volume. By disfiguring the formal content, Picasso and Braque had emphasized the conceptual worth of the object, which no longer served any allegorical purpose but was predominantly employed to convey a novel artistic process. Since the depiction of the subject matter no longer relied on any perceptual representational methods, its recognition depended on an imaginary reconstruction on the part of the viewer. The French art critic Roger Allard (1885-1961) presents the following assessment:

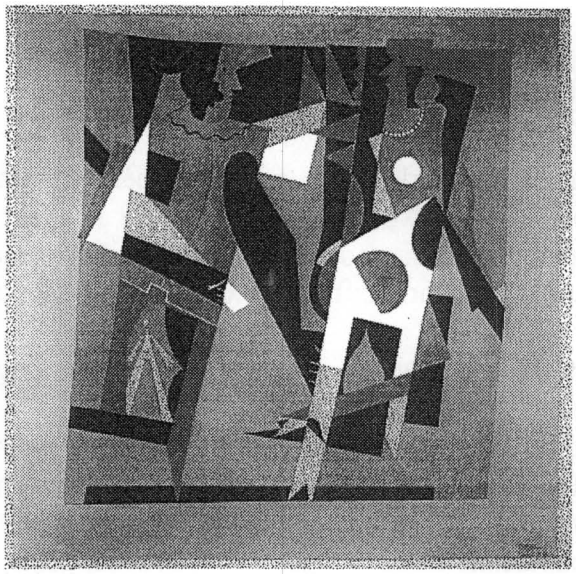
> "The analytical relationships of the objects and the details of their subordination one to another are henceforth of little importance, since they are left out of the picture as painted. They appear later, subjectively, in the picture as 'thought' by the individual who sees it." (1910; 1966: 62)

5.6.4 Synthetic Cubism (1912-1914)

The so-called synthetic phase of Cubism is characterized by the reassembly – or synthesis – of the disassembled subject matter; a more liberal use of colour and texture; the acknowledgement of the canvas as a two-dimensional entity; and the incorporation of extraneous material into the painterly composition. Synthetic Cubism was initiated in September 1912 with the advent of the novel pictorial technique known as "collage" – a term derived from the French verb *coller* (to paste).

Braque, concerned that their stylized compositions would loose all contact with the phenomenal, started to emphasize the tactile propensity of his subject matter, initially imitating the graining of wood through conventional brushwork. Inspired by Braque's example, Picasso incorporated a facsimile of the caning of a chair into his famous still-life by that name – the first example of collage in the history of the visual arts (*fig. 5.32*). This gesture not only indicated the presence of the object by metaphorical association, but also eliminated all vestiges of illusionistic space since the pasted pieces of paper (so-called *papier collé*) are concretely and absolutely flat. The artists could indicate whatever spatial relationships they desired by overlapping and juxtaposing different planar components, relying on the cognition of the viewer to reconstruct the two-dimensional ensemble in the third dimension (*figs 5.33-5.34*).

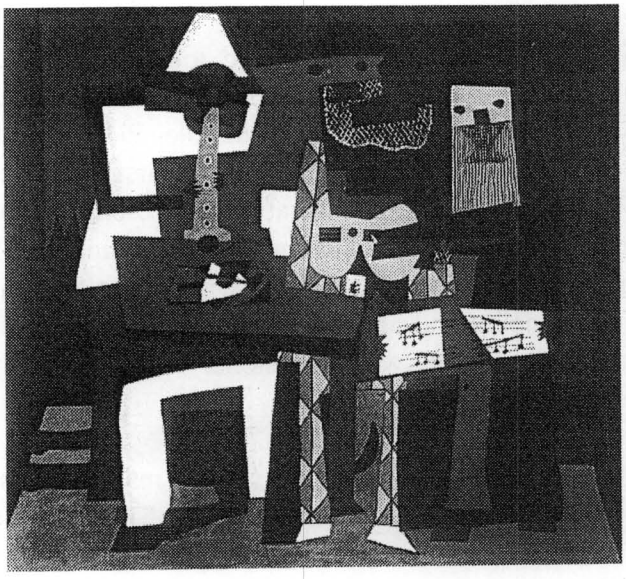
As perspective had been completely dispensed with, the subject matter assumed a compositional and graphic significance that could be explored to the heart's content. The compositional possibilities were endless, least of all due to novel pictorial conventions, including mixed media (*figs 5.35-5.37*). According to Fry (1966: 27-28):



5.38 Crystalline Cubism: Picasso, *Harlequin and Woman with a Necklace* (1917).



5.39 Crystalline Cubism: Picasso, *Pierrot and Harlequin* (1920).



5.40 Crystalline Cubism: Picasso, *Three Musicians* (1921).

> "The artist was now free to compose the strips of paper in a *papier collé* according to a scheme of pattern and colour aesthetically independent of all realistic intent, even while these same coloured or patterned papers conveyed information of the objects depicted."

To summarize in the words of Fry (1966: 38):

> "[Synthetic Cubism] is an ideational notation of forms that were equivalent to objects in the visible world without being in any way illusionistic representations of those objects."

5.6.5 Crystalline (Synthesized, Synthetic) Cubism (1916-1925)

Although the artistic inventory of Cubism had been completed by 1914, some art historians make a further distinction in its chronological development. The crystalline phase of Cubism – so called because of the sudden clarity with which the subject matter was rendered – is often also referred to as the synthesized, synthetic stage of Cubism. This approach manifested during the First World War and was particular to Picasso and Juan Gris (1887-1927), who, as Spanish citizens, were not summoned for military duty. In Picasso's case, this period was a summation of preceding innovations, with *The Three Musicians* (1921) considered its apogee (*fig. 5.40*). In this work, Picasso explored visual parodies, ambiguity, even wit, to great effect. The fact that Picasso designed the décor and costumes for several ballet performances during this period (*figs 5.38- 5.39*), [22] must have precipitated the clarity and highly colourful depiction of his subject matter. According to art historians, the potential of Cubism had been fully realized by 1925, whereupon Picasso pursued different artistic avenues.

5.7 THE ASSIMILATION OF CUBISM

Even though the reputation of both Braque and Picasso had been established for some time, Cubism only started to exert its influence beyond their immediate circle of acquaintances from approximately 1911. It was largely due to the example and initiative of French painter and author Jean Metzinger (1883-1956) that Cubism started to enjoy widespread recognition. Metzinger, acquainted with Picasso since 1908, gradually applied the cubist methodology to his own work. However, just as many of the later adherents who did not participate in its complex evolutionary development, Metzinger's work lacked both the subtlety and accomplishment of the pictorial antecedent (*fig. 5.41*).

Notwithstanding, Metzinger introduced his subjective interpretation of Cubism to a diverse range of Parisian artists. These included Duchamp, Léger, Robert Delaunay (1885-1941), Albert Gleizes (1881-1953) and Henri le Fauconnier (q.v.), all of whom adopted, to varying degrees, the novel cubist idiom and its distinctly aspectival mode of pictorial rendering (*figs 5.42-5.43*). Metzinger was also responsible for the first book on the topic, co-authored with Gleizes and published in 1912. Although subsequent authors regard the *Du Cubisme* as an oversimplified summary of the supposedly cubist principles (listing simultaneity as its chief characteristic), the publication contributed significantly to the global application of reductive methodology of Cubism. Fry (1966: 112) is of the opinion that *Du Cubisme* "all too easily became a manual for the numerous mediocre artists who were soon to form what might be called a school of academic cubism".

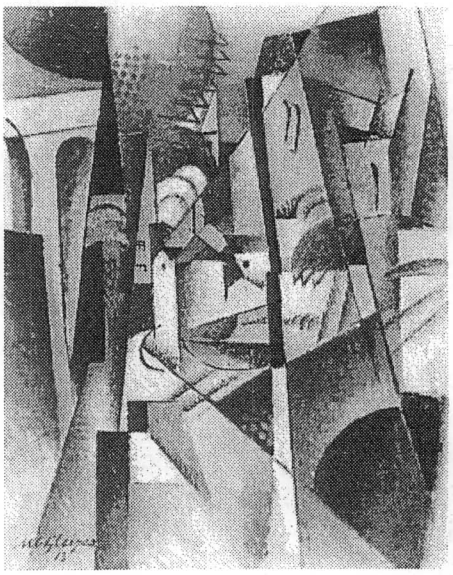
The consecration of Cubism resulted also from extensive journalistic coverage that coincided with the first of a series of Parisian exhibitions hosted at the Salon des Indépendents and Salon d'Automne in July and November 1911, respectively, culminating in the famous "Section d'Or Exhibition" hosted at

---

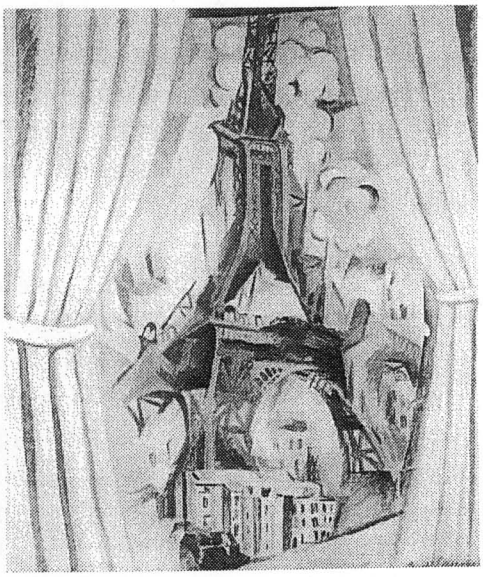
22 It is noteworthy that Picasso intermittently designed décor and costumes from 1917 until the mid-1920s for the Russian Ballet company directed by Serge Diaghilev (1972-1929).



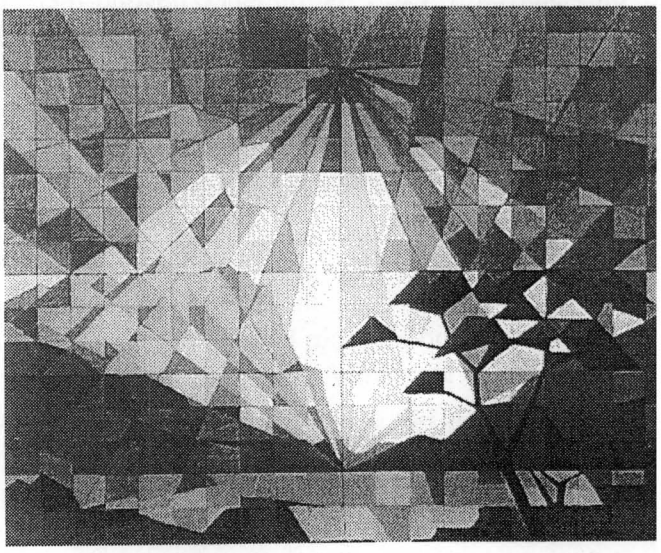
5.41 Metzinger, *Portrait of Albert Gleizes* (1912).



5.42 Gleizes, *Landscape* (1913).



5.43 R. Delaunay, *The Eiffel Tower Framed Between Curtains* (1911).



5.44 Pierneef, *Komposisie – Geometriese Landskap* (1928).

the Galerie de la Boëtie in 1912. It was during the first of these exhibitions that the term "Cubism" gained currency in the local press and became synonymous with French avant-garde painting. The interest and public outrage that these events caused, signalled a decisive break with all past representational conventions. Léger (1914; 1966: 136-136) refers to "All the painters who have collided with public opinion in the last few years have sacrificed subject to pictorial effect". These exhibitions assembled an assortment of contemporaneous artists, many of whom were erroneously labelled Cubists on grounds of their participation instead of their artistic approach. It was only some time later that more definitive academic distinctions could be made. However, neither Picasso nor Braque ever participated in any of these pioneering cubist exhibitions. [23] As a result, Metzinger, Gleizes, Léger and Le Fauconnier were for a considerable time regarded as the leading proponents of Cubism. As art critic Michel Puy (1878-q.v.) noted at the time:

> "Cubism is, at it were, the culmination of the work of simplification undertaken by Cézanne and continued by Matisse, then by Derain ... It is said to have begun with the work of M. Picasso, but as a painter he rarely exhibits his work, its evolution has been observed chiefly in M. Braque." (1911; 1966: 65)

In addition to these local exhibitions, several were held abroad, as far afield as London, Moscow and NewYork. [24] As the new aesthetic dimension differed so radically from anything produced before, numerous artists felt compelled to provide written explanations of their new artistic insights, coupled with several public lectures. [25] Translations of *Du Cubisme* into English, Russian and Czech during 1913 also contributed significantly to its widespread assimilation. Due its tremendous conceptual and compositional possibilities, Cubism stimulated an unprecedented artistic response. By the eve of the First World War, Cubism had exerted such an overwhelming global influence that it was embraced as the dominant pictorial idiom of the 20th century. Even renowned South African artist Jakob Hendrik Pierneef (1886-1957) adopted the cubist methodology, which he consistently applied to his landscape paintings from 1926 (*fig. 5.44*).

The artists who are generally regarded as its most authentic proponents include, beside Picasso and Braque, Léger, Gris, Metzinger, Gleizes and Le Fauconnier. Marginalized figures, such as Delaunay, Duchamp, Jaques Villon (1875-1963), André Lhote (q.v.), Roger de la Fresnaye (1885-1925) and Louis Marcoussis (1887-1941) are also sometimes cited as pioneering cubists painters.

The creative impetus unleashed by Cubism came to an abrupt halt with the outbreak of the First World War. Although the concentrated energy was dispersed after the war, the dominating influence of Cubism persisted and remained discernible in the emergence of all further artistic developments of this century.

5.8 CRITICISM AND DEMISE

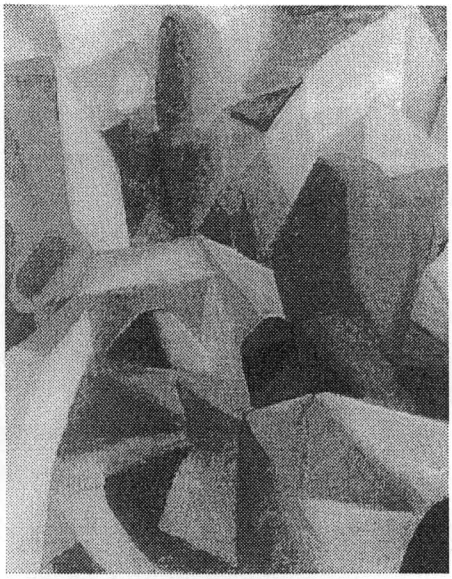
Contemporary art historians are eminently critical of most of the work produced by the cubist adherents. Not having participated in the evolutionary sequence of Cubism, the majority of its

---

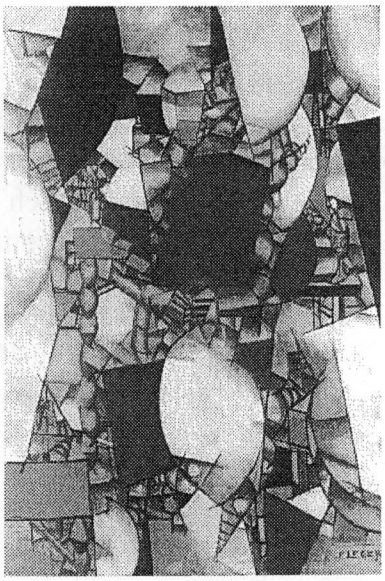
23 Cooper and Tinterow, 1983, *The Essential Cubism – Braque, Picasso and Friends 1907-1920*, exhibition catalogue (London: Tate Gallery), 16, maintain that due to the hostile reception by art critics both Picasso and Braque refused to participate in any of these seminal cubist exhibitions. Apart from Braque's inaugural exhibition hosted at Chez Kahnweiler in 1908, he participated in only one other exhibition, hosted at the Salon des Indépendents in 1909. Picasso only exhibited at a number of privately-owned art galleries in Paris.

24 The work of the Cubists had been exhibited abroad from as early as 1910. During the pre-war years, their work had been on show in Budapest, Prague, Berlin, Düsseldorf, Munich, Barcelona, Florence, Chicago and Boston.

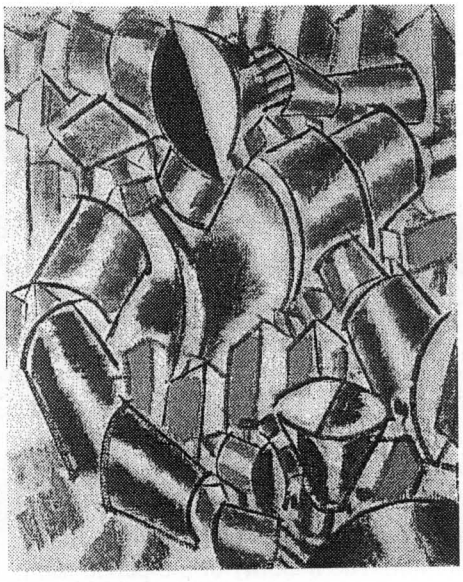
25 Beside Metzinger and Gleizes, Léger, too, was a prolific and eloquent author. The majority of the public lectures at the time were given by art critics who were often associated with the major Parisian newspapers, including Apollinaire, Maurice Raynal (1884-1954) and René Blum (q.v.).



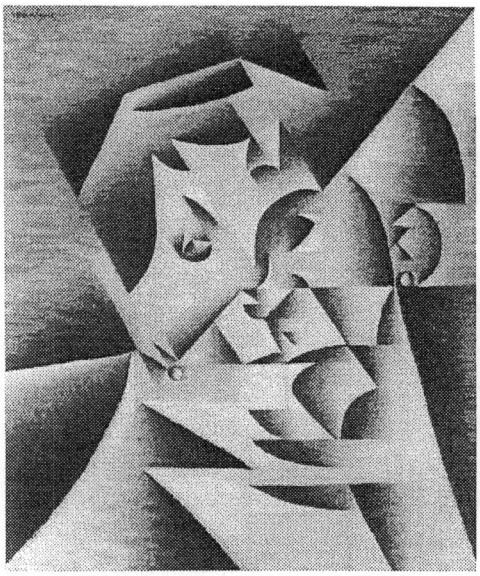
5.45 Léger, *The Bridge* (1909).



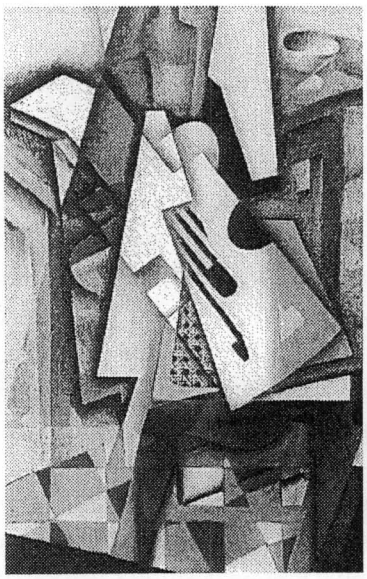
5.46 Léger, *Woman in Blue* (1912).



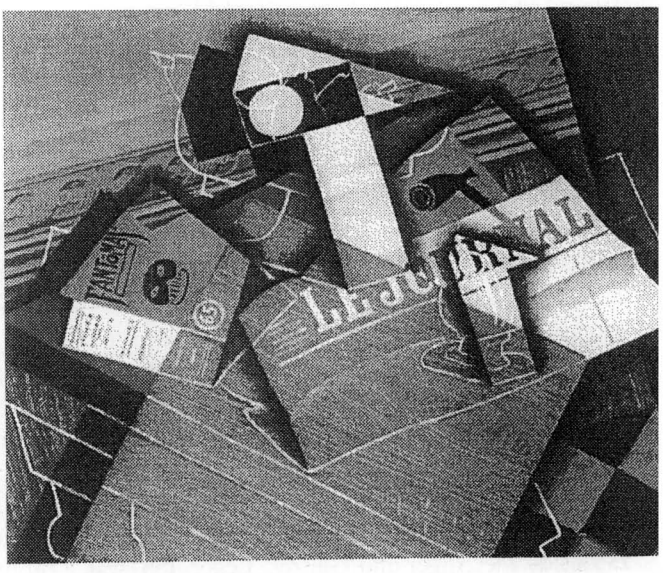
5.47 Léger, *Seated Woman* (1913).



5.48 Gris, *Portrait of the Artist's Mother* (1912).



5.49 Gris, *Guitar on a Chair* (1913).



5.50 Gris, *Fantômas* (1915).

disciples emulated its principles in a highly superficial manner and lacked, more often than not, in understanding and talent. Regrettably, Metzinger, as so many others influenced by his example, reduced a highly complex pictorial process that took Picasso and Braque numerous years to bring to fruition, to a style of painting displaying common characteristics. Just as modern architecture ultimately degenerated into a style (rather than a methodology or a particular mindset), Cubism, in the hands of inept artists, suffered similar consequences. During the prominent retrospective exhibition, "Essential Cubism – Braque, Picasso and Their Friends 1907-1920", hosted at the Tate Gallery, London, in 1983, only Léger and Gris, beside Picasso and Braque, were represented extensively. It is maintained that of all the cubist proponents, only Léger and Gris made any significant contribution to the overall pictorial development of Cubism – incidentally, the two artists to whom Le Corbusier best related.

After being introduced to Picasso's work in 1910, Léger, too, adopted the novel pictorial methodology (*fig. 5.45*), but promptly devised his own version of Cubism. The reduction of his subject matter to cylindrical configurations earned him the distinction as a so-called Tubist – a term coined by Vauxcelles in 1911 (*figs 5.46-5.47*). [26] In time, the constrasting properties of line, form and colour surpassed the semiotic content of his initial figurative subject matter. Due to this pursued interest, eloquently formulated as "Multiple Contrasts" (1914), [27] his work dating from 1913 is closer to the abstract intentions of the Orphists, as identified by Apollinaire, [28] than the orthodox Cubism practised by Picasso and Braque. Unlike his predecessors and concurring with the preoccupations of the Futurists, Léger was enamoured with the dynamics of the modern existence, which he conveyed in his paintings and echoed in his writings:

> "It is certain that the evolution of means of locomotion, and their speed, have something to do with the new way of seeing ... Now the railway trains and automobiles, with their plumes of smoke or dust, take all the dynamic quality for themselves, and the landscape becomes secondary and derivative ..." (1914; 1966: 135-136)

Léger also used the machine as subject matter, exploring mechanomorphic shapes and forms that materialized via the cubist process of fragmentation and reassembly.

By contrast, Gris's pictorial development was much closer to that of Picasso and Braque. Due to his Spanish heritage, Gris probably made Picasso's acquaintance soon after his arrival in Paris in 1906. His work also progressed from a distinct Cézannian phase to a monochromatic, analytical stage that was surpassed by the synthesis of the fragmented subject matter (*figs 5.48-5.50*). He furthered Picasso and Braque's interest in collage and even incorporated reflective and transparent material, arguing that no painterly technique could ever achieve the same affect. However, the single most important aspect that sets Gris apart from Picasso and Braque was his attention given to the organization of his compositions according to classical numerological systems. [29]

---

26 According to Fry (1966: 100), Vauxcelles' denotation of Leger's work appeared in an unspecified article in the Parisian newspaper *Gil Blas*, dated 30 September 1911.

27 See Léger, F., 1913, "The Origins of Painting and its Representational Value", *Montjoie!*, no. 8; reprinted in Fry (ed.), 1966, *Cubism*: 121-126).

28 With reference to Apollinaire's contentious distinctions made after viewing the diverse interpretations of Cubism on display at the "Section d'Or Exhibition" in 1912, which he qualified in *Les Peintres Cubistes*. See next chapter for the topic entitled "Orphism".

29 It is noteworthy that Gris was not the only artist to pursue the numerological connection between cubist painting and composition. The members of the so-called Groupe de Puteaux – initiated by the Duchamp-Villon brothers together with Metzinger, Léger, Apollinaire, Salmon, Delaunay, Maré, and various others – formed the nucleus of the theoretical component of Cubism (in addition to organizing the "Section d'Or Exhibition"). They were infinitely preoccupied with rationalizing Cubism on grounds of elaborate mathematical and philosophical precepts – including the renowned space-time conjecture – and also investigated the correspondence between abstraction, mathematics and music. Banham (1960a; 1996: 112) describes the Groupe de Puteaux as "notoriously mathematical and philosophical".

These mathematical deliberations contributed significantly to the visual equilibrium that Gris's work exudes and which appealed, particularly, to the aesthetic sensibilities of Le Corbusier. Not only did his use of colour support the organizational structure of his compositions, but he respected the integrity of his subject matter to a far greater degree than did Picasso and Braque. As a result, the reductive process and its conceptual point of departure is far more discernible, making his work accessible to the public and critics alike.

Apart from the retrospective criticism levelled at the work produced by the majority of the cubist proponents, the movement had come under attack as early as 1912. The Italian Futurists maintained that Cubism was far too static, and that the transcendental experience of movement was not communicated literally enough. [30] They were also of the opinion that the triumvirate of Cubism – Braque, Picasso and Gris – did not convey the dynamics of modern existence satisfactorily – a criticism shared, in due course, by the Purists. In turn, the subsequent abstract artists were critical of the fact that the mentioned Cubists never relinquished their ties with the phenomenological (Spate 1980; 1991: 97). Despite these criticisms, it cannot be denied that Cubism presented such a wide range of creative possibilities that different artists could imbue this novel aesthetic enterprise with their particular interests and agendas, as they indeed did.

After the end of the First World War and independent of Picasso, Braque made a concerted effort to reinstate Synthetic Cubism and launched a highly personalized version thereof with distinct fauvist qualities. Gris continued to pursue the crystalline properties of this later phase of Cubism until his untimely death in 1927. Léger's abstract period was in time surpassed by a renewed interest in the figurative, but imbued with surrealist connotations. Evidently, Picasso never considered Cubism an end in itself. Just when it had become so, he started exploring different artistic avenues. Picasso participated in the first surrealist exhibition hosted at the Galerie Pierre, Paris, in 1925, abandoning the intrinsic premises on which Cubism was founded. He never, though, relinquished his commitment to the semiotic or the figurative and continued to employ the stylized pictorial idiom synonymous with Cubism throughout his life. To quote Fry (1966: 35):

> "The expressive intensity of his blue period and of *Les Demoiselles d'Avignon*, which had for so long been suppressed or sublimated in a long series of brilliant formal inventions, emerged with his *Three Dancers* of 1925, never again completely to disappear. With this work, cubism as a living style came to an end, although both Picasso and virtually every other artist of the next four decades remained indebted in one way or another to what is still today the greatest single aesthetic achievement of the century."

5.9 CUBISM, IN CONCLUSION

Cubism is the generic name given to the varied range of work produced between 1907 and 1925 that mimicked Picasso's pioneering example of severing all ties with the classical, illusionistic pictorial tradition. Cubism, intrinsically a formalistic art (pursuing the formal properties of the subject matter), entailed the contrivance of radically new artistic conventions and procedures, incorporating also the act of creation as part of the subject.

---

30 According to Chipp (1968: 281), the first attacks on Cubism by the Futurists appeared in the Florentine publication *Lacerba* from approximately 1911 (despite the fact that the Futurists were entirely endebted to the Cubists with regard to the pictorial treatment of their subject matter – see Chapter 6). The first major futurist exhibition hosted at Galerie Berheim-Jeune, Paris, on 5 February 1912, highlighted the difference in ideological approach between these two aesthetic initiatives.

There is consensus amongst art historians that the artistic intentions of the Cubism practised by Picasso and Braque were 'realistic', since the extent to which the semiotic content of the subject matter could be conveyed conceptually, remained their principal preoccupation. Therefore, despite the fact that their cubist reconstructions constituted new perceptible realities, they remained grounded in the phenomenological – in stark contrast to the abstract artists who relinquished all ties thereto. According to later artistic developments, Picasso and Braque are not considered abstract artists. Notwithstanding, these two artists were entirely responsible for introducing the self-conscious act of abstraction to Western art.

Due to both the novelty and the complexity of Cubism, a host of definitions have been offered, frequently finding justification in the then-prevailing industrial *Zeitgeist*, and the revolutionary techno-scientific innovations synonymous with the late 19th and early 20th centuries. According to Gris (1925; 1968: 276-277), Cubism was "simply a new way of representing the world ... inevitably connected with every manifestation of contemporary thought ", to which Léger (1914; 1966: 135) added that "if pictorial expression has changed, it is because modern life made this necessary".

5.10 SUMMARY

This chapter traced the genesis of Cubism and examined the far-reaching conclusions drawn from the most important visual document of this century, *Les Demoiselles d'Avignon*, produced by Pablo Picasso between 1906 and 1907.

Attention was given to the three major influences that spawned this painting's conception, namely, Fauvism, African art, and the work of the Post-Impressionist, Paul Cézanne. The Fauves not only introduced Picasso to African art, but their exaggerated mode of drawing, distorted perspectival procedures and non-representational use of colour contributed significantly to the shaping of his aesthetic sensibilities. Since African art performed a completely different task to that of the classical European model, creative expression was approached from alternative premises – hence its reductive and metaphorical modes of visual communication. Picasso was the first Western artist to realize that the conceptual content of the unselfconscious tradition could assist in liberating the customary perception of art from its conditioned responses and associations. In turn, Cézanne's particular treatment of form and application of colour served as the pictorial precedent for conveying the volumetric credibility of an object without resorting to conventional illusionary procedures.

Les Demoiselles d'Avignon bears evidence of an uncanny process of physical and painterly transformation, most vividly demonstrated in the distorted squatting figure that defies all physical and optical probabilities. This painting, firstly, drew attention to the fact that the depicted does not have to conform to naturalistic conventions in order to be recognized as such. Secondly, the conceptual point of departure can justify the artistic act and validify its existence as a work of art. Thirdly, the ungainly manner of the painting's execution raised important questions about artistic criteria and aesthetic norms, particularly whether art should be reviewed exclusively in terms of beauty and technical excellence. Fourthly, the synthesis of different viewpoints into a single optical experience served as the most dramatic violation of classical pictorial conventions and heralded the self-conscious reversal to the aspectival mode of visual communication. Lastly, Picasso's extraordinary decision to compress what normally occurs in time and through space, magnified the existence of both space and time as autonomous artistic and, ultimately, architectural concepts. Consequently, the conclusions drawn from *Les Demoiselles d'Avignon* challenged all past aesthetic preconceptions and revoked previous artistic preoccupations. Its most imminent impact was that it served as catalyst for the genesis of the autonomous artistic phenomenon known as Cubism.

The evolution of Cubism, resulting from the close collaboration between Picasso and Georges Braque, progressed through five distinct stages. The embrionic Cézannian phase was an extension of Picasso's ardent interest in the manner in which the voluminousness of sculpture could be conveyed pictorially, but without resorting to perspective and *chiaroscuro*. This intrinsically perceptual stage was surpassed by the analytical and hermetic phases whereby the subject matter had been reduced to a series of fragmented planes. Both the voluminousness and the semiotic content of the object were conveyed conceptually and depended on the imaginary reconstruction on the part of the viewer. During the ensuing synthetic stage of Cubism, the fragmented subject matter was reassembled to constitute new perceptible realities and to which the advent of collage greatly contributed. The crystalline phase – predominant in Picasso's work – was a summation of the preceding innovations, but was rendered with a far greater degree of clarity and the liberal use of colour.

Reference was also made to the global assimilation of Cubism. This resulted largely from the initiative of French painter and author Jean Metzinger, and the extensive journalistic coverage that coincided with the hosting of several seminal cubist exhibitions in Paris and abroad. The creative impetus unleashed by Cubism came to an abrupt halt with the outbreak of the First World War, but its dominating influence persisted and remained discernible in all further artistic developments of the 20th century. Artists of ensuing aesthetic initiatives were critical of the fact that the triumvirate of Cubism – Picasso, Braque and the Juan Gris – did not convey the dynamics of modern existence satisfactorily and never relinquished their ties with the phenomonological. Nevertheless, Cubism provided such a wide range of pictorial and plastic possibilities that different artists could imbue this novel aesthetic enterprise with their particular interests and agendas.

CHAPTER 6 THE PICTORIAL DERIVATIVES OF CUBISM

6.1 PREFACE

The cross-fertilization and concurrence of pivotal data haunt any study of modern architecture. Given such difficulty, this chapter serves as a preamble to the volumetric transformation of modern art, introducing those pictorial derivatives of Cubism that established this interface. The chapter commences with Futurism, since its mechano-centricism underpinned much of the theoretical discourse of 20th century architecture. This is followed by a review of the development of non-figurative art, contextualizing the genesis of Neo-Plasticism and the apogee of abstraction, Suprematism.

Cognizance must be taken of the fact that Purism – the least abstract, but modelled most closely on the cubist precedent – emerged when both Futurism and the planimetric stage of Suprematism had already drawn to a close. Hence, attention is directed to Purism before reviewing the transmogrification of Cubo-Futurism, Neo-Plasticism and Suprematism in further chapters.

6.2 INTRODUCTION

The implications of Cubism were of such a magnitude that it directly and indirectly influenced all ensuing aesthetic initiatives of the 20th century. In the words of Chipp (1968: 193):

> "The Cubist movement was a revolution in the visual arts so sweeping that the means by which images could be formalized in a painting changed more during the years from 1907 to 1914 than they had since the Renaissance ... The full implications of this revolution, however, were only realized later, when the influence of its ideas upon ensuing movements in painting and sculpture, some of them quite different in character from Cubism, was seen."

There is not a single art movement that emerged before the First World War, or subsequently, that cannot trace its origins to some aspect touched upon by Picasso and Braque during the embrionic years between 1907 and 1914. An excerpt from an article that appeared in *Time* (Hughe, 1989: 58) is a poignant homage to Cubism:

> "Practically all later styles of 20th century painting and sculpture can be identified through either their origins in Cubism or their opposition to it. Abstract art comes out of the virtual disappearance of the recognizable nude or still life from Braque and Picasso's work. Pop art is born in the letters, headlines and brand names they glued onto the surfaces. Constructivist sculpture descends from Braque's paper constructions and Picasso's tin guitar. Abstract Expressionism, the escape from the Cubist grid. Cubism becomes the tree in the primal garden of modernism, and Picasso and Braque its Adam and Eve."

In view of these above-mentioned assertions, the following summary serves as a synoptic account of, but only, the pictorial implications of this remarkable artistic phenomenon:

1. The reductive methodology and its novel treatment of form provided the diverse range of contemporaneous artists with a stylistic means to either expand their existing artistic repertoire, or to further their specific interests and concerns.

2. Since Cubism had indicated that artistic expression does not have to be defined in terms of mimetic representations, the artistic emphasis had shifted from perceptual depictions to conveying conceptual intentions.

3. The revolutionary artistic inventory spawned by Cubism enabled 20th century artists to express more adequately in visual terms the complexities of the human condition and the perplexing pathologies of a modern existence.

4. The cubist innovation of simultaneous depiction, the implied sense of movement and space-time paradigm not only coincided with prevailing scientific theories, but also concurred with latter-day inventions – X-Rays, chronophotography, electricity and the automobile – factors that collectively contributed to reinforce the actuality of a non-representational mode of visual expression.

5. The spatial and kinetic content of Cubism spawned a particular interest in novel topics, such as, speed, motion velocity, gravity, space and even non-Euclidean geometry, that were ultimately explored as autonomous subject matter.

6. The sudden credibility of the two-dimensional, rekindled consideration of the compositional distribution of the pictorial content – whether based on intuition, psychology, mathematical principles or musical premises.

7. The conceptual implications of Cubism led to the expansion of artistic subject matter way beyond the norm, and synthesized – apart from architecture – a vast range of academic disciples never previously associated with the visual arts.

8. Most importantly, Cubism was the catalyst for the development of abstract (or non-figurative) art – a pictorial idiom particular to the 20th century.

6.3 KINETIC CUBISM: FUTURISM (1909-1916)

6.3.1 Futurism as Cubist Derivative

The qualification of Futurism as a derivative of Cubism is a topic of dispute. Futurism, the most radical celebration of industrialization and 'mechanolatry', was in many instances unique amongst the pioneering modern movements. Norbert Lyndon concedes (1991: 96):

> "It was Italian. It originated in a view of civilization and found expression first in words; rather than spring from some dissatisfaction with inherited idioms of art and from an ambition to create a new idiom; it started with a general idea and found artistic expression only with difficulty. In some ways it was the most radical, noisily rejecting all traditions and time-honoured values in institutions. It propagated its ideas very rapidly throughout Europe, from London to Moscow, and it was short-lived – a meteoric episode, the lasting importance of which has usually been underrated. It chose its own name – unlike movements like Fauvism and Cubism which were dubbed by antagonistic critics – and went to great lengths to provide its own rationale in literary form ..."

Yet, all evidence points to the fact that Futurism was a calculated (albeit inherently nationalistically-motivated) response to the aesthetic revolution that emerged in France, with the bombastic rhetoric of its authors symptomatic of their frustration at the dearth of any Italian contribution in this field (Lynton, 1919: 98). More importantly, and despite their elocution, the Futurists were only able to convey effectively their radical conceptual intentions after a first-hand encounter with Cubism in Paris in 1911. It was only once they had adopted the cubist reductive methodology and technique of

simultaneity (though combined with the colour divisionism developed by the Neo-Impressionists), that they were able to evolve a satisfactory pictorial idiom that matched the fervour of their revolutionary exaltations. Banham (1960a; 1996: 109), a greater advocate of Futurism than Cubism with respect to their impacting roles on Heroic Modernism, does admit:

> "The contact with [Braque, Picasso and the rest of the Cubist circle] had a galvanic effect on the Futurists and uncertainty as to the appearance of their painting disappeared, they took over from the Cubists a repertoire, a *linguaggio*, of formal devices and surface treatments and turned them to their own ends."

He (*ibid.*) adds, though:

> "That those ends were not those of Cubism needs to be emphasised ... Cubism stood at the end of a long reformist tradition that runs through Cézanne towards Courbet ... Its aesthetics when they came to be written were traditionalist and academic, and in no way as revolutionary as those of Futurism – chiefly because Cubism was a revolution within painting itself, and not part of a profound reorientation towards a changed world."

Banham (*ibid.*: 110) posits that "the Futurists' interest in the dissolution of bodies antedates their encounter with Cubism by over a year. Their interest in the dismemberment of forms was their own; it was a method for doing it which they picked up in Paris. Their interest in bodies in motion was their own, it was a convention for representing motion which they learned from the Cubists." However dismissive Banham (*ibid.*) may be of the "intuitive and quasi-representational approach of Picasso and Braque", this thesis contests his views on grounds of the fact that the virtual mobility of Picasso's *Les Demoiselles d'Avignon* precipitated all other kinetic explorations in the pictorial arts. It is therefore – coupled with the formal and conceptual contributions of Cubism – plausible to qualify Futurism as one of its many derivatives.

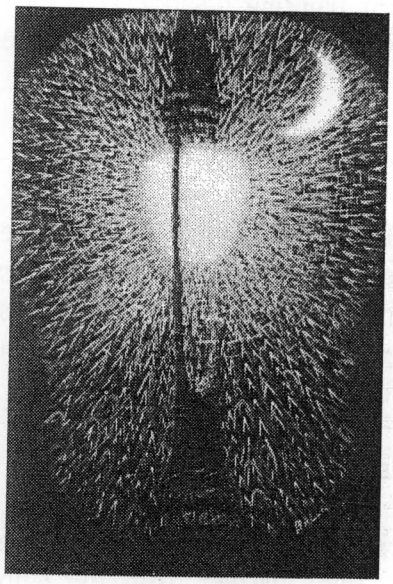
6.3.2 Historical Overview

As noted, Futurism was a brief aesthetic movement that originated in Italy, pre-empted by the manifesto "Le Futurisme" written by poet Filippo Marinetti (1876-1944) in 1909. [1] Its anarchist content extolled the virtues of mechanized energy, celebrated the dynamics of speed and motion, glorified war, deplored feminism, and called for the abolition of academic institutions and the demolition of historical edifices:

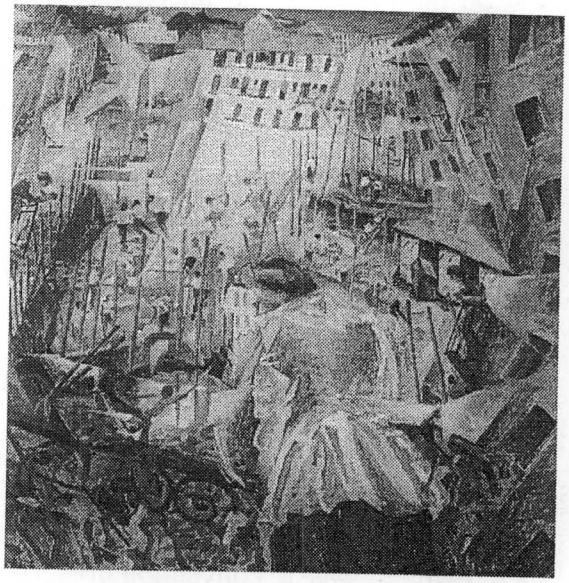
> "We declare that the splendour of the world has been increased by a new beauty: the beauty of speed. A racing car, its body ornamented by great pipes that resemble snakes with explosive breath ... a screaming automobile that seems to run on grapeshot, is more beautiful than the *Winged Victory of Samothrace* ... We want to glorify war – the world's only hygiene – militarism, patriotism, the destructive act of the anarchist, the beautiful ideals for which one dies. We want to destroy museums, libraries, and academies of all kinds, and to make war on moralism, feminism and on every opportunistic and utilitarian vileness ... We launch from Italy into the world this our [*sic*] manifesto of overwhelmingly and incendiary violence, with which today we found Futurism, [*sic*], because we want to liberate this land from the fetid cancer of professors, archeologists, guides and antiquarians." (Lynton, 1991: 98)

---

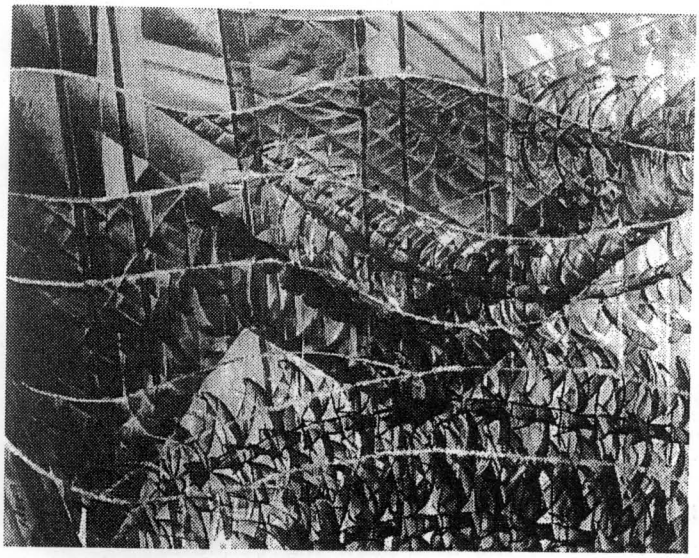
1 "Le Futurisme" was actually a preface to an anthology of Marinetti's poems. According to Lynton, N., 1991, "Futurism", in Stangos, N. (ed.), *Concepts of Modern Art* (London: Thames & Hudson), 97, Marinetti also considered "Dynamicism" and "Electricity" as possible titles.



6.1 Futurism: Balla, *The Street Light* (1909).



6.2 Futurism: Boccioni,
Street Noises Invade the House (1911).



6.3 Futurism: Balla, *Swifts:*
Paths of Movement and Dynamic Sequence (1913).



6.4 Futurism: Severini,
Dynamic Hieroglyph of the Bal Tabarin (1912).

Marinetti's exhortations were embraced by the young artists, Umberto Boccioni (1882-1916), Luigi Russolo (1885-1947), Carlo Carrà (1881-1966), Giacomo Balla (1871-1958) and Gino Severini (1883-1965). The earliest initiates, Boccioni, Russolo and Carrà (and possibly Balla), jointly prepared the first of a series of futurist manifestoes, entitled "Manifesto della Pictura Futurista", dated February 1910, in which they denounced traditional art and demanded a contemporary mode of artistic expression. This was followed by Boccioni's technical version, "Manifesto Tecnico della Pictura Futurista" of April 1910, which eulogized speed, motion and energy, and were considered the artistic subject matter of the future. A typical extract reads:

> "Everything moves, everything runs, everything turns rapidly. A figure is never stationary before us but appears and disappears incessantly. Through the persistence of images on the retina, things in movement multiply and are distorted, succeeding each other like vibrations in the space through which they pass." (Lynton, 1991: 99)

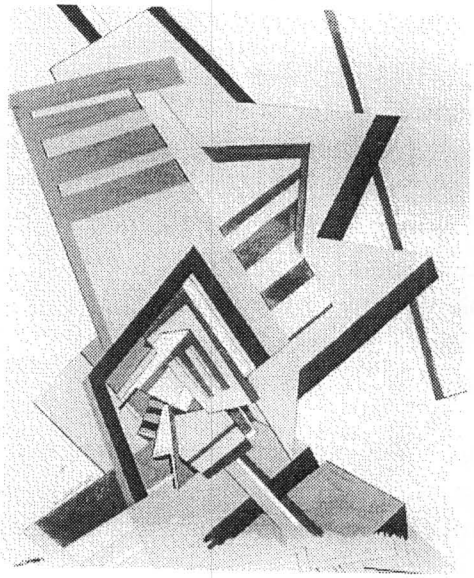
There is more in the same vein, but no description as to how these kinetic sensations were to be depicted, other than employing the technique of pointillism. Although their embryonic attempts, such as Balla's *The Street Light* (1909, *fig. 6.1*) and Boccioni's *Street Noises Invade the House* (1911, *fig. 6.2*), were executed in a neo-impressionist mode, recalling also the formal distortions of the Fauves, the discrepancies between their temperate pictures and revolutionary exclamations were conspicuous. At Severini's instigation, the Futurists visited Paris, familiarized themselves with the latest developments in Cubism, and promptly devised a pictorial vehicle suitable for their pursuits. Upon their return to Italy, they eminently prepared an epic body of work that was triumphantly shown at the Galerie Berheim-Jeune in Paris in February 1912, and subsequently in the rest of Europe, England and the Soviet Union. This seminal exhibition, bolstered by public lectures and 'happenings', won them a considerable following and spawned a host of futurist initiatives.

Their artistic output was varied, both in terms of interest and ability. Their work also became increasingly abstract in concurrence with prevailing tendencies. Balla specialized in optical sensations, culminating in kinetic abstractions (*fig. 6.3*). Carrà and Severini, in turn, experimented with iridescent simultaneous depictions, fusing futurist subject matter with cubist techniques (*fig. 6.4*). Russolo's seminal contribution was in the musical arena, with his bizarre noise compositions, *The Awakening City* and *The Meeting of Aeroplanes and Motor-cars*, causing a furore at the time. Boccioni, considered the most gifted and innovative, excelled as a sculptor and dedicated his "Manifesto Tecnico della Scultura Futurista" of 1912 to a novel range of materials that invigorated the plastic arts and with far-reaching consequences in the architectural arena.

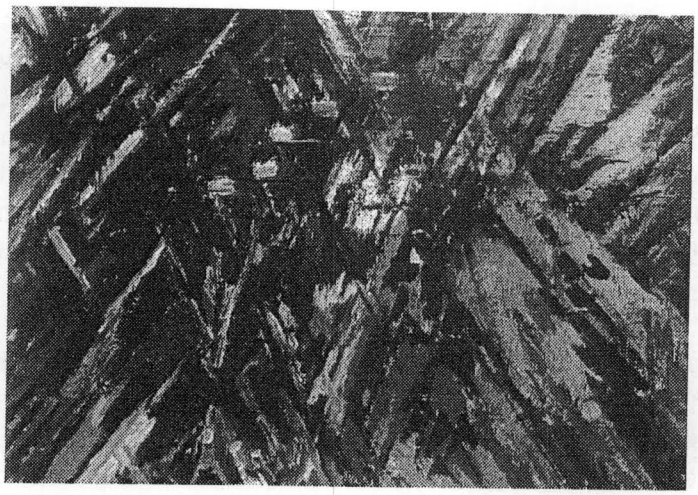
Marinetti's visionary projections also elicited an architectural response, culminating in a blue-print for futurist architecture. The movement's most celebrated architect, Antonia Sant'Elia (1888-1916), together with colleagues Mario Chiattone (1891-1957) and Ugo Nebbia (q.v.), launched an architectural initiative entitled Nuove Tendenze in 1912. At their first exhibition in Milan in April 1914, Sant' Elia's renowned drawings of the Città Nuova were shown, illustrating Marinetti's lyrical descriptions of the industrialized metropolis. The publication of the controversial "Manifesto dell' Architettura Futurista" followed some three months later. [2]

---

2 Sant'Elia's association with Futurism is contentious as some scholars maintain that the Nuove Tendenze was initiated independently from any futurist input. Moreover, Sant'Elia's manifesto on architecture – a revision of the preface ("Messaggio") of the Milan exhibition catalogue – is said to have been altered by Marinetti (assumingly after Sant'Elia's death) to reflect his own views, rather than those of Sant'Elia (or Nebbia, whom some claim to have written the manuscript in the first place – though at Sant'Elia's instigation). Banham, R., 1960a; 1996, *Theory and Design in the First Machine Age* (Cambridge, Massachusetts: MIT Press), 127, on the authority of Italian academic Alberto Sartoris, is adamant that Sant'Elia was "in touch" with the Futurists since 1912, and that his visionary drawings were indeed an architectural interpretation of Marinetti's vivid descriptions of the industrialized metropolis. According to Banham (*ibid.*: 128, footnote 2), Sant'Elia's stigmatized affiliation with the Futurists was contested on political grounds, rather than factual information.



6.5 Vorticism: Edward Wadsworth (q.v.), *Abstract Composition* (1915).



6.6 Rayonism: Mikhail Larionov (1881-1964), *Rayonist Composition: Domination of Red* (1914).



6.7 Synchronism: Stanton MacDonald-Wright (1890- 1973), *Abstraction on Spectrum [Organisations]* (1913).

By 1915, Marinetti and his disciples had committed themselves to a political futurist manifesto, "Italian Pride", in support of Fascism. However, the collective energy of Futurism came to an abrupt end in 1916 when the lives of Boccioni and Sant'Elia were claimed, in Marinetti's words, by "the world's only hygiene". All attempts to resuscitate the movement after the First World War failed dismally, with only Enrico Prampolini, a later affiliate, persisting in a futurist idiom.

6.3.3 The Futurist Legacy

The Futurists' most immediate impact was evidenced by the kinetic experiments of the Orphists (1911-1914), who, in turn, informed the Futurists' development towards abstraction. Futurism spawned a further number of so-called cubo-futurist initiatives – the English enterprise, Vorticism (1912-1915, *fig. 6.5*), the Russian movement, Rayonism (1913, *fig. 6.6*), and the American equivalent, Synchronism (1913, *fig. 6.7*) – in addition to their more lasting influence on Suprematism (1913-1935) and Constructivism (1917-1932).

The Futurists' insistence on a latter-day means of aesthetic expression had long been voiced, but never had it been communicated as insolently in both literary and pictorial terms. As Lynton noted, the Futurists went to great lengths to substantiate their intentions, and the manifesto tradition is credited to them. From an architectural point of view, their pictorial endeavours were less important, apart from the engendered interest in motion and related dynamic propensities. Their seminal contributions were, firstly, in the plastic arts and, secondly, in the field of architectural theory.

Marinetti's glorifications of mechano-centricism and the lauded machine aesthetic were reiterated by all the proponents of Heroic Modernism. Sentiments similar to these expressed by him in the "Manifesto of Geometrical and Mechanical Splendour, and the Sensibility of Numbers" (March 1914) would be echoed consistently throughout the 1920s and early 1930s:

> "Nothing is more beautiful than a great humming power-station, holding back the hydraulic pressures of a whole mountain range, and the electric power for a whole landscape, synthesized in control-panels bristling with levers and gleaming communicators." (Banham, 1960a; 1991: 125)

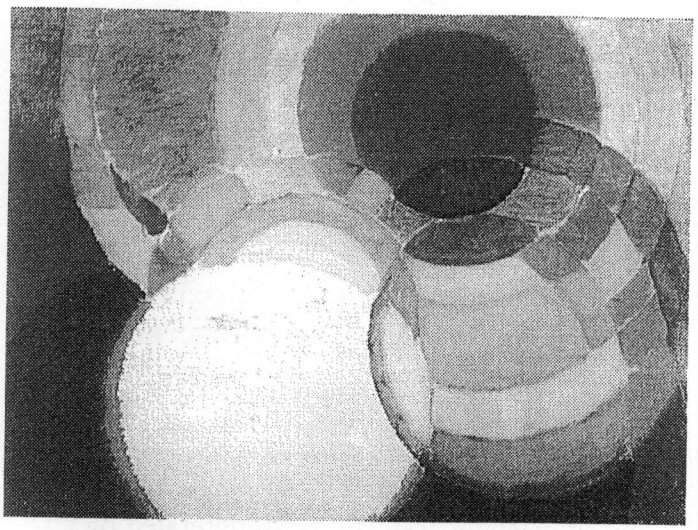
In the same work, Marinetti (*ibid.*) calls for the virtues "order", "discipline", "method", "conciseness" and "harmonious precision". The significance of these aesthetic conditions, and the implied analogy between "geometry" and "mechanical splendour", were promptly furthered in the writings of Severini.

Already prior to the dissipation of Futurism, Severini had been close to the Parisian Groupe de Puteaux, the theoretical nucleus of Cubism and renowned for their extravagent mathematical and philosophical conjectures. Severini subsequently started to developed a more abstract notion of mechanization, and posited his influential neo-Platonic theory on the correlation between art and technology. In his seminal essay "Le Machinisme et l'Art Reconstruction de l'Univers" (c. 1917), [3] Severini contended that the "The construction of the machine is analogous to art ... we may conclude that the effect produced in the spectator by the machine is analogous to that produced by the work of art" (Banham, *ibid.*: 152). His views found support in Plato's much-quoted extract from the *Philebus* [4] in which Plato (via Socrates) presupposes that certain geometric configurations and, by implication, manufactured objects encapsulate universal beauty:

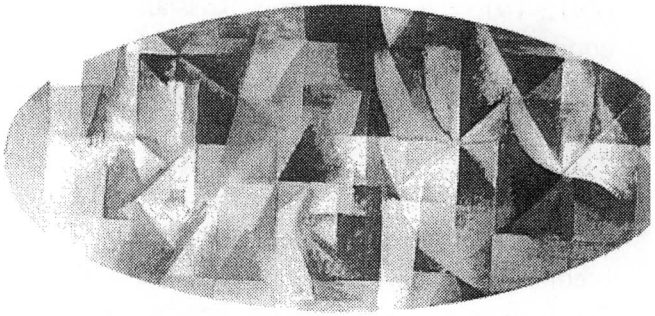
---

3 It is not clear when this article was first written. Banham (1960a; 1996: 205) only states that it was published in both the *Mercure de France* and in *De Stijl* in 1917. It is highly likely that it was a "post-futurist" publication.

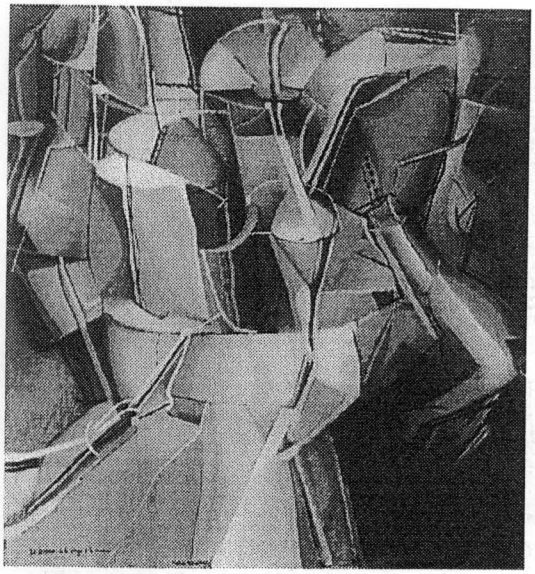
4 Banham (*ibid.*: 205) draws attention to the fact that since 1911 this particular quotation had been cited on several occasions in press with respect to Cubism, Futurism and abstract art.



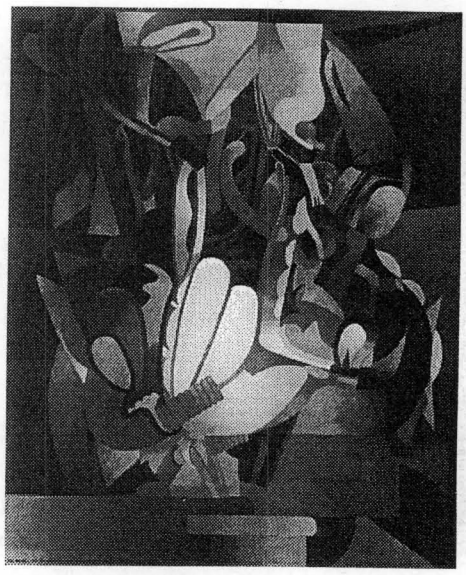
6.8 Orphism: Kupka, *Discs of Newton* (1911-1912).



6.9 Orphism: R. Delaunay, *Windows Open Simultaneously, 1st Part, 3rd Motif* (1912).



6.10 Orphism: Duchamp, *The Passage from the Virgin to the Bride* (1912).



6.11 Orphism: Picabia, *I See Again in Memory My Dear Undie* (1914).

> "... understand me to mean straight lines and circles, and the plane geometry or solid figures which are formed out of them by lathes, rules and protractors; for these I affirm to be ... eternal and absolute beautiful." (Banham, 1960a; 1996: 205)

The adoption of classicizing predilections of this nature and the stylistic rejection of Classicism is disturbingly paradoxical. Yet, the Platonic rationale of an idealized mechanolatry was to form the basis of much of the modern aesthetic debate and expression – with abstract art the epiphany of these Platonic presuppositions; of universal absolutes.

6.4 THE NON-FIGURATIVE PROPENSITY OF CUBISM: ABSTRACT ART

6.4.1 Introduction

By 1910, at the zenith of the hermetic stage of Cubism, the compositions of Picasso and Braque had reached such a deductive state that without the accompanying title the content would be indiscernible. Yet, despite the tenuity of the phenomological, both artists continued to pursue the psychological impact existing between apparent abstraction and alluded representation. With the exception of Purism, the phenomenological character of Cubism found little support. Instead, it was its conceptual content, reductive methodology and geometric tendencies that captured the attention, and were pursued to their logical conclusions. It is therefore no coincidence that the first experiments with non-figurative art date from 1910 and were conducted concurrently by several European artists.

Abstract art is the generic term for the non-figurative, or supposedly non-representational, [5] mode of artistic expression that transpired as a result of the Cubists' novel treatment of form. On the one hand, abstract art pertains to the process by which identifiable subject matter is simplified, modified or altered, so as to bear only a stylized resemblance to the originating source. On the other hand, as an artistic phenomenon exclusive to the 20th century, it embraces those art movements that self-consciously evolved a non-naturalistic formal language that bears no relation whatsoever to the visible world.

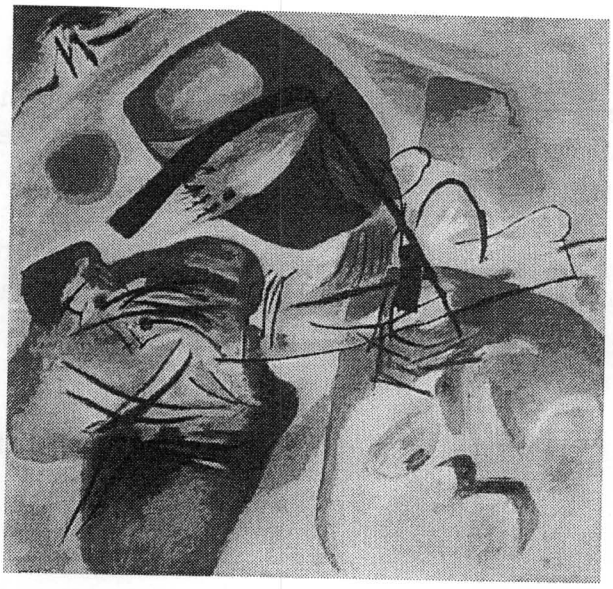
Due to the prominent role that this derivative of Cubism played in 20th century art, coupled with its ties with modern architecture, the evolution of abstract art requires scrutiny, tracing the genesis of Neo-Plasticism and Suprematism via the pioneering endeavours of the Orphists and Expressionists.

6.4.2 Orphism (1911-1914)

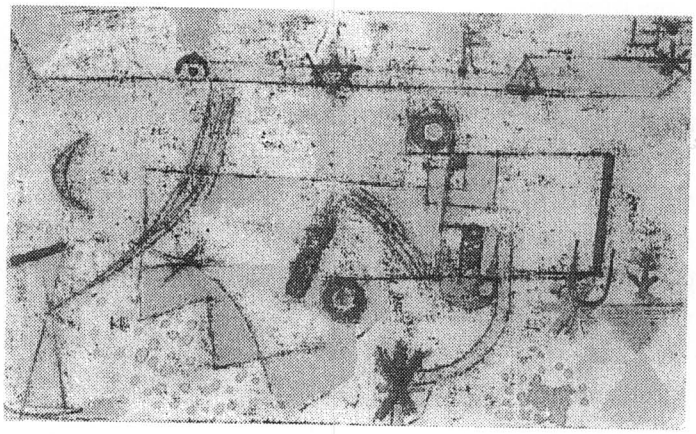
The Czech, Frantisek Kupka (1871-1957), residing in Paris since 1896, was in all probability the first artist to dispense with tangible subject matter and explore instead the dynamic potential of colour, as demonstrated in his pioneering abstract composition *Discs of Newton*, produced between 1911 and 1912 (*fig. 6.8*). These colour investigations were also pursued by Delaunay who engaged in so-called simultaneous perception from 1912. Apart from the Futurists' kinetic example, creative impetus was also derived from 19th-century scientific colour theories and the philosophical premises of Henri Bergson (1859-1941) on the assimilation of sequential perceptible experiences. But, whereas the Futurists favoured the pointillist technique of the Neo-Impressionists to convey motion, Delaunay continued to employ the faceted pictorial idiom of Cubism (*fig. 6.9*). Kupka, in turn, confined his experiments to circular geometric configurations, recalling Léger's tubular treatment of form.

---

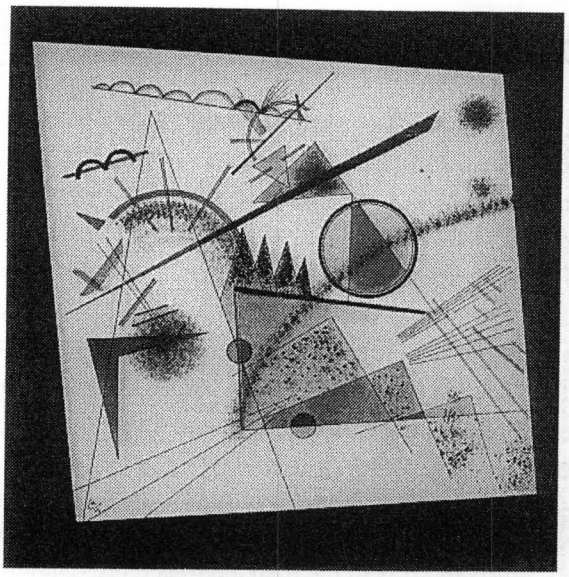
5 Moszynska, A., 1990, *Abstract Art* (London: Thames & Hudson), 9, points out that the denotation "non-representational" is problematic since all art is in the final analysis representational in that it depicts something – even if only an intention.



6.12 Expressionist Abstraction: Kandinsky, *Painting with Blue Arc* (1912).



6.13 Expressionist Abstraction: Klee, *In Bach's Style* (1919).



6.14 Expressionist Abstraction: Kandinsky, study for *In the Black Square* (1923).

At the hosting of the seminal "Section d'Or Exhibition" in October 1912, this tendency towards abstraction was conspicuous, prompting Apollinaire to make a distinction between different interpretations of Cubism, which he qualified as "scientific", "intuitive", "physical" and "orphic". [6] Apollinaire rightly anticipated the advance from Cubism towards a non-figurative means of artistic expression that relied exclusively on the rudimentary principles of art to convey specific conceptual, intellectual and emotional intentions.

This disposition towards abstraction (or "pure painting" as it was referred to at the time) was, in addition to Kupka, Delaunay and his wife Sonia (1885-1979), also evident in the work of Léger, Duchamp (*fig. 6.10*) and Francis Picabia (1879-1953, *fig. 6.11*) – in retrospect, the five artists associated with Orphism. However, none of these artists were committed to abstraction *per se*. Instead, they sought to express certain states of consciousness – especially the 'modern'. Since the non-figurative transcends all customary associations, it was considered a fitting pictorial response to the radical societal transformations and techno-scientific discoveries emblematic of the early 20th century. The Orphists propagated an altered, collective mindset that was to embrace universal and cosmic values rather than the immediate and the tangible, finding justification for this conviction in the atomic and relativity theories of Ernst Rutherford (1871-1937) and Einstein (Spate, 1980; 1991: 89).

Unlike many other aesthetic initiatives, the Orphists had no common goal except a mutual fascination with the dynamics of contemporary existence. Each of these artists pursued their interpretation of the prevailing consciousness independently and in accordance with their respective interests, hence, the difference in pictorial approach and the varying degrees of abstraction.

Of all the Orphists, Delaunay developed the most comprehensive rationale for pure painting and restricted his development in terms thereof. [7] He maintained that recognition of the subject keeps the spectator captive in the physical world and that only a non-representational rendering can transcend this experience and communicate universal premises. As the most articulate exponent of this particular genre, Delaunay's colour abstractions and writings were most influential. As a result of his example, the Futurists, Severini and Balla, severed all ties with representational content and explored other ways of depicting motion. Delaunay's influence was also discernible in the concurrent optical movements, Synchronism and Rayonism, and impacted on the members of Der Blaue Reiter.

6.4.3 Expressionist Abstraction (c. 1910-c.1931) [8]

Apart from the pioneering initiatives of Kupka and Delaunay, Russian artist and co-founder of the German initiative Der Blaue Reiter, Vasily Kandinsky (1866-1944), had also been experimenting with non-figurative art since the early 1910s. Some historians are adamant that Kandinsky's *Abstract Watercolour* (in the vein of *Painting with Blue Arc, fig. 6.12*) preceded Kupka's *Discs of Newton* by one year, whereas others maintain that it dates from 1913.

Regardless, Kandinsky's approach to abstraction was far less scientific than that of his French counterparts, and intrinsically metaphysically-based. This stance was largely inspired by Goethe's non-scientific *Theory of Colour* of 1810, and the theosophical doctrines to which there was wide

---

6 The denotation "Orphism" was derived from Orpheus, the Greek mythological musician. Apollinaire evidently associated the evocative nature of Orpheus' music with this challenging development in art.

7 With reference to Delaunay's seminal essays "Réalité, Peinture Pure" and "La Lumière", written in 1912. See Chipp, H. , 1968, *Theories of Modern Art* (Los Angeles: Univ. of California Press), 317-320, for translated excerpts.

8 As tempting as it may be to refer to Kandinsky's work as abstract expressionist, art historians make a distinction between "Expressionism" – the aesthetic movement that emerged in Germany before the First World War – and "Abstract Expressionism" – the American initiative that materialized after the Second World War and epitomized by the so-called action paintings of Jackson Pollack (1912-1956). Notwithstanding, there can be no doubt that Kandinsky was the progenitor of Abstract Expressionism.

assent at the beginning of the 20th century. By Kandinsky's own admission, his preoccupation with the rudimentary principles of art was not based on scientific research but on so-called emperical feeling as formulated in his influential text *On the Spiritual in Art*, published in 1912. Although artists like Van Gogh had previously explored the emotive propensity of colour, Kandinsky, by contrast, substituted subject matter with colour, recognizing that colour *per se* can embody properties previously denoted by objects. While certain conclusions can be reached from the psychological implications of colour, Kandinsky's writings indicate clearly that his investigations were governed by spiritual preoccupations. A typical extract from *On the Spiritual in Art* reads:

> "Colour is a means of exerting direct influence upon the soul ... Colour is the keyboard, the eyes are the hammers, the soul is the piano with many strings. The artist is the hand which plays, touching one key or another purposively to cause vibrations of the Soul." (Moszynska, 1990: 27)

As traditional subject matter had been dispensed with, and past pictorial pursuits had become redundant, considerable attention was given to the organization of the abstracted pictorial content. Consequently, composition took on new meaning, stimulating a particular interest in music. Kandinsky, his close associate Paul Klee (1879-1940) and all the early exponents of abstract art were drawn to the correspondence between music and the non-figurative. [9] Music, as an equally abstract means of aesthetic expression, can convey considerable emotive content. The metaphorical properties of different sounds and their equation with specific colours, appealed particularly to Kandinsky's spiritual sensibilities. As aural consonance is fundamental to any musical composition, aspects such as rhythm, harmony, order and balance bear direct effect on the pictorial composition – qualities, in turn, that interested Klee (*fig. 6.13*). [10]

As tutors at the Bauhaus, respectively from 1921 and 1922, Klee and Kandinsky contributed significantly to the academic consecration of non-figurative art. However, as a result of the persuasive De Stijl aesthetic, Kandinsky's elusive compositions, derived from so-called theosophical thought forms, acquired a distinctly geometrical quality from 1923 (*fig. 6.14*). Notwithstanding, both Kandinsky and Klee continued to pledge their commitment to the spiritual and emotional properties of their subject matter (*ibid.*: 98).

6.5 GEOMETRIC CUBISM: NEO-PLASTICISM (1915-1944)

6.5.1 Piet Mondrian

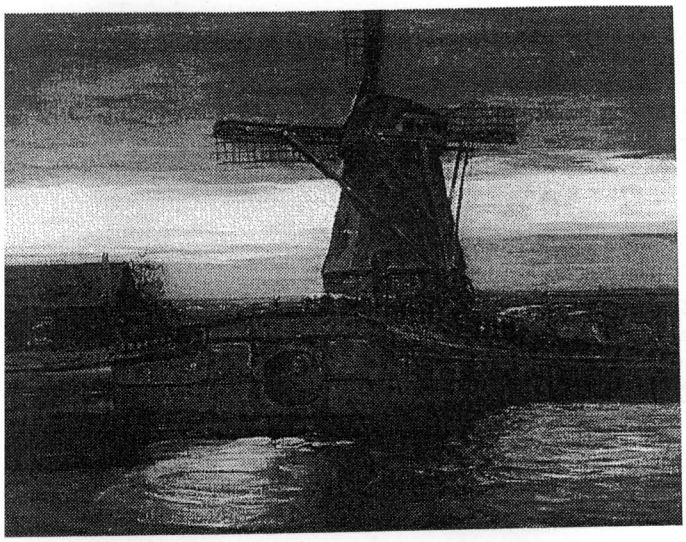
Of all the mentioned artists, Mondrian's development towards total abstraction was the most consistent. Although he only produced his first truly abstract work in 1915, four years after Kupka and Kandinsky, he never deviated from his ardent commitment to the non-figurative, unlike many of his contemporaries. [11]

---

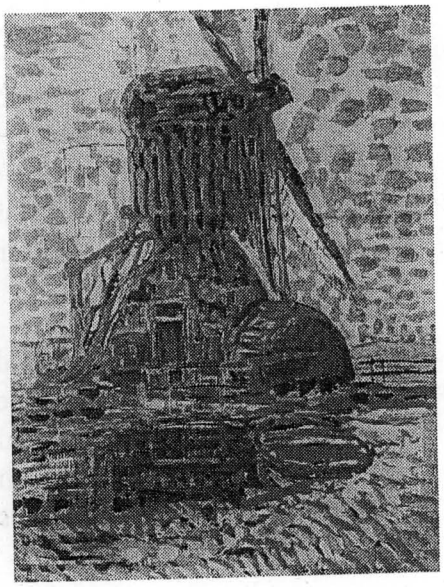
9 According to Moszynska (1990: 38-43), Klee was particularly interested in the order and balance inherent in the classical musical compositions of Johann Sebastian Bach (1686-1750) and Wolfgang Amadeus Mozart (1756-1791). Klee aimed at recreating the same sense of musical formality in the organization of his painterly compositions, such as, *Sound of the Fanfares for the Psalm* (1913) and *Sounds of the Organ* (1914), via intricate linear patterns. Kandinsky, in turn, drew inspiration from the late-Romantic music of Richard Wagner (1813-1883) and the dissonant compositions of avant-garde composer Arnold Schoenberg (1874-1951). Between 1908 and 1912, Kandinsky collaborated with a German composer, one Thomas von Hartmann, on a musical composition *The Yellow Sound* – a period when the artist was actively investigating the emotive properties of colour.

10 See Düchting, H., 1997, *Paul Klee – Painting Music* (Munich: Prestel-Verlag).

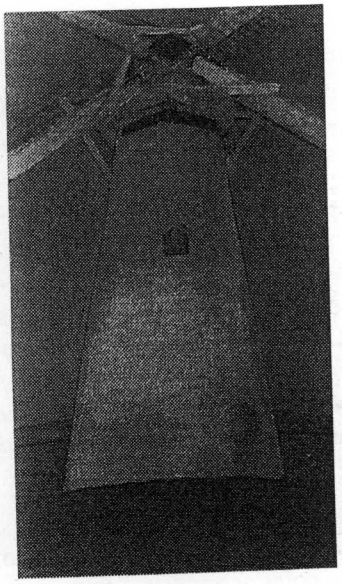
11 Few of the pioneering abstract artists, including Delaunay and Kupka, sustained their commitment to total abstraction throughout their artistic careers. Most returned to the figurative at some point or another – some as a result of the persuasive surrealist genre, others due to the volatile political circumstances in Germany and the Soviet Union before and during the Second World War, though lasting in the latter instance until the early 1950s.



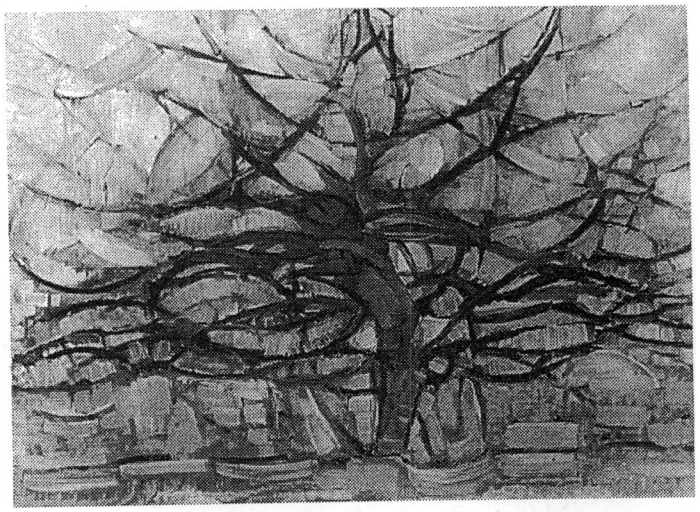
6.15 Mondrian, *Windmill* (1905/6).



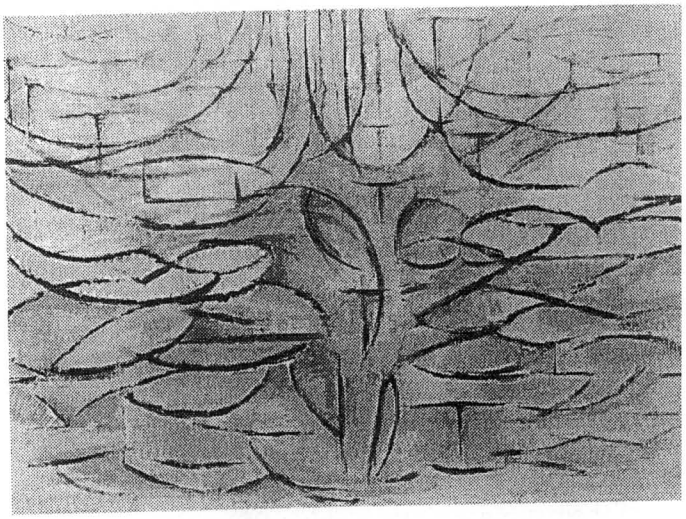
6.16 Mondrian, *Windmill in Sunlight* (1908).



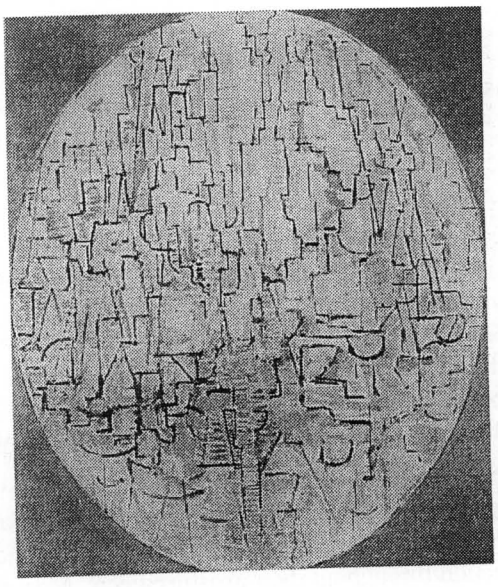
6.17 Mondrian, *The Red Mill* (1911).



6.18 Mondrian, *The Grey Tree* (1912).



6.19 Mondrian, *Flowering Apple Tree* (1912).



6.20 Mondrian, *Oval Composition – Trees* (1913

Following a conventional Beaux Arts education, Mondrian gradually emulated the colour intensification of Van Gogh and the pointillist technique of the Neo-Impressionists (*figs 6.15-6.17*). His first-hand encounter with Cubism at an exhibition hosted at the Moderne Kunstkring in Amsterdam in 1911, prompted his departure for Paris the following year, whereupon he also altered the spelling of his surname. His work dating from his stay in Paris vividly demonstrates the cubist influence as each sequential painting is more reductive than former (*figs 6.18-6.20*). Already prior to his return to the Netherlands in 1914, Mondrian started to feel that "Cubism did not accept the logical consequences of its own discoveries; it did not develop abstraction to its utmost consequence, the expression of pure truth" (Warnecke: 1991, 35). [12]

It was only upon his return that he finally extended the boundaries of Cubism and pursued its inherent geometric content. A number of coinciding factors contributed to this endeavour, firstly, the neo-Platonic and pantheistic doctrines of Theosophy and, secondly, his acquaintance with fellow Dutch artist Bart van der Leck (1876-1958).

As an active member of the theosophical society since 1909, Mondrian ascribed increasingly to the notion that art should "provide a transition to the finer regions, which I shall call the spiritual realm" (Moszynska, 1990: 98). Moreover, in the influential theosophical text *Isis Unveiled* (1877), Madame Blavatsky (1831-q.v.), author and one of the founders of this metaphysical movement, identified certain geometric configurations that were supposedly imbued with mystical properties. These included the so-called celestial perpendicular, the terrestrial horizontal, the square and the cross. The cosmic pre-eminence of the orthogonal was echoed by an acquaintance of Mondrian, the mathematician and theosophist M. H. J. Schoenmaekers, in *Het Nieuwe Wêreldbeeld* of 1915:

> "... the two fundamental complete contraries which shape our earth are: the horizontal line of power, that is the course of the earth around the sun and the vertical, profoundly spatial movements of rays that originate in the centre of the sun." (Frampton, 1968; 1991: 142)

It is no coincidence that Mondrian started in that year to reduce his subject matter to horizontal and vertical lines, confined only by an oval format and indicative of the *tableau-objet* approach of the Cubists *(figs 6.21)*. These linear experiments were surpassed, though, by studies in colour after the example of Van der Leck whom Mondrian met in 1916. As a graphic artist by profession, Van der Leck had initiated a series of abstractions in which he systematically reduced the naturalistic starting point to geometric notations consisting of primary colours (*fig. 6.22*).

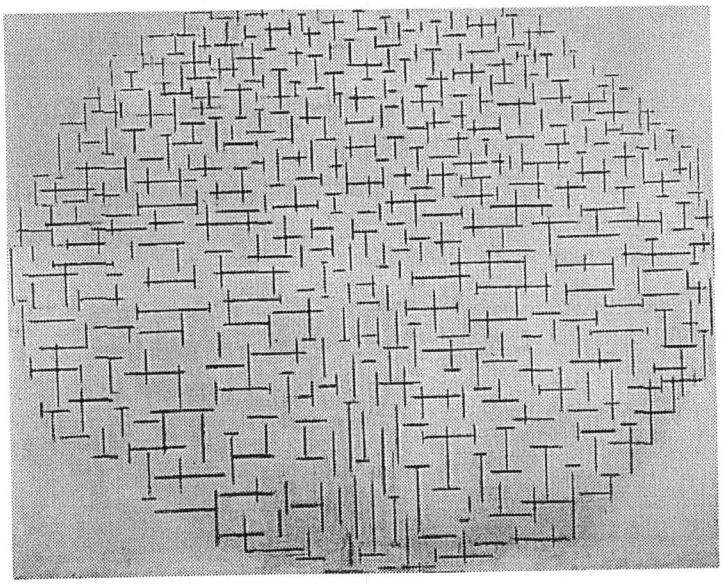
Having previously experimented with line and colour separately, Mondrian started to combine these two approaches (*fig. 6.23*). These superimpositions still alluded to a certain degree of pictorial depth, but which he dispensed with in ensuing compositions. By 1917, Mondrian had discarded the narrative generator and was concentrating on so-called elemental compositions, consisting solely of line and colour (*fig. 6.24*). This novel artistic enterprise was christened "Neo-Plasticism" by Mondrian in his seminal essay "De Nieuwe Beelding in de Schilderkunst" (Neo-Plastic Painting, 1917/8), mimicking the title of Schoenmaekers' book *Beeldende Wiskunde* (Plastic Mathematics) of 1916.

6.5.2 The Founding of De Stijl

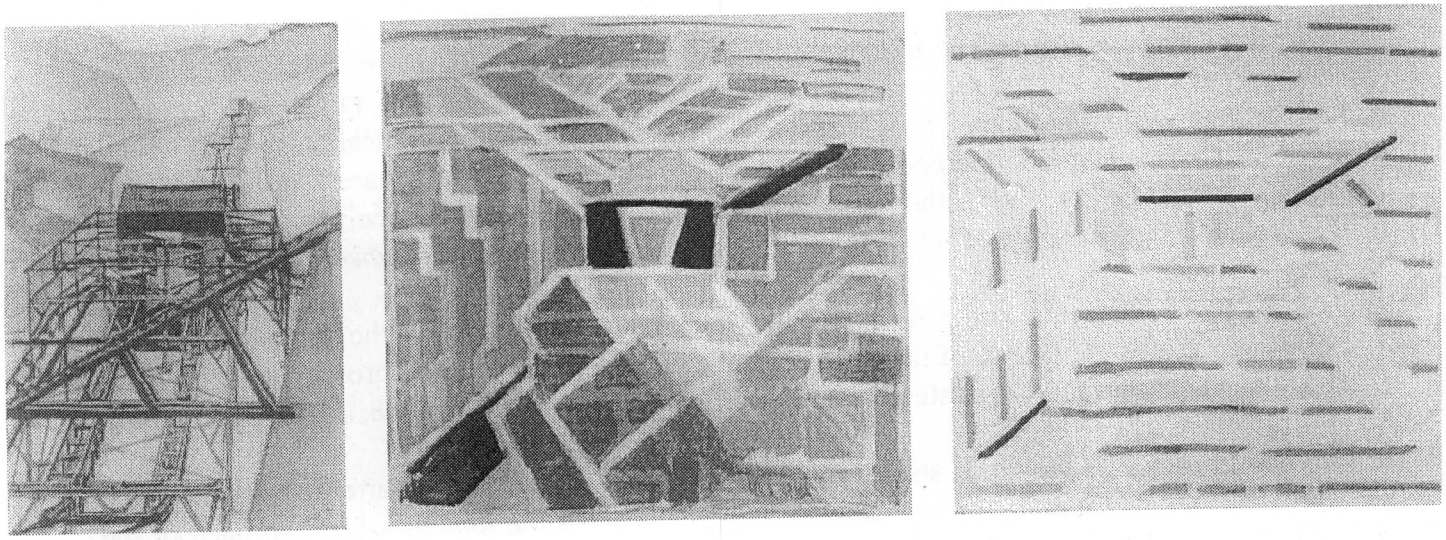
Mondrian's and Van der Leck's investigations caught the attention of self-taught artist and critic Emil Küpper (alias Theo van Doesburg, 1883-1931) and Vilmos (Hertz) Huszár (1884-1960), a Hungarian artist residing in the Netherlands since 1909. Van Doesburg and Huszár adopted this

---

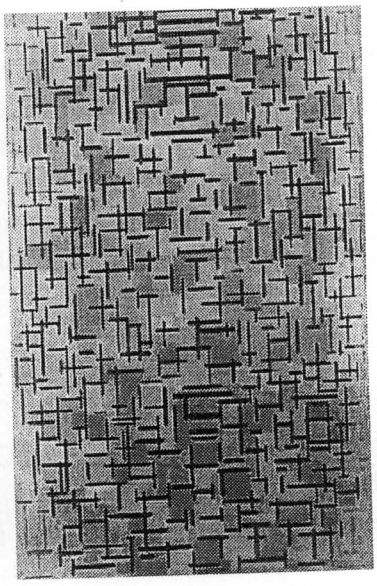
12 From Mondrian, P., 1951 ed., "Toward the True Vision of Reality", *Plastic Art and Pure Plastic Art, 1937 and Other Essays, 1941-1943* (New York).



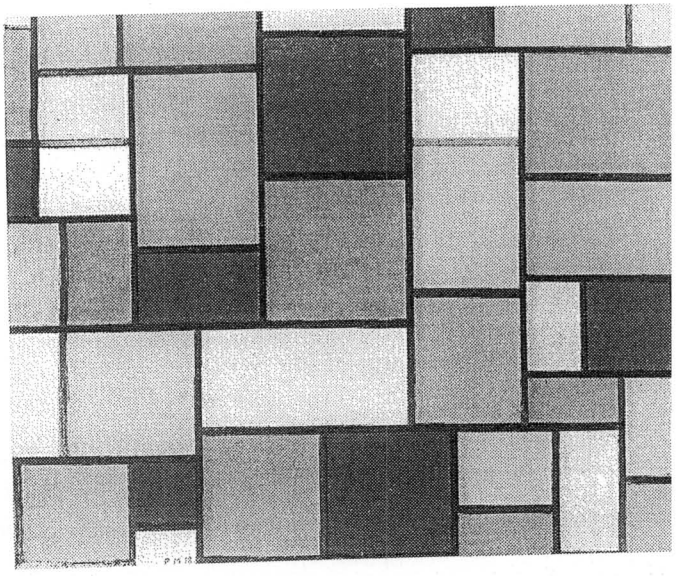
6.21 Mondrian, *Composition No. 10 – Pier and Ocean* (1915).



6.22 Van der Leck, process of abstraction for *Composition 1916, No. 4 – Mine Triptych* (1914-1916).



6.23 Mondrian, *Composition* (1916).



6.24 Mondrian, *Composition: Colour Planes with Grey Contours* (1918).

novel pictorial technique for a joint commission for stained glass windows (*figs 6.25-6.26*) – a medium condusive to stylized geometric configurations. At Van Doesburg's instigation, these four artists, together with Belgian-born sculptor and painter Georges Vantongerloo (1886-1965), Dutch architects Oud, Jan Wils (1891-1972) and Robert Van't Hoff (1887-1979, and poet Anton Kok (q.v), participated in the founding of the De Stijl initiative in October 1917. Its proponents steadily worked towards a collective aesthetic idiom, publishing their objectives in their journal with the same name. By the end of 1920, the orthogonal and the primary colour range, in combination with the three non-colours – white, black and grey – constituted the restrictive pictorial repertoire of the influential De Stijl aesthetic (*figs 6.27-6.29*), concurring with Schoenmakers' renowned hypothesis on colour from *Het Nieuwe Wêreldbeeld*:

> "The three principal colours are essentially, yellow, blue and red. They are the only colours existing ... Yellow is the movement of the ray ... Blue is the contrasting colour to yellow ... As a colour, blue is the firmament, it is line, horizontality. Red is the mating of yellow and blue ... Yellow radiates, blue 'recedes', and red floats." (Frampton, 1968; 1991: 142)

6.5.3 Theoretical Premises

In view of the minimal content and revolutionary nature of their paintings, all the pioneering abstract artists felt compelled to devise elaborate theories in support of their radical endeavours.

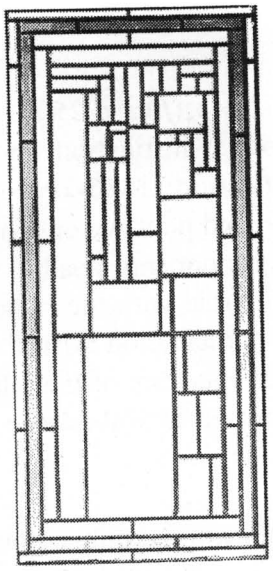
According to Van Doesburg, neo-plastic art embodied a "visual philosophy" (Doig, 1986: 11). Its philosophical content was a conflation of diverse, though interrelated, schools of thought, compounded by the prevailing industrial *Zeitgeist*. In addition to Theosophy with its distinct neo-Platonic connotations, the ethical views of Benedict de Spinoza (1632-1677), the aesthetic precepts of Hegel and Arthur Schopenhauer (1788-1860), and Dutch Calvinism are also cited as points of departure.

Like the Orphists, the Neo-Plasticists asserted that the prevailing techno-scientific paradigm demanded an altered mindset and, consequently, a different mode of artistic expression. They, too, were preoccupied with a collective, modern consciousness, though, in their instance, taking to an extreme the notion of collectivity. They foremost equated naturalistic depiction with subjective individualism which they were at all costs trying to avoid. In their opinion, mimetic representation stifled progress and, more importantly, the advance to spiritual enlightenment. Instead, they aspired to a collective anonymity that transcended the phenomenological and communicated universal, metaphysical premises. According to the signatories of first De Stijl Manifesto: [13]

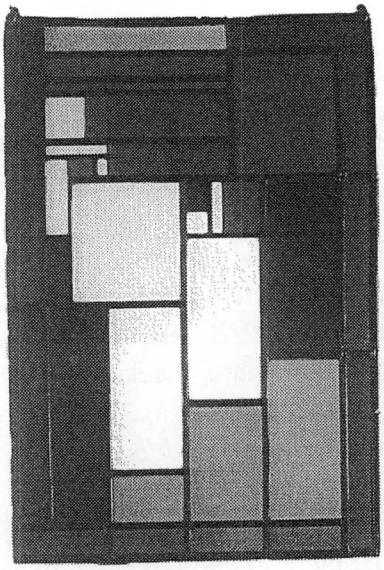
> "1. There is an old and a new consciousness of the age. The old is directed towards the individual. The new one is directed towards the universal. The struggle of the individual against the universal may be seen both in the world war and in modern art.
> 2. The war is destroying the old world with its content: individual predominance in every field.
> 3. The new art has brought to light that which is contained in the new consciousness of the age: a relationship of equality between the universal and the individual.
> 4. The new consciousness of the age is prepared to realize itself in everything, including external life.
> 5. Tradition, dogmas and the predominance of the individual stand in the way of this realization ..."

---

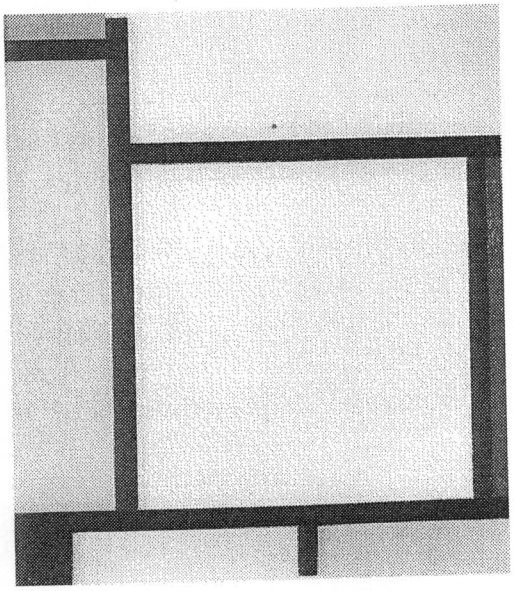
13 Van Doesburg, T., Van't Hoff, R., Huszar, V., *et al.*, Nov. 1918, "'De Stijl': Manifesto I", *De Stijl*, vol. 2, no. 1; reprinted in Conrads, U. (ed.), 1970 ed., *Programs and Manifestoes of 20th-century Architecture*, trans. Humphries, L. (Cambridge, Mass.: MIT Press), 39.



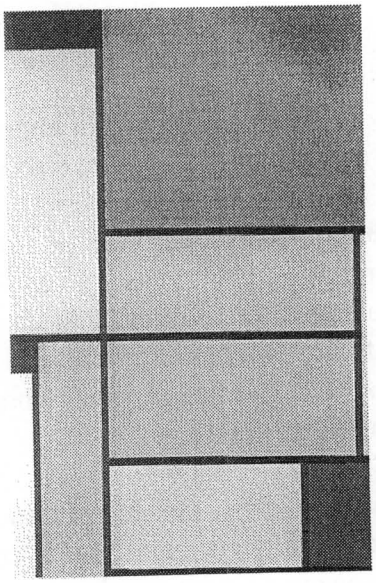
6.25 Huszár, *Girl* (1916).



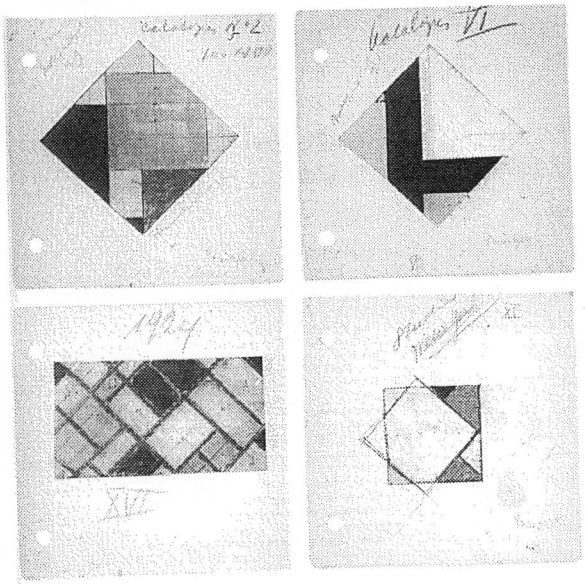
6.26 Van Doesburg, *Woman's Head* (1917).



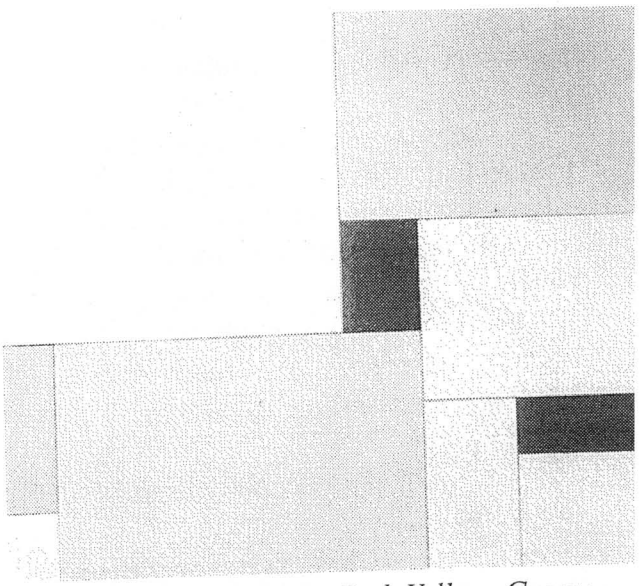
6.27 Mondrian, *Tableau 1* (1921).



6.28 Mondrian, *Composition with Red, Yellow and Blue* (1921).



6.29 Van Doesburg,
[illegible] compositions (c. 1927).



6.30 Vantongerloo, *Red, Yellow, Green: Group* $y = -ax^2 + bx + c$; $y^1 = -2ax + b$; $y = -ax^2 + bx + c$

In the essay "Natural Reality and Abstract Reality" (1919; 1968: 321), [14] Mondrian adds:

> "Modern man ... exhibits a changed consciousness ... The truly modern artist is ... conscious of the fact that the emotion of beauty is cosmic, universal. This conscious recognition has for its corollary an abstract plasticism, for man only adheres to what is universal."

Concurring with the aesthetic cosmogony of Plato, the Neo-Plasticists aspired to give expression to a 'higher' creative ideal. According to Allan Doig (1986: 39), an authority on Van Doesburg, these artists considered it their "duty" to "go beyond the accidentals of particular phenomena to the universal content, the 'Platonic' idea". They maintained that a so-called plastic objectivity would be achieved via pre-ordained artistic means, which, in their instance, were restricted to the primary colour range and the orthogonal. Given this limited pictorial arsenal, the hierarchy and distribution of form, line and colour were of cardinal importance, constituting (as with music) a supposed art of relationships. Their pictorial compositions were considered the incarnation of universal equilibrium, with the attainment of balance and harmony both the objective and content of their endeavours. In the words of Doig (*ibid.*: 12, 5):

> "The proper 'subject' of art is art itself, and the elementary means of art – line, form and colour – are not to be used for any other purpose than to reveal harmony and balance within the new art of relationships ..."
> "[Thus] these purely abstract relationships were for [De Stijl] the only acceptable content for art, and as a result the natural subject had to undergo complete 'transformation' to achieve such a 'universalised' aesthetic balance.' "

In view of the importance attached to compositional organization, it was inevitable that the Neo-Plasticists would investigate the correspondence between art and music. Unlike Kandinsky and Klee, the emotive propensities of music were far less of a consideration than its mathematical properties. Van Doesburg developed elaborate theories on the distribution of colour that were based on classical numerological systems. [15] Vantongerloo pursued this mathematical connection most rigorously and even substituted the titles of his paintings (and sculptures) with algebraic equations (*fig. 6.30*). [16]

In the final analysis, Neo-Plasticism was a contemporaneous embodiment of Platonic aesthetic philosophy, yielded by prevailing circumstances. However, it transcended the imitative premises of the natural precedent and gave a far greater degree of validity to Plato's idealized mathematical and geometric precepts, specifically with regard to the pictorial arts. Doig (*ibid.*: 40) concurs:

> "The ultimate aim was not to the reproduction of nature, it was to create an image of the Idea, the Absolute Idea. Pure form was the proper content of the work of art; the plastic means of art, colour, line, and plane, were to be used in the revelation of proportion, balance and unity."

---

14 Originally published as Mondrian, P., 1919, "De Niewe Beelding in Schilderkunst", *De Stijl*, vol. 3, no. 1; translation reprinted in Chipp (ed.), 1968, *Theories of Modern Art:* 321-325.

15 See Doig, A., 1986, *Van Doesburg: Painting into Architecture, Theory into Practice* (Cambridge: Cambridge Univ. Press), 58-105.

16 Paradoxically, Mondrian was the least convinced of this mathematical procedure and stated that a work of art should consist of "subjective and objective factors in mutual balance", as cited from Mondrian, P., 1937, "Plastic Art and Pure Plastic Art", *Circle*; reprinted Chipp (1968: 361). Mondrian (*ibid.*: 358) even contended that "If he makes art into an 'algebraic equation', that is no argument against the art, it only proves he is no artist" – in all probability a comment made with reference to Vantongerloo's paintings.

Despite the neutrality of the Netherlands, the surrounding chaos and destruction caused by the First World War contributed significantly to the Neo-Plasticists' commitment to a visual equilibrium that was sought through cosmic and universal means. It is not surprising that comfort was found in the certainties of absolute values rather than the contingencies of the natural, the institutionalized, or the man-induced.

In conclusion, De Stijl was not nearly as cohesive as often assumed and its membership was in a constant state of flux. Mondrian parted company in 1925 upon Van Doesburg's audacious insistence to extend its plastic repertoire by incorporating the diagonal. However trite, Mondrian was not prepared to accept any compromise. He fool-hardy persisted in his univalent commitment to total – if not orthogonal – abstraction, executed consistently in accordance with the consecrated neo-plastic principles until his death in 1944. By contrast, the nebulous De Stijl movement ceased to exist long before that time as it drew to a close with Van Doesburg's untimely death in 1931.

6.6 PLANIMETRIC CUBISM: SUPREMATISM (1913-1935)

6.6.1 Kazimir Malevich

In addition to the mentioned non-figurative pioneers, reference must be made to Kazimir Malevich (1878-1935), Russian artist and founder of Suprematism. Malevich not only pursued abstract art to a definitive conclusion, but, together with Neo-Plasticism, played a pivotal role in the emergence of a modern architectural vocabulary.

Since the hosting of the famous series of "Jack of Diamond Exhibitions" [17] on Cubism in Moscow from 1910 to 1913, and the staging of several futurist happenings that included a lecture tour by Marinetti, Russian artists were particularly well informed about the latest artistic developments from abroad. In a country haunted by technological backwardness and vast economical discrepancies, Cubism and Futurism found a receptive audience amongst the artistic intelligentsia who eagerly anticipated revolutionary change in all fields of human activity. These radical aesthetic innovations were rapidly assimilated, imbued with socio-political connotations and in due course adopted for propagandist purposes.

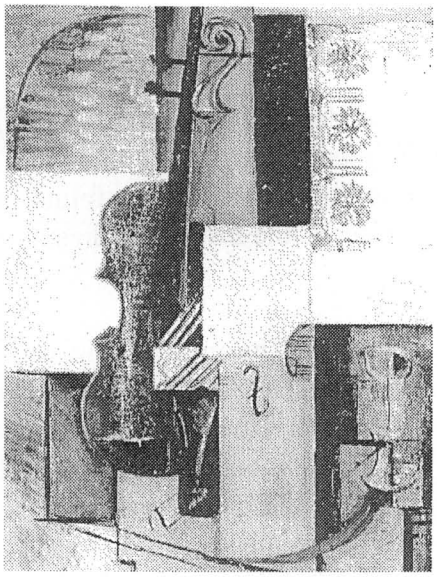
Malevich was one of the first Russians to emulate these persuasive artistic influences (*fig. 6.31-6.32*). He was considerably impressed with the reductive methodology of Cubism, its geometric propensities, and the visual dynamics explored by the Futurists. In the essay "Die Gegenstandslose Welt" (1927; 1968: 337), [18] Malevich makes the following comment:

> "The art of the industrial environment has its first beginnings in Cubism and Futurism, that is, at the point where conventional painting leaves off ... it is the expression of the rhythm of our time."

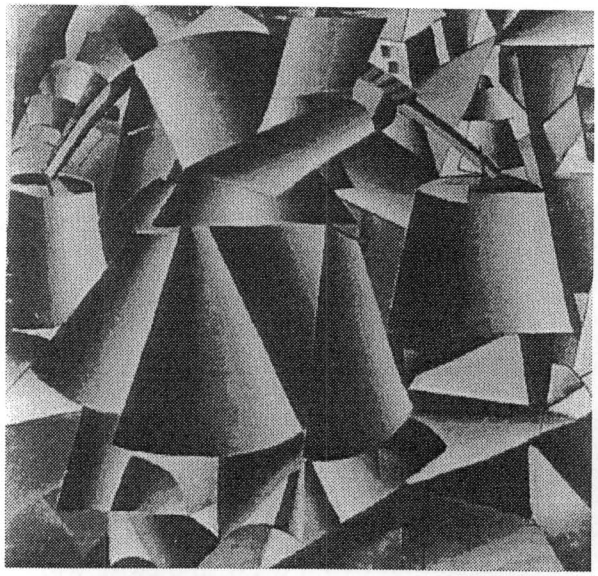
---

17 These series of exhibitions were organized by French art critic and author Alexandre Mercereau (1884-q.v.). According to Fry, E. (ed.), 1966, *Cubism* (London: Thames & Hudson), 183-185, works by Gris, Lhote, Le Fauconnier, Léger, Braque and Picasso were shown intermittently. The latter two artists were only represented in the final year of the exhibition.

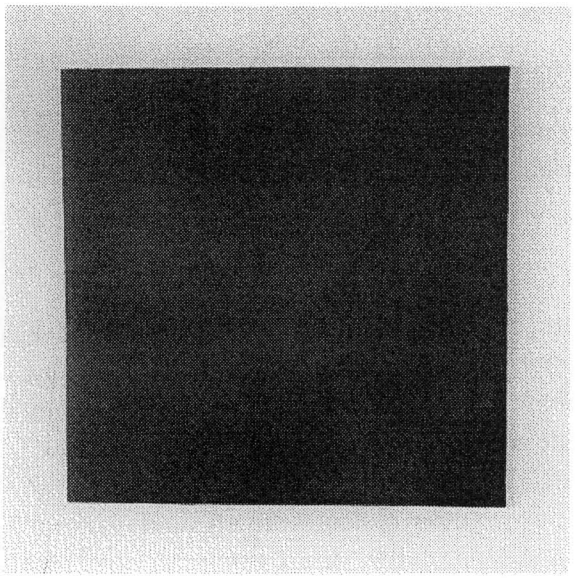
18 Malevich, K., 1927, "Die Gegenstandslose Welt", *Bauhausbuch II* (Munich); translated extract published as "Introduction to the Theory of the Additional Element in Painting" in Chipp, 1968, *Theories of Modern Art*: 337-340.



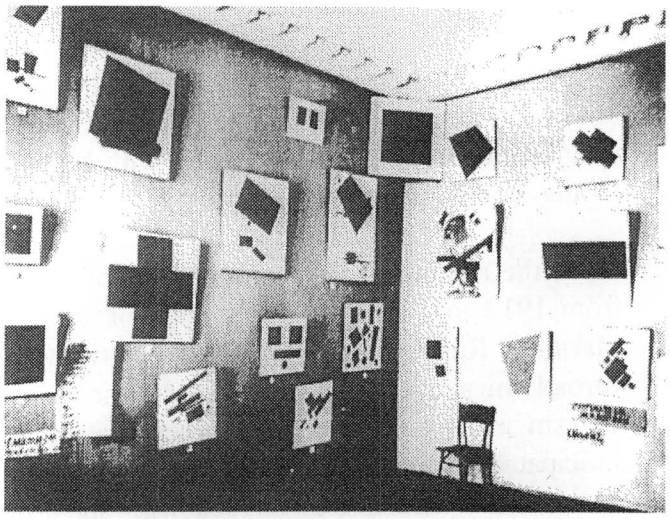
6.31 Malevich, *The Violin* (c. 1912).



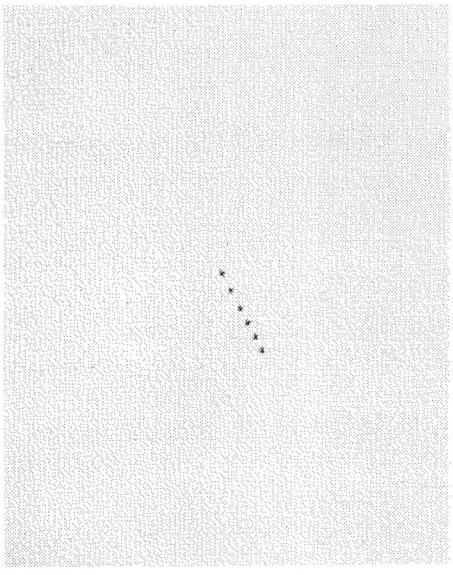
6.32 Malevich, *Woman with Pails of Water: Dynamic Arrangement* (1912).



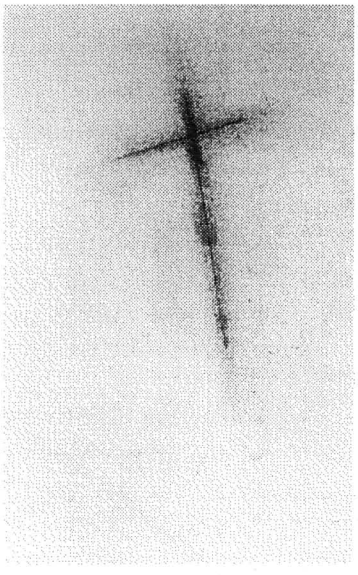
6.33 Malevich, *The Basic Suprematist Element: The Square* (c. 1913).



6.34 Vintage photograph of Malevich's display at tl *0-10, The Last Futurist Exhibition*, Petrograd (1915



6.35 Malevich, *Suprematist Composition Conveying a Feeling of Universal Space* (1916).



6.36 Malevich, *Suprematist Composition Conveyir the Feeling of a Mystic Wave from Outer Space* (191

Yet, Malevich was quick to internalize the conceptual significance of both movements, develop his own particular response to the modern consciousness and liberate art even further from any conditioned associations. This culminated in his so-called non-objective (as opposed to anti-subjective) artistic approach, which was a metaphysical interpretation of the spatial revelations of Cubism and kinetic preoccupations of the Futurists, conveyed in *From Cubism and Futurism to Suprematism: The New Realism in Painting*, published in 1916.

Suprematism emerged in 1913 with the most abstract composition produced to date. As the title suggests, *The Basic Suprematist Element: The Square* (fig. 6.33) constituted a black square on a white background, preceding Mondrian's elemental compositions by two years. [19] Malevich (1927; 1968: 342) [20] reflected retrospectively :

> "When, in 1913, in my desperate attempt to free art from the ballast of objectivity, I took refuge in the square form and exhibited a picture which consisted of nothing more than a black square on a white field, the critics and, along with them the public sighed, 'Everything which we love is lost. We are in the desert ... Before us is nothing but a black square on a white background."

6.6.2 Rudimentary Suprematism

Suprematism progressed through three distinct phases. The brief incubatory stage, consisting of singular geometric shapes, was surpassed by a dynamic phase in which the configurations had multiplied, and culminated in a volumetric metamorphosis. From the outset, Malevich restricted his artistic portfolio to the line, square, rectangle, cross and circle. Yet, regardless of how minimal the content, these planimetric compositions were pregnant with meaning, and explored the reconciliation between the contemporaneous and the transcendental. To Malevich, the geometric represented the supremacy of the man-made and was emblematic of the modern, industrial paradigm.

The straight line symbolized man's ascendancy over the chaos of nature. The square, in turn, was considered the most supreme manifestation of human intelligence since it does not occur in nature. These geometric entities also embodied a metaphysical significance that were informed by theosophical doctrines and represented aspects such as birth, life, death and immortality (Scharf, 1966; 1991: 138-140).

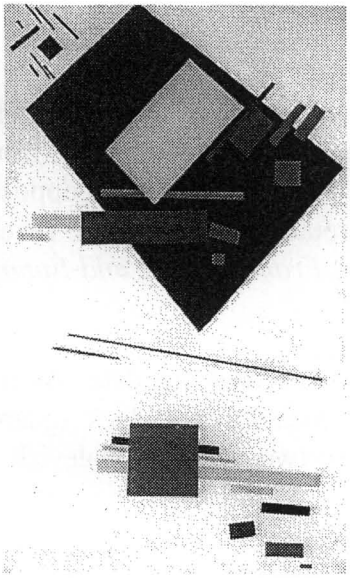
The significance that Malevich attributed to the square was evident in the way in which it was displayed at the avant-garde exhibition "0-10, The Last Futurist Exhibition", hosted in Petrograd (former St Petersburg) in 1915 (*fig. 6.34*). By mimicking the Russian Orthodox tradition of hanging the icon diagonally across the corner, Malevich resoundingly declared the square, the icon of his time – technologically, as well as spiritually.

Not only were these planimetric configurations considered profound, but their painterly context was equally significant in that it represented the infinity of space, as the following titles suggest: *Suprematist Composition Conveying a Feeling of Universal Space* (1916, *fig. 6.35*) and *Suprematist Composition Conveying the Feeling of a Mystic Wave from Outer Space* (1917, *fig. 6.36*).

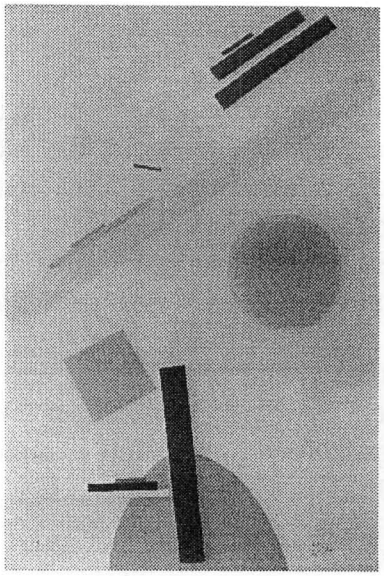
---

19 Weston, R., 1996, *Modernism* (London: Phaidon), 145, disputes the dating of *The Basic Suprematist Element: The Square*, contending that it was deliberately altered by two years to claim superiority to Mondrian's abstractions. However, the minimalist backdrop painted by Malevich for the experimental and politically-biased opera *Victory over the Sun* dates from 1913, marking the first appearance of the square motif.

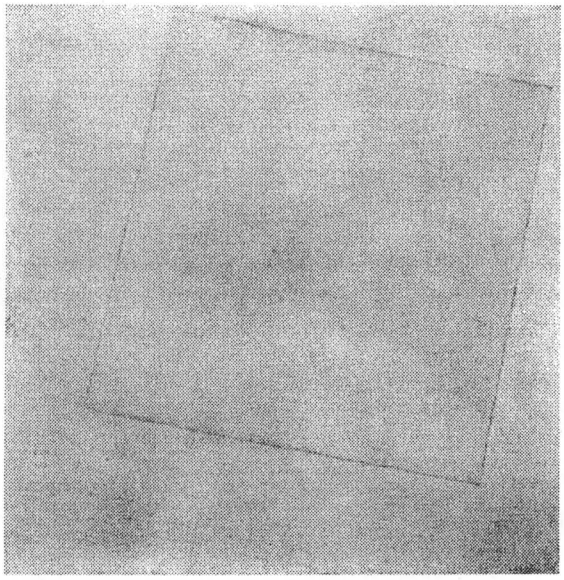
20 Malevich, K., 1927, "Die Gegenstandslose Welt", *Bauhausbuch II* (Munich); translated extract published as "Suprematism" in Chipp (ed.), 1968, *Theories of Modern Art*: 341-346.



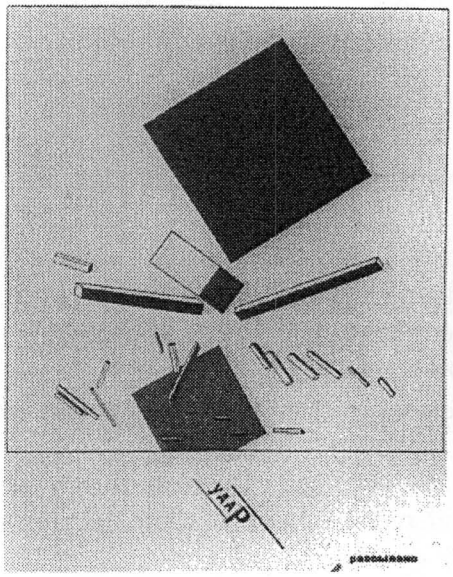
6.37 Malevich, *Dynamic Suprematism* (1915).



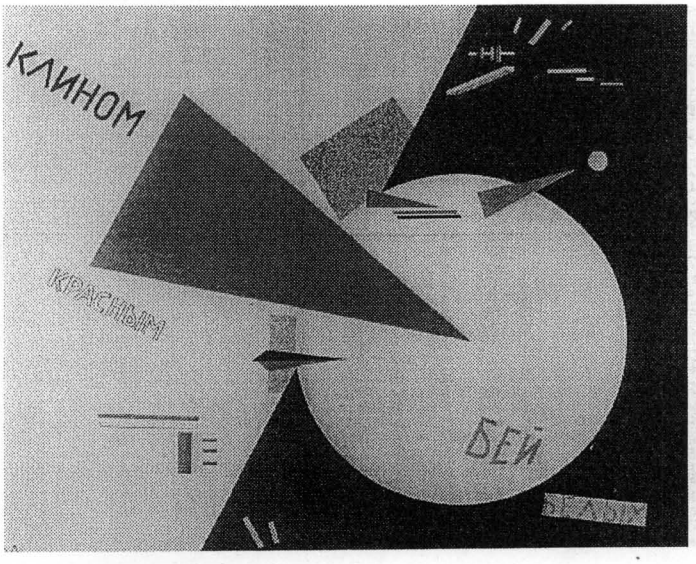
6.38 Malevich, *Suprematist Composition* (1917).



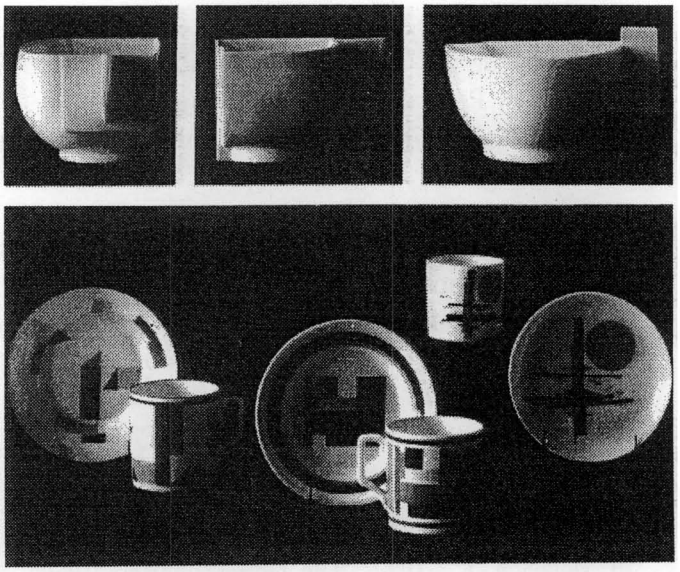
6.39 Malevich, *Suprematist Composition: White on White* (1917/8).



6.40 Klutsis, *Axiometric Painting* (c. 1920).



6.41 Lissitzky, *Cleave [Beat] the Whites with the Red Wedge* (1919/20).



6.42 (**Top**) Malevich, suprematist-inspired crockery (1923).

6.43 (**Bottom**) Nikolai Suetin (1897-1954),

Although his initial painterly compositions were completely two-dimensional, [21] Malevich was also preoccupied with the fourth dimension, referred to by title, *Painterly Realism of a Football Player – Colour Masses in the Fourth Dimension* (c. 1915), and echoed in his writings. To him and many of his Russian peers, [22] the fourth dimension was not only indicative of the new scientific paradigm but it also encompassed existentialist suppositions concerning the spiritual realm, providing a vital connection between the physical and the metaphysical.

6.3 Dynamic Suprematism

During the dynamic stage of Suprematism, Malevich investigated the compositional means of conveying spatial and kinetic concepts. The hierarchical distribution of line, colour and shape, coupled with the manner in which these rudimentary pictorial means related to one another, created disconcerting spatial ambiguities, perspectival dislocations and optical tensions (*figs 6.37-6.38*).

The most important aspect that set Suprematism apart from Neo-Plasticism was that the compositional organization of the geometric content did not conform to the orthogonal. Whereas Mondrian was committed to a visual equilibrium, [23] Malevich, by contrast, aimed at a visual dynamicism that was achieved as a result of the defiance of the perpendicular. In the later development of Dynamic Suprematism colour was relegated to a secondary role. The resultant monochromatic compositions emphasized that motion could be suggested by shape alone. Thus, Malevich had indicated that movement could, in addition to the depiction of simultaneous views and the calculated distributions of colour accents, be achieved by the contra-positioning of the planimetric.

However, just when it seemed as if the compositional had surpassed the conceptual, Malevich produced his ultimate suprematist statement, the controversial *Suprematist Composition: White on White* of 1917/8 (*fig. 6.39*), in which the tilted white square seemingly generates its own energy, defies gravity and is suspended indefinitely in cosmic space. With this particular painting, Malevich had evidently exhausted his two-dimensional pictorial repertoire and henceforth directed his attention to the volumetric.

6.4. Suprematist Application

Even before producing the apogee of Suprematism, Malevich's emblematic geometric portfolio had been embraced by several Russian artists and architects, but adapted for their individual, conceptual and, ultimately, overtly propagandist purposes. For example, artist Gustav Klutsis (1895-1944) employed axonometric projections to explore the optical tensions created between the two-dimensional and three-dimensional (*fig. 6.40*). Graphic artist-*cum*-architect, Lazar (El) Lissitzky (1890-1941) exploited the suprematist vocabulary to convey political messages. This was

---

21 According to Moszynska (1990: 56), some preliminary sketches made by Malevich before his volumetric phase indicate that some of his two-dimensional compositions had been derived from orthographic projections. The planimetric footprint served as a remnant of the "geometric solid falling from space" – a visual analogy for the quasi-scientific theories of the Russian philosopher, Peter Ouspensky.

22 Moszynska (*ibid.*: 56-58) draws attention to the fact that the fourth dimension was a popular topic in Russia during the years prior to the First World War. Ouspensky wrote several books on the subject, including *The Fourth Dimension* (1909) and *Tertium Organum* (1911), as did another Russian author, Vladimir Solovyov. However, instead of time, Ouspensky equated the fourth dimension with life-hereafter, informing Malevich's cosmic transcendentalism.

23 Mondrian frequently used the term "dynamic equilibrium" to describe his artistic aims. This denotation is quite unsatisfactory when comparing his rather static compositions with those of Malevich – even though Mondrian did achieve some kinetic sensibility by the manner in which he distributed colour and varied line thicknesses.

technological expediency that coincided with the infectious techno-scientific climate of the Machine Age. The widespread currency that the suprematist vocabulary enjoyed was evident at the first anniversary celebrations of the October Revolution in Petrograd in 1918, where massive squares, demonstrated in the infamous poster *Cleave [Beat] the Whites with the Red Wedge* (1919/20, *fig. 6.41*), followed by illustrations for the children's book *The Tale of Two Squares*, produced together with Eliezer Markowitsch in 1922. The proponents of the concurrent constructivist movement also eulogized elementary geometric configurations since they embodied a rational integrity and rectangles, circles, rectangles, and so forth, adorned the facilities and became synonymous with the communist dispensation – albeit short-lived.

Suprematism also exercized a considerable influence on the applied arts produced in the Soviet Union during the 1920s. Devoid of its existentialist significance, the geometric vocabulary and compositional permutations of Suprematism served as a highly effective, decorative idiom for textile and even crockery design in which even Malevich participated (*figs 6.42-6.48*). During the late 1950s, Suprematism found precedent in the American aesthetic initiative, known as Minimalism.

6.9 THE CUBIST DERIVATIVES, IN CONCLUSION

Apart from Purism, no other painterly derivative of Cubism that dates from the period preceding the First World War – Synchronism, Rayonism or Vorticism – made any particular contribution to the consecration of modern architecture and requires any elaboration.

Purism – the least abstract of all the cubist derivatives – not only induced the tectonic transformation of Le Corbusier's architectural repertoire, but followed most closely the evolutionary sequence of Cubism. Significantly, of all the aesthetic movements that contributed to the codification of a modern architectural vocabulary, Purism was the only painterly enterprise that did not progress through an interim volumetric stage before emerging in architectural format.

In view of this unique characteristic, attention is directed towards the genesis of Purism before reviewing the volumetric incarnation of Cubo-Futurism, Neo-Plasticism and Suprematism in further chapters.

6.10 SUMMARY

For the sake of contextualizing the plastic consequences of Cubism, reference was made to those pictorial initiatives that played a pivotal role in establishing this interface.

The chapter commenced with the Italian aesthetic movement Futurism, since its glorified mechano-centricism underpined much of the theoretical discourse of 20th century architecture. Attention was also drawn to the fact that the Futurists were only able to convey effectively their radical conceptual intentions after a first-hand introduction to Cubism. Their pictorial endeavours engendered a sustained interest in motion and related dynamic propensities, spawned a host of cubo-futurist initiatives and contributed substantially to the genesis of abstract art.

The pioneering abstract artists, Orphists Frantisek Kupka and Robert Delaunay, and Expressionist Vasily Kandinsky, recognized that the rudimentary principles of art – line, shape, form and colour – are legitimate artistic subject matter and worthy of independent pursuit. The consequential dismissal of the figurative was considered a fitting response to the modern consciousness and then-recent techno-scientific innovations.

The work of Neo-Plasticist Piet Mondrian followed the evolutionary sequence of Cubism to a far greater degree than any of the other pioneering abstract artists. However, Mondrian soon felt that the Cubists did not pursue to satisfaction the logical consequences of their discoveries, hence directing his energies to the geometrical, and dispensing with the naturalistic starting point. His so-called elemental compositions were informed by theosophical doctrines and the abstractions initiated independently by his fellow Dutch artist, Bart van der Leck. Mondrian's and Van der Leck's pictorial initiatives caught the attention of self-taught artist Theo van Doesburg, who instigated the founding of the influential De Stijl movement, with its emblematic artistic repertoire that consisted of the orthogonal, the primary colour range and the three supposedly non-colours.

Russian artist Kazimir Malevich also pursued the geometric propensity of Cubism, though combined with the visual dynamicism of Futurism. Malevich investigated the reconciliation between the contemporaneous and the transcendental, ascribing a cosmological significance to his restricted artistic repertoire. He was furthermore responsible for the pursuit of abstract art to its ultimate conclusion, whereupon he directed his attention to volumetric investigations. Since his geometric portfolio embodied a rational integrity and a technological expediency that coincided with the infectious techno-scientific climate of the Machine Age, Suprematism enjoyed widespread currency and was soon imbued with utilitarian and even political dispositions.

In substantiating the principal argument that Cubism acted as the seminal influence on the codification of a modern architectural vocabulary, attention is directed at the volumetric incarnation of Cubism traced, firstly, via Purism.

CHAPTER 7 "AFTER CUBISM": PURISM

7.1 PREFACE

This chapter examines the extent to which the aesthetic initiative, Purism, was derived from Cubism. The next chapter assesses how Purism had induced – via the cubist precedent – the tectonic transformation of the work by the most influential, though enigmatic, architect of the 20th century, Le Corbusier.

7.2 INTRODUCTION

> "Le Corbusier came to architecture through painting ... It [will be to] painters like him – Cézanne, Picasso – that Le Corbusier's name will always be most closely linked, and not with contemporaries like Adolf Loos, or Peter Behrens, or Walter Gropius and Mies van der Rohe; or with Horta, Berlager and Mackintosh ... He was part of a fantastically brilliant family of artists in which his immediate relatives were Braque, Picasso, Léger and Gris; at the head of it was undoubtedly Cézanne." (Gardiner, 1974: 50)

Stephen Gardiner's statement that Le Corbusier shared a closer alliance with the cubist artists than with any of his architectural peers would in all probability be refuted by the majority of scholars of architecture. Not only was Le Corbusier, at the time of the genesis of Purism in 1918, acquainted with the leading figures of the Modern Movement, [1] but he was also assiduously versed in the architectural discourse of the day. Commencing as early as 1914 with the development of Dom-ino [Dom-Ino] as a structural prototype for mass housing, Le Corbusier continued to be concerned with broader social and urban planning issues – although these were more often than not utopian and unrealistic in their implementation. Whilst engaging in the polemics of architecture, Le Corbusier also codified aesthetic principles, which he explored through the media of painting and the written word. The successful reconciliation of the two autonomous aesthetic disciplines bears testimony to his combined genius as architect and artist, endorsed by Gardiner (*ibid.*: 29):

> "It was in the struggle to unite his own extraordinary gifts – those of engineer and painter – and in the realization of a perfect union between the two, that Le Corbusier invented architecture."

However, to imply that Le Corbusier's architecture was derived exclusively from his paintings is somewhat simplistic. This inquiry indicates that his painterly exploits were also approached from an architectural bias. It is more viable to propose that the maturation of his architectural insights had resulted from his exposure to modern art – in particular, to Cubism. His comment, published in *Modulor 2* (1958: 296-297), "It was only in 1919 – at the age of 32 – that I was really able to see the 'architectural phenomenon' ... the secret of my quest must be sought in painting", confirms this view.

Mention has been made of the extraordinary fact that despite Le Corbusier's incessant reference to the impacting role of his paintings on his architecture, hardly any research has been attempted in this field. [2] It is also perturbing that, to date, no chronological view of his painterly *œuvre* has been

---

1 In addition to apprenticeships served with Auguste Perret (1874-1954) between 1908 and 1909, and Peter Behrens (1868-1940) during the following year, Le Corbusier also met Walter Gropius (1883-1969) and Ludwig Mies van der Rohe (1886-1969) in Behrens' office. He met Tony Garnier (q.v.) while working for Perret in Paris, and Josef Hoffmann (1870-1956) in Vienna in 1908.

2 To date, the most comprehensive account on the correlation between Le Corbusier's purist art and purist architecture that has been encountered is Reichlin B., 1997, "Jeanneret-Le Corbusier, Painter-Architect", in Blau, E. and Troy, N. (eds.), *Architecture and Cubism* (Montréal: Canadian Centre for Architecture), 195-218.

compiled. Moreover, a definitive study on Purism does not exist, nor have all its texts been translated into English. These factors – compounded by conflicting information and contradictory translations – contribute to the necessity for a study of this nature, but also to its complexity.

Whilst Purism is acknowledged as an autonomous and noteworthy art movement, Le Corbusier's *peintures puristes* are not generally held in high esteem by the art establishment. In a rare interview, entitled "Meeting with Le Corbusier" and conducted late in his life in April 1962, Viveca Bosson (1995a: 12) comments on the eagerness with which he would talk about his paintings rather than his architecture:

> "He talked with warmth, joy and pride and also with a tinge of bitterness: 'you see, I still paint. This activity does not only restrict itself to the purist period as people seem to think. They are only interested in my architecture!' "

On the authority of Mogens Krustrup (1995: 125), [3] Le Corbusier reiterated at another occasion:

> "People only know me as an architect, they will not recognise me as a painter and yet it is through my painting that I've arrived at architecture."

Bruno Reichlin (1997: 195-196) draws attention to his own translated extract from an article, entitled "Unité", published in *Architecture d'Aujourd'hui* in April 1948, in which Le Corbusier makes the following comment:

> "Here I open a side door into where I live. It gives access to a workshop for patient research. Here is the key to my work ... Inventing forms, creating relationships, proportioning lines, volumes, colours ... These paintings and drawings date to 1920 [1918] when, at the age of thirty-three, I began painting. I have been painting ever since, every day, mastering the secrets of form wherever I can find them, developing the spirit of invention just as an acrobat daily develops his muscle and self-control ..."

The objective of this chapter and the following is to examine the extent to which Le Corbusier's artistic output informed the so-called purist phase of his architecture. This introductory chapter traces the genesis of Purism, specifically in relation to Cubism; acknowledges Ozenfant's contribution; analyzes purist doctrine; and chronologically reviews Le Corbusier's artistic accomplishments from 1918 to 1925. The next chapter concentrates on the architectural transformation of Purism with reference to the formal, conceptual, compositional and spatial correlations between his purist art and purist architecture.

Although beyond the scope of this thesis, it is noteworthy that the distinct changes that occurred in Le Corbusier's architecture during the ensuing decade of *grands travaux* (large works) coincided with the new directions already evident in his paintings after the dissolution of Purism in 1925. The ongoing correspondence between these two disciplines, and in which his paintings, without fail, pre-empt new directions in his architectural output, calls for further investigation. [4]

---

3 Le Corbusier's comment is presumed quoted from his preface "to a short book on Ronchamp", but no further information is provided.

4 See Coll, J., 1996, "Structure and Play in Le Corbusier's Art Works", *AA Files*, no. 31: 3-15, for an account on Le Corbusier's paintings dating from his post-purist period.

7.3 THE GENESIS OF PURISM

> "Purism is the least known of modern movements. It is not one of those now popular movements that you can find ... in paperback – a whole instant movement around R 30 [SAR]. Yet architecturally Purism was the most influential of all modern movements. It shaped the definitive image of the 'International Style' through the work of Le Corbusier." (Guedes, 1988: 23)

Purism, an all-embracing aesthetic movement, was officially launched with the publication of the booklet *Après le Cubisme* (After / Beyond Cubism) by authors Amédée Ozenfant (1886-1966) and Charles-Èdouard Jeanneret (Le Corbusier) in November / December 1918. [5] This event also coincided with the first exhibition of their paintings expounding purist aesthetic theory at Galerie Thomas in Paris.

Ozenfant – eternal scholar, painter, art critic, entrepreneur and distinguished designer – was particularly critical of the lack of sound organizational principles in cubist compositions and had already aired these views in an article, entitled "Notes sur le Cubisme", published in the tenth and last edition of his literary initiative *L'Èlan* in December 1916.

Following the academic exposure of his formative years and his extensive travels, [6] the decorative artist-*cum*-self-taught architect Jeanneret concluded that meaningful artistic expression required an underlying sense of order to ensure visual harmony. As he commented in *L'Art Décoratif d'Aujourd'hui* (1925; 1987: 206, 207):

> "This third chapter [1907-1911] again finds me travelling abroad in quest of the lesson that will clarify my mind, and in an attempt to capture the source of art, the reason for art, the role of art. I acquainted myself with the fashions of Paris, Vienna, Berlin, Munich. Everything about all these fashions seemed to be dubious ... I embarked on a great journey, which was to be decisive [concluding that] Architecture [like art] is in ... everything, sublime or modest, which contains sufficient geometry to establish a mathematical relationship. After such a voyage my respect for decoration was finally shattered."

Ozenfant and Jeanneret met in 1917/8. [7] The discovery that they shared numerous interests and sentiments led to an intellectual collaboration that culminated in the genesis of Purism – initially intended as an artistic initiative, which its authors believed would improve on the pictorial innovations of Cubism and eventually succeed it.

---

5 Some sources cite 9 November 1918 as the publication date of *Après le Cubisme*, whereas others maintain that the manuscript was first submitted for publication on that date. There is consensus, though, that the first purist exhibition was hosted in December, which may well have coincided with the distribution of the booklet as the catalogue accompanying the exhibition.

6 For a comprehensive review of Jeanneret's academic exposures during his formative years with its distinct Platonic and Pythogorean influences, see Turner, P., 1971, "Beginnings of Le Corbusier's Education, 1902-07"; reprinted in Serenyi, P. (ed.), 1975, *Le Corbusier in Perspective* (New Jersey: Prentice-Hall), 18-25. Jeanneret's travels between 1907 and 1911 to Central and Eastern Europe, and Turkey have been recorded extensively. Refer foremost to Le Corbusier, 1923; 1987, *Towards a New Architecture [Vers une Architecture]*, trans. Etchell, F. (New York: Dover). Le Corbusier compiled a recollection of his journeys, entitled *Voyage d'Orient* (Paris), published after his death in 1966.

7 There is conflicting information about exactly where and when Ozenfant and Jeanneret had met. Considering that Ozenfant was a neighbour and friend of Perret for whom Le Corbusier had worked, it is most likely that he introduced them – either at his studio or at a so-called *Art et Liberté* meeting hosted in Paris. Baker, G., 1996, *Le Corbusier – The Creative Search* (London: E & FN Spon), 240, sets the date as May 1917. On the other hand, Le Corbusier, 1925; 1987, *The Decorative Art of Today [L'Art Décoratif d'Aujourd'hui]*, trans. Dunnett, J. (Cambridge, Mass.: MIT Press), 214, states explicitly that he had met Ozenfant in 1918.

Jeanneret adopted the pseudonym "Le Corbusier" in 1920 with the specific intention of distinguishing his artistic pursuits from his architectural career. [8] Ozenfant, in turn, adopted the pseudonym "Saugnier" when they co-authored a series of articles on architecture for their publication *L'Esprit Nouveau* between October 1920 and November 1921. As a result of the wide acclaim that followed when these articles were collectively published as *Vers une Architecture* in 1923, the two pseudonyms gained international recognition. However, it was only from 1928 that Le Corbusier started to sign his paintings as such. As noted before, for the sake of consistency and not to confuse his efforts with those by Pierre Jeanneret, his cousin and partner in his Parisian architectural practice, this thesis will refer to Le Corbusier by his pseudonym. Any deviation reflects the preference of a particular author.

7.4 OZENFANT'S CONTRIBUTION

In order to appreciate the role played by Purism in the development and maturation of Le Corbusier's architectural insights, cognizance must be taken of Ozenfant's contribution. Although Le Corbusier later attempted to minimize, even denigrate, Ozenfant's role, [9] there is little doubt that the inception of Purism can be ascribed to Ozenfant's initiative and intellectual rigour.

Ozenfant was born into a prosperous family from Saint-Quentin in Picardy, France. Although he initially enrolled to study architecture, Ozenfant soon transferred to painting and received a formal art education in the French Beaux Arts tradition, presumably at an institution called La Palette. Described as an inquisitive genius and an intellectual *par excellence*, Ozenfant's diverse range of interests included philosophy, literature, archeology, astronomy, mathematics, photography and music. Well-read and widely travelled, he was considered one of the most scholarly artists of his time. Due to his marriage to a Russian painter in 1908, he lived in St Petersburg until 1910 where he was influenced by the social idealism of the artistic intelligentsia.

As a distinguished racing car driver, Ozenfant designed an automobile body known as the Hispano Alphonse XIII in 1912. His adaptations and modifications, modelled on the Hispano Suiza prototype, considerably improved the car's aerodynamic qualities. The recognition of the correlation between form and function became a life-long conviction, which he duly shared with Le Corbusier.

Since Ozenfant was declared medically unfit to serve in World War I, he launched and financed the successful wartime periodical *L'Èlan* in 1915 as an attempt to sustain developments in French art during that troubled period. Contact with the leading proponents of modern art – including Picasso, Braque, Gris, Matisse and Apollinaire – contributed significantly to his personal development as an artist. Although he considered Cubism to be the most relevant of all the contemporaneous art movements, Ozenfant's aesthetic preferences were strongly informed by Platonic philosophy, hence propagating an artistic expression that adhered to timeless and universal values.

---

8 The pseudonym "Le Corbusier" was derived from the surname "Lecorbes[z]ier" of a distant relative of Jeanneret – altered by Ozenfant in a moment of jest. Le Corbusier means "the raven archer" – a medieval term used to denote the person who shot the birds that soiled the roofs of churches. Jeanneret associated the name with his role as 'purifier' of architecture. Some sources claim that Jeanneret had, prior to 1923, also used the additional pseudonyms "De Fayet", "Vauvrecy" and "Julia[e]n Caron". However, other sources maintain that Vauvrecy and Caron were actually used by Ozenfant, whose other pseudonym "Saugnier" was his mother's maiden name.

9 The first edition of *Vers une Architecture* was published under joint authorship, but all other editions were published in Le Corbusier's name only. This caused Ozenfant considerable dissatisfaction and contributed to the acrimonious dissolution of Purism in 1925. Bosson, V., 1995b, "Le Corbusier – The Architect who became a Painter and Sculptor", in Bosson, V., Von Moos, S., Naegele, D., *et al.*, *Le Corbusier, Painter and Architect*, exhibition catalogue, Nodjyllands Kunstmuseum, Copenhagen (Denmark: Linde Tryk), 50, mentions a letter that Ozenfant wrote to Le Corbusier, dated 9 December 1928, listing his reasons for the dissolution of the friendship, but Bosson refrained from publishing its contents. In a personal interview conducted with Le Corbusier in 1962, Basson, V., 1995a, "Meeting with Le Corbusier", in *ibid.*: 19, comments on how reluctant he still was to discuss Ozenfant.

According to Golding (1994: 142):

> "In the first place [Ozenfant] came to a deep conviction that Cubism was the most serious and valid of recent developments in French painting and embodied the French virtues that he most esteemed: clarity, order, formal control and intellectual astringency. At a wider level he advocated the disciplines involved in the creation of a classically oriented, formalistic art as an antidote to the restless, desperate and occasionally cynical responses of many artists to a period of upheaval and strife."

This Platonic bias, concurring with both his Beaux Arts education and the classicizing predilections of the Groupe de Puteaux, pre-empted the publication of the renowned extract from the *Philebus* on the universal beauty of certain geometric configurations and manufactured objects in the ninth edition of *L'Èlan* in 1916. According to Bosson (1995b: 25), Plato's text had elicited an enormous visual response from the so-called second generation and, presumably, second-rate Cubists who promptly transformed their subject matter into isosceles triangles. Bosson (*ibid.*) maintains that it was this somewhat superficial interpretation of Platonic aesthetic doctrine that led Ozenfant to conclude that Cubism was in the process of deviating from its original premises – degenerating into "a sphere of ornamentation". In the tenth and last issue of *L'Èlan*, Ozenfant denounced the "capriciousness" of Cubism and its arbitrarily determined compositions, stating that the Cubists "seem to forget that their worth lies not in the absence of the depicted, but in the beauty of the composition" (*ibid.*). According to Ozenfant's memoirs (1968; 1973; 10), he had contemplated the formulation of a counter artistic initiative infused with a distinctly Platonic spirit as early as March 1917 – an aspiration he must have shared with Le Corbusier at the time of their fortuitous meeting.

Although intent on a career in architecture, Le Corbusier maintained a lively interest in the visual arts. Having sketched since childhood, his study tours between 1907 and 1911 provided an ideal opportunity to visually record all he experienced. Much attention has been called to the exploratory nature of these chronicles that signify a diverse range of artistic influences, [10] often conflicting with the teachings of his drawing instructor and mentor, Charles L'Eplattenier (1874-q.v.) In his corpus of letters dating from this pre-purist period, [11] Le Corbusier increasingly mentioned the names of modern artists whose work he had encountered and been impressed by. These included the relatively unknown Swiss painters, Cuno Amiet and Adolphe Appia, in addition to Paul Signac (1863-1935), Munch and Matisse. Since no mention is made of any cubist artists, it can be assumed that it was Ozenfant who introduced Le Corbusier to their work. [12] It was only after meeting Ozenfant, who evidently introduced him to the technique of oil painting, that Le Corbusier earnestly committed himself to painting. In the famous letter, dated 9 June 1918, Le Corbusier openly confessed his admiration for Ozenfant, which, undoubtably, caused him excruciating embarrassment later in his life:

---

10 See Von Moos, S., 1995, "Charles Edouard Jeanneret and the Visual Arts", in Bosson, Von Moos, Naegele, *et al.*, *Le Corbusier, Painter and Architect*: 59-82.

11 Le Corbusier's correspondence, dating from 1907 to 1917, is presently housed at the Bibliothèque de la Ville, La Chaux-de-Fonds, but has never been published in full. Von Moos (*ibid.*: 81) claims that his translated extracts from these letters had, prior to 1995, never been published in English. Refer specifically to Le Corbusier's correspondence with L'Eplattenier, referred to on pages 69, 71 and 72, in which he informs his tutor of his new artistic insights.

12 In a letter quoted by Baker (1996: 240), dated 24 January 1918 and addressed to one William Ritter, Le Corbusier not only mentions Ozenfant by name, but he refers also to Cubism, which he calls "truly beautiful", stating, "What strange lessons one learns in Paris".

> "All is confusion in me since I started sketching. Throbs of blood push my fingers in arbitrary ways, my reason no longer controls ... In my confusion I think of your clear, quiet will-power. An abyss of time divides us. I am on the threshold of study, you are putting theories into practice ..." [13]

Following a sojourn at Andernos in September 1918, Ozenfant and Le Corbusier started to work together. This intimate relationship, extending over a period of seven years, effected the lives and careers of both. Ozenfant's interest in the literary achievements of Graeco-Roman antiquity and, in particular, Platonic doctrine, coincided with the philosophical premises that had intrigued Le Corbusier since his formative years at La Chaux-de-Fonds in Switzerland. Le Corbusier's architectural career not only corresponded with Ozenfant's experiences as a designer, but expanded the focus of Purism way beyond the visual arts and mere artistic considerations.

However, Le Corbusier's rise to fame as an architect of international standing had an adverse affect on their friendship, exacerbated by the financial difficulties experienced by *L'Esprit Nouveau* from 1924. Following a disagreement in 1925 over the display of the La Roche art collection at *Maisons La Roche-Jeanneret*, Ozenfant and Le Corbusier parted ways. [14] Although Ozenfant managed to pursue an artistic career independent from Le Corbusier, he was never recognized as a major artist in his own right. Much to the dismay of art critics, his work from the late 1920s became increasingly figurative. He was, though, held in high esteem as an art teacher and academic, corroborated by the wide acclaim received by his book *Art*, published in 1928, of which the English translation *Foundations of Modern Art* appeared in 1931. He left France in 1936, settled in the USA in 1939 where he worked and taught until 1955. He thereupon returned to France but, due to his long absence, he was unable to regain his former esteemed position in the art world and died in relative obscurity in 1966.

7.5 PURIST DOGMA

7.5.1 Purism as a Counteracting Artistic Initiative

Purism was a highly ambitious but brief movement, lasting from 1918 until 1925. Unlike the creators of Cubism – Picasso and Braque – the Purists wrote extensively and illustrated the application of their theories by a myriad of drawings and paintings. Although widely exhibited in its lifetime, [15] it was essentially as a result of Le Corbusier's architectural accomplishments that Purism received due consideration and was recognized as an autonomous art movement. The Purists are, however, still credited by contemporary art historians with having levelled some of the most valid criticism at Cubism. According to Fry (1966: 176):

> "There have been surprisingly few attempts thus far at a critical and historical evaluation of cubism. The first was Ozenfant's and Jeanneret's *La Peinture Moderne*, Paris, 1925, based on a series of articles in their review *L'Esprit Nouveau*. While inevitably prejudiced in favour of their own aesthetic interests, they did however give a broader view than many more recent critics, and they saw correctly that cubism continued as a living style until the mid-1920s; they also saw 1912 as a moment of decisive change, but over-emphasized the role of Cézanne in pre-1914 cubism."

---

13 There are several English translations of this particular letter. This extract is taken from Jencks, C., 1973, *Le Corbusier and the Tragic View of Architecture* (London: Penguin), 50-51, which he sourced from Ozenfant, Nov. 1965, *Aujourd'hui Art et Architecture* – but the letter may well have appeared in print some time before that date.

14 For a detailed account of the La Roche incident, see Benton, T., 1987, *The Villas of Le Corbusier, 1920-1930* (New Haven: Yale Univ. Press), 67, 70.

15 Apart from the first purist exhibition at Galerie Thomas in 1918, another was hosted at Galerie Druet in 1921 and at the Salon d'Automne in 1922, all in Paris. Green, C., 1991 ed., "Purism", in Stangos, N. (ed.), *Concepts of Modern Art* (London: Thames & Hudson), 79, mentions that purist paintings were shown "from Paris to Prague" between 1918 to 1925, but refrained from being more specific.

When considered purely from an artistic point of view, it is clear that Purism was a counteracting initiative, entirely indebted to the spatial and pictorial innovations of Cubism. Ozenfant and Le Corbusier did acknowledge their dependence on Cubism in *Après le Cubisme* and expressed explicitly their admiration for, specifically, its analytical phase. They maintained that the work produced by Picasso and Braque between 1910 and 1912 encapsulated the essence of a modern artistic expression because it emphasized the rudimentary principles of art, particularly regarding form (Golding, 1994: 143).

However, they inferred that during the synthetic phase of Cubism, the semiotic content of the pictorial reconstructions took precedence over the formal significance of the subject matter, and that the supposedly unwarranted distortions falsified reality. They also claimed that the creative freedom induced by the novel process of synthesis and reassembly was unsubstantiated by any rational means of compositional organization. Moreover, due to its allegedly compositional chaos and romantic disorder, Cubism had degenerated into a decorative, pictorial style (*ibid.*: 144).

They were eminently critical of the fact that the Cubists, especially Picasso and Braque, [16] did not address the prevailing industrial *Zeitgeist* – an opinion shared by the Futurists. (This criticism is somewhat short-sighted considering the revolutionary space-time dimension that Picasso's *Les Demoiselles d'Avignon* had introduced to the plastic arts, which Le Corbusier only acknowledged many years later.)

In view of their interest in Platonic philosophy and Pythagorean numerology, the Purists also maintained that Cubism did not take advantage of the latent possibilities of form and, consequently, the conceptual significance that the Purists' attributed to form *per se*. Hence their claim to take Cubism to its logical conclusion (Green, 1991: 79), and their advocating a more rigourous artistic approach according to which pictorial composition would be structurally disciplined and purified form [17] would be celebrated. In the words of Stanislaus von Moos (1979: 40):

> "Purism, in short, was an avant-garde movement only in the broadest sense of the word. Its outlook was idealistic and restorative. It glorified order, logic, culture and technological progress."

7.5.2 L'Esprit Nouveau

Following the publication of *Après le Cubisme*, Ozenfant, Le Corbusier and poet Paul Dermée founded the periodical *L'Esprit Nouveau – Une Revue Internationale d'Esthétique* in October 1920. Whereas the former had served largely as a critique on Cubism, the editorial commentary in the latter communicated purist contentions with a fervour similar to other contemporaneous artistic manifestoes. *L'Esprit Nouveau* was soon recognized as one of the most influential publications of the 1920s. Its twenty-eight issues featured avant-garde tendencies in the artistic, literary and musical arenas, and also

---

16 Despite their criticism levelled, specifically, at Picasso and Braque, the Purists had great affinity for the work of Léger and Gris, whose approach to composition was not much different from their own. The admiration must have been mutual considering that Léger, according to Boesiger, W., 1972, *Le Corbusier, Works and Projects* (Barcelona: Ingoprint), 248, gave a lecture on Le Corbusier's architecture in Berlin in 1928. Paintings by Gris and Léger were exhibited together with those by Le Corbusier and Ozenfant at the Pavillon l'Esprit Nouveau in 1925.

17 The reference "pure form" is ambiguous. Although Platonic by association, the Purists never actually used the Platonic Solids, according to academic definition. Instead, in *Vers une Architecture* (1923; 1987: 159), Le Corbusier identified the primary range of Euclidean geometry – the cube, cuboid, sphere, cylinder and pyramid – as the essence of purist vocabulary. Consequently, "purified form" refers in a literal sense to the Purist's process of reducing natural or man-made artefacts to Euclidean geometry.

included topics as diverse as psychology, sociology and the latest developments in science. Bosson (1995b: 42) provides the following assessment:

> "Collaboration and transgression between different art forms had already existed as [an] idea and had spread to futurism, Bauhaus, neoplasticism etc. But it was not until the appearance of *Esprit Nouveau* that these ideas came to a sonorous expression within the areas of experimental aesthetics such as painting, sculpture, literature, music, film, theatre, fashion, books, furniture, sport and the entire aesthetics of modern life."

Since Ozenfant and Le Corbusier had already announced that "a new spirit prevailed" in the introduction of *Après le Cubisme*, the title of their new periodical seems an obvious choise. According to Fry (1966: 171), it was derived from an essay by Apollinaire, entitled "L'Esprit Nouveau et les Poètes", written in 1918 in response to the novel ballet performance "Parade" of which the music was composed by Eric Satie (1866-1925) and the sets designed by Picasso. Yet, the poetic freedom that Apollinaire associated with the term assumed a more explicit meaning for the Purists. Banham (1960a; 1996: 207) mentions that the phrase had already been employed by Choisy, but that "it was a slogan that gratified the sensibilities of several aspects of the Parisian *avant-garde*, and carried implications that ranged from Futurist to Classicist, as did the contents of the magazine itself ".

Although intended, as the subtitle of *L'Esprit Nouveau* suggests, to be an aesthetic review, [18] coverage soon included all aspects pertinent to modern life and the industrial *Zeitgeist*. To the Purists, the new spirit both anticipated and encompassed a society that would optimize its technological potential, celebrate the Machine Age, and establish a culture that promotes a purist-inspired design integrity in all the artistically-related arenas. These ambitions are paraphrased by Frampton (1980: 152) as "nothing less than a comprehensive theory of civilization". Bosson (1995b: 42) maintains that "Purism as a movement wanted to be in the service of mankind, and not limit itself to aesthetics. The expansive power of the new attitude, which was born of post-war optimism and a will to resurrect, spread to all areas of art and in every cultural sphere." The definition of Purism by Deborah Gans (1987: 180) as a "cultural aesthetic" is, in the final analysis, the most fitting description of this all-embracing modern movement.

On the one hand, Purism was an artistic initiative that aimed at the rationalization of the intuitive endeavours of the Cubists according to certain quasi-scientific precepts – a "cubist fundamentalism", in the words of Reichlin (1997: 210). On the other hand, Purism comprised a substantial ideological component that extended its doctrine way beyond mere artistic considerations. As confirmed by art historian Christopher Green (1991: 84), it was ultimately through the manner in which artistic and utilitarian premises were synthesized into a plausible aesthetic dogma – and exemplified through the medium of painting – that Purism demonstrated its independence from Cubism and other contemporaneous art movements.

7.5.3 Purist Artistic Theory

Before reviewing Le Corbusier's paintings, an analysis of purist artistic theory is deemed necessary. Although the term "artistic" pertains to aesthetic considerations, the distinction between artistic theory and aesthetic theory is deliberate in order to emphasize those postulates relating, specifically, to the act of painting.

---

18 It is noteworthy that in the English edition of Le Corbusier, 1925; 1987, *L'Art Décoratif d'Aujourd'hui [The Decorative Art of Today]*, 214, the subtitle of *L'Esprit Nouveau* is translated by Dunnett as "an international review of contemporary activity", rather than an aesthetic review.

Purism was, foremost, a highly contemplated and calculated endeavour. This can partly be ascribed to the reactionary stance it had adopted in relation to an existing precedent, and partly to the nature of the philosophical premises with which it had aligned itself. It also happens to be one of the few modern art movements that explicated its conceptual position before putting pencil to paper – a strategy pertinent to architecture. However, such a creative predisposition invites critical scrutiny, particularly when its artistic realizations do not live up to expectations – a criticism often levelled at purist painting.

Since the Purists had claimed that Cubism had no well-defined theory (Ozenfant, 1928; 1952: 79), they, by contrast, developed a comprehensive theoretical doctrine – albeit often contradictory and ambiguous. Its complexity is compounded by the poetic quality of the written text, distinctive of both Ozenfant and Le Corbusier. Although appreciating the reductive methodology of Cubism and utilizing their practice of pictorial simultaneity to great effect, the principal theoretical arguments of Purism focussed on the perceived deficiencies of Cubism. These included, firstly, the lack of sound compositional organization and, secondly, the failure to conceptually respond to, or artistically reflect, the industrial *Zeitgeist*. These views find corroboration in Ozenfant's retrospective remark (*ibid.*: 117):

> "We laid down the foundations for a Purism that would bring order into the aesthetic imbroglio, and inoculate artists with the new spirit of the age misapprehended by so many of them."

7.5.3.1 Compositional Order

i) Le Rappel à l'Ordre

In opposition to the intuitively determined compositions of the Cubists, the Purists' principal artistic postulate concerned the establishment of pictorial order – intrinsically a continuation of the prevailing neo-Platonic discourse, initiated by the Groupe de Puteaux via Marinetti and Severini.

The Purists were adamant that order was a prerequisite to attain visual equilibrium. In substantiating their "call to order" (*rappel à l'ordre*, coined by Jean Cocteau), the Purists advanced a theory that Man aspires instinctively to the harmony prevailing in nature – equating the quest for order with an intrinsic human need to create harmony (Green, 1991: 81). [19] In the words of Green (*ibid.*):

> "[According to the Purists] this order constantly found in our surroundings and our actions satisfies a genuine human need – the need of our minds to conceive equilibrium and our senses to perceive it".

Following this train of thought, it was argued that the organization of the artistic composition had to correspond with the ordering systems exemplified in the numerological structure of the universe, since only this accomplishment could ensure the desired state of visual harmony. Thus, the status of proportion was reaffirmed, and classical proportioning systems were reinstated as the exclusive means of organizing the pictorial content on the painterly surface.

ii) The Science of Composition

> Concurring with the classical ideal of beauty, the Purists propagated a notion of aesthetic certainty and defined art in terms of specific constants. Green (*ibid.*: 80) comments:

---

19 With reference to Ozenfant, A., 1923, "Ce Mois Passé", *L'Esprit Nouveau*, no. 19; Ozenfant, A., 1924, "Certitude, no. 1", *L'Esprit Nouveau*, no. 22; and Ozenfant, A., 1925, "Certitude, no. 2", *L'Esprit Nouveau*, no. 27.

> "The Purists were strict rule-makers: their focus [was] on constant factors ... Their aim was to give art an unchanging foundation, and in this sense they were classical."

However, unlike the Classicists, the Purists never claimed that their art presented a universal truth. Instead, Purism embodied a visual validity, corroborated by a so-called science of composition. In the essay entitled "La Tendance vers le Cristal" (1925; 1966: 170-171), [20] Ozenfant states that "the true cubists ... will end by achieving a real virtuosity in the play of forms and colours, as well as a highly developed science of composition". This scientific composition enabled the desired sense of visual harmony that corresponded with the laws of the universe – "those laws", according to Ozenfant (*ibid:* 171), "which human reason loves to propound in order to explain nature". He was, moreover, of the opinion that "man takes delight in geometric forms because he finds in them what seems to be a confirmation for his abstract geometric concepts".

Convinced that "man is animated by a geometric spirit", the Purists inferred in the article "Le Purisme", *L'Esprit Nouveau*, no. 4 (1921), that a "work of art should provide a sensation of mathematical order ... and the means by which this order is achieved should be sought in universal means" (Baker; 1996: 242). These universal means allude to, firstly, divine proportion and, secondly, pure, Euclidean, geometry. In turn, the artistic composition can be qualified as the numerological organization of the subject matter according to certain metaphysical conventions, which, supposedly, give rise to the "objectivization" of both subject and art. This is paraphrased in "Le Purisme" as follows:

> "A painting is a whole (unity); a painting is an artificial formation which, by appropriate means, should lead to the objectivization of an 'entire' world." (Reichlin, 1997: 197)

Ozenfant furthered this 'objectifying disposition' – qualified as *la tendance vers le cristal* – in the essay with the same name.

iii) The Grammar and Syntax of Visual Sensation

In addition to the science of composition, a so-called grammar and syntax of visual sensation were advanced as the foundation of art. [21] Syntax referred to the mathematical system adopted to govern the structure of the artistic composition. Geometry, form, line and colour constituted the grammar of the visual language. This language was considered universally comprehensible since it was based on invariable optic sensations – "the unchanged physiological structure of the eye, mind and body" (Green, 1991: 82) – irrespective of time, culture or place. However, only when the pictorial content had been depicted in its 'purest' state, would our sensory experiences be collective and would the artistic vocabulary qualify as so-called plastic constants. These views, expanded upon in "Sur la Plastique", *L'Esprit Nouveau*, no. 1 (1920) and "Le Purisme", were already present in *Après le Cubisme* of 1918, as this translated extract from Banham (1960a; 1996: 207) indicates:

> "The aim of pure science is the expression of natural laws through the search for constants. The aim of serious art is also the expression of invariants ... The work of art must not be accidental, exceptional, impressionist, inorganic, protestatory, picturesque, but, on the contrary, generalised, static, expressive of the invariant."

---

20 See the translated version of Ozenfant, A., 1925, "La Tendence vers le Cristal", *La Peinture Moderne* (Paris), reprinted as "Towards the Crystal", in Fry, E. (ed.), 1966, *Cubism* (London: Thames & Hudson), 170-171.

21 See Green, 1991, "Purism": 82; and Baker, 1996, *Le Corbusier – The Creative Search*: 240-243, with reference to Ozenfant, A. and Jeanneret, C-E., 1921, "Le Purisme", *L'Esprit Nouveau*, no. 4.

Coinciding with Plato's convictions that certain stereometric configurations constitute absolute beauty, geometry was identified as the basis for the artistic composition, with its significance echoed consistently in all purist publications. As Le Corbusier noted in *L'Art Décoratif d'Aujourd'hui* (1925; 1987: 112):

> "Ordered! Let us reflect for a moment on the fact that there is nothing in nature that, as seen objectively by our eyes, approaches ... pure perfection ... If we say with certainty: nature is geometrical, it is not that we have seen it; it is that we have recognized it, that we have interpreted it in accordance with our [intellectual] framework ... If we pick up a polished pebble, choosing the roundest among the million of others ... it is because we aspire to the attainment of geometry ... Geometry and gods sit side by side ..."

Form – as the three dimensional extrapolation of geometry – was categorized as either primary or secondary: either considered unequivocal, timeless and devoid of any distracting associations, or not (Green, 1991: 82). [22]. Colour, qualified as a so-called surface factor, was supposedly subordinate to form because its integrity can easily be destroyed as the Impressionists succeeded in doing (*ibid.*). [23] Colour and tonal differentiation were adopted to emphasize the volumetric propensity of the subject matter, and also to reinforce the hierarchy of the composition, which, in turn, was established by the invariably stable dominance of (vertical and horizontal) line. Consider Banham's translated extract (1960a; 1996: 210) from *La Peinture Moderne* (1925), as first explored by the Purists in "L'Angle Droit", *L'Esprit Nouveau*, no. 18 (1923):

> "The vertical and the horizontal are – among the sensorial manifestations of natural phenomena – verifications of one of the most directly apparent laws. The horizontal and the vertical determine two right angles, out of the infinity of possible angles, the right angles is the angle-type; the right angle is one of the symbols of perfection."

Contrary to expectations, the artistic palette of Purism was not restricted to the exclusive use of either primary forms or colours, nor confined to linear constructions as the Neo-Plasticists had done, and displayed a greater degree of creative flexibility than one would expect. However, misleading colour associations had to be avoided, such as the inappropriate and supposedly erroneous use of blue to convey the solidity of an object. An initial preference for warmer tones was later expanded to multichromatic colour schemes, often contradicting earlier statements. [24]

In their seminal essay "Le Purisme" (1921), the Purists stated their artistic objectives as follows:

> "Purism aims at an art making use of plastic constants, avoiding conventions, addressing itself first and foremost to the universal properties of the senses and the mind ... to achieve harmony ought to be the only goal." (Baker, 1996: 242)

7.5.3.2 Utilitarian Order

No matter how definitive their formal language in response to the pictorial deficiencies of Cubism, the Purists had only yet codified the artistic framework of their painterly pursuits, the narrative still had to be determined. Green (1991: 83) points out:

---

22 With reference to Ozenfant, A. and Jeanneret, C-E., 1920, "Sur la Plastique", *L'Esprit Nouveau*, no. 1; and Ozenfant, and Jeanneret, C-E., 1921, "Le Purisme".

23 *Ibid.*

24 See Green, C., 1987, *Cubism and its Enemies* (New Haven: Yale Univ. Press), 90-91, for a discussion on the discrepancies between purist theory and purist paintings, particularly with regard to colour.

> "So full a development of a formal language, and so strong an emphasis on the abstract ideals of harmony and precision, might seem to lead somewhere very different from the bottles and guitars of purist paintings: a strictly architectural painting seems at first the most logical result – an elaborate but muted version of De Stijl. Yet, Purism's insistence on the old subject matter of Analytical and Synthetic Cubism is no mean compromise; it, too, is the result of a strict investigation of the means and ends of art."

i) La Sélection Naturelle, La Sélection Mécanique

In response to the Cubists' failure to address the prevailing *Zeitgeist* and coinciding Machine Age, the Purists expanded their artistic focus by facilitating utilitarian considerations, identifying Functionalism as their principal conceptual point of departure.

By extending their preoccupation with order and harmony, the Purists inferred that all scientific enquiry is motivated by the sustained quest for order, and the need of our minds to conceive or create equilibrium (Green, 1991: 83-84). [25] Moreover, the authors argued that all scientific discoveries relate, in one way or another, to nature. Technological inventions – the machine, in particular – are the physical manifestations of this ongoing process of enquiry into nature. Accordingly, science and the machine were equated with nature since they collectively respond to the identical laws of harmony, selection and economy. Consider the following translated extract from *La Peinture Moderne* (1925):

> "Purism has brought to light the Law of Mechanical Selection [*sic*]. This establishes that objects tend toward a type that is determined by the evolution of forms between the ideal of maximum utility, and the satisfaction of the necessities of economical manufacture, which conform inevitably to the laws of nature." (Banham, 1960a; 1996: 211)

Concurring with Classicism, the human body (as the primary exemplar of nature) was, yet again, sourced as the most convincing demonstration of this disposition (Golding, 1994: 143-144). [26] In addition, the human body illustrates not only one, but two, underlying systems of order. The human physique, on the one hand, is an obvious embodiment of compositional order due to the harmonious, numerical relationships of the respective (body) parts to the whole. Human anatomy, on the other hand, reveals a utilitarian sense of order: the format of the different organs is the result of continuous, evolutionary adaptations to functional requirements. Due to this tendency towards greater economy of effort, an equally harmonious relationship is established between the function of the organ and its corresponding and resultant format. The correlation between form and function due to 'economical effort', was qualified as the "principle of selection", termed *sélection naturelle* – when demonstrated in natural phenomena – and *sélection mécanique* – when applicable to man-made, mechanical artefacts.

Thus, the Purists propagated what Golding (*ibid.*:144) terms an "up-to-date mechanized form of Classicism", and had established the conceptual criterion for selecting and identifying the subject matter of their paintings. This is explained in "Le Purisme" (1921) as follows:

> "Primary forms and colours have standard properties (universal properties permitting the creation of a transmissible plastic language). But the use of primary forms does not enable the artist to put the spectator in the desired mathematical state. For that he has to call on associations of natural or artificial forms, and in choosing them the criterion is the degree of selection at which certain elements have arrived (natural selection and mechanical selection)." (Baker, 1996: 242)

---

25 With reference to Ozenfant, 1924, "Certitude, no. 1"; and Ozenfant, 1925, "Certitude, no. 2". See also Le Corbusier, 1923; 1987, *Towards a New Architecture*; and Le Corbusier, 1925; 1987, *The Decorative Art of Today*, for the role of the machine and technology in society.

26 With reference to an unspecified article by the purist authors published in 1923/4 in *L'Esprit Nouveau*, no. 21.

ii) Objets-Types

The Purists subsequently identified specific artefacts which not only demonstrated this conceptual premise, but also epitomized *l'esprit nouveau*. Hence mass-produced, "tools of the industrial culture" – qualified as *objets-types* – were selected as the artistic means with which to convey their theories. Drinking glasses, laboratory flasks, bottles, musical instruments, books, smoking pipes, reading glasses, and so forth, were identified as those objects that encapsulated the utilitarian sense of order, and that adhered to the principle of mechanical selection. These *objets-types* contained no superfluous appendages since they had evolutionary been 'purified' in response to specific utilitarian requirements – form following function in the most puritanical sense of the definition. In the words of Green (1991: 83):

> "The bottles and guitars of Purist paintings are therefore objects in which order has been found. The qualities of that order are clear, for the objects of Purist paintings are of course 'objets-types'. They are qualities of a humanist functionalism: the qualities that follow from absolute efficiency – precision, simplicity and proportional harmony."

This reasoning explains the Purists' preoccupation with subject matter similar to that of the Cubists, which, particularly during the analytical and synthetic stages of Cubism, often qualified as *objets-types*. However, to the Cubists the conceptual significance of the subject matter was incidental. The subject matter was simply a means to an end; a vehicle that illustrated an artistic process. The Purists, by contrast, maintained that <u>their</u> subject matter encompassed an intellectual significance that exceeded artistic purposes. Consequently, art that explored formal themes only was dismissed as ornamental, and was said to display the artist's inability to grasp and give expression to the order displayed in the supposed disorder of his immediate surroundings (*ibid.*). Therefore, the compositions of bottles and guitars depicted by Ozenfant and Le Corbusier were not only structured differently, but were also painted for completely different conceptual reasons than those by Picasso and Braque. Furthermore, purist paintings synthesized two independent, though interrelated, manifestations of order: firstly, a utilitarian <u>notion</u> of order – demonstrated in the selection of the subject matter and, secondly, the customary, compositional <u>system</u> of order – exemplified in the structuring of the pictorial organization.

Due to the prominence given to the machine in the crystallization of purist theory, the question arises as to why no mechanical device was ever reproduced in their paintings as the Orphists and the Futurists had done. Although incessantly extolling the virtues of the machine – the epitome of the new spirit and ethos of precision – it was never considered an *objet-type*. It was argued that the machine could never exist as a constant value amidst ever-changing, advancing technology, and it would always be superseded by another and more effective model (*ibid.*: 82). Even though the *objet-type* was expendable (metaphorically referred to as "a machine for drinking", "a machine for reading", etc.), it qualified as a formal <u>invariable</u>, whereas the machine did not – hence its disqualification as an *objet-type* and, consequently, as a subject for portrayal.

Despite the fact that the human figure exemplifies <u>both</u> systems of underlying order, the Purists also refrained from its portrayal because it too easily appeals to subjective interpretation. *Objets-types*, on the other hand, are devoid of any distracting associations and exist, furthermore, as <u>industrialized</u>, generic prototypes – a criterion obviously <u>not</u> met by natural phenomena. Consider the following rationale presented in *La Peinture Moderne* (1925):

> "... Purism begins with elements chosen from existing objects, extracting their most specific forms. It draws preference from among those that serve the most direct of human uses; those which are like extensions of man's limbs, and thus of an extreme intimacy, a banality that makes them barely exist as subjects of interest in themselves, and hardly lend themselves to anecdote ... This double play of [the] laws [of mechanical selection] has resulted in the

> creation of certain number of objects that may thus far be called standardised ... Purism has thus far limited its choice to these objects." (Banham, 1960a; 1996: 211)

Ozenfant and Le Corbusier did, however, start to introduce natural phenomena – the female figure, in particular – to their paintings from approximately 1926, although by then these two artists were working independently. The emergence of so-called *objets à réaction poétique* (objects of a poetic reaction) signified a dramatic change in both attitude and doctrine: Purism had run its course.

In summary, Purism materialized in reaction to the ostensible deficiencies of Cubism. Purist artistic doctrine consisted of two distinct components: the one *à propos* pictorial conventions, the other in reference to conceptual considerations. These premeditated criteria both motivated and substantiated the choice of purist subject matter, and also provided the pictorial framework for its depiction according to certain hierarchial distinctions and metaphysical canons. Given this mindset, the Purists, according to Baker (1996: 243), considered the abstract compositions of Mondrian and Kandinsky flawed because they had only established "a framework for [painterly] action" and did not pursue it beyond that. It was ultimately the conceptual approach to the object – the utilitarian significance ascribed to the subject matter – that heralded the artistic autonomy of Purism. In the words of Green (1991: 83-84):

> "The subject-matter of their still-lifes ... [puts] their painting into direct contact with the practical world of engineering ... constructing a bridge between the practical and the aesthetic spheres ... A firm grip is kept on their 'objet type' starting point and in this way the practical order of functional efficiency is joined to aesthetic order: cubist method loses all trace of ambiguity: it becomes the instrument of a philosophy as all-embracing as De Stijl, but independent of it."

7.5.4 Purist Aesthetic Doctrine

The principal tenet of purist philosophy concerned the establishment of order – not only the creation of order, but also the recognition thereof. Presumably, one can only create (or re-create) order once it has been recognized. The notable distinction to create order – instead of beauty – was an aspect central to the crystallization of purist aesthetic doctrine.

The Purists' admiration for the visual harmony inherent in edifices of Greek antiquity, coupled with their deep-seated commitment to the *Zeitgeist* of 20th century, inspired their desire to formulate a latter-day aesthetic doctrine based on universal canons (amplified by the lack of order in cubist compositions). The synthesis of the metaphysical numerology of Pythagoras, Platonic doctrine of Ideal Form, and the Periclean order (as referred to by Geoffrey Baker, 1996: 242) demonstrated in the Parthenon, provided the Purists with the intellectual impetus for developing their own theoretical position in relation to an industrial phenomonology.

On the authority of Bosson (1995b: 32), the Purists' qualified beauty as "the resonance within us through which we experience purity and the regulated order of things". According to such a definition, aesthetic appreciation was the emotive recognition of the numerological order exemplified in the structure (or compilation) of nature and certain man-made artefacts, which, supposedly, appeals instinctively to our aesthetic sensibilities. From their discovery that the entities that met their first aesthetic criterion were also utilitarian (the human body being the prime example), emerged the Purists' seminal theoretical position with regard to Functionalism. Consequently, their definition of beauty was verified – if not expanded – by the example of functional adaptation. Therefore, man-made artefacts that embody the process of formal purification – arrived at via mechanical selection and economical effort in response to their respective functions – would qualify as symbols of beauty and perfection. In an interview Bosson (*ibid.*: 34) conducted with Ozenfant during "the 1960s", he commented that "If

blind nature, which has created the egg, was to produce bottles it would probably shape them the same way a machine created by human intelligence does". Bosson (1995b: 34) heeds that this assumption coincided with the viewpoint of philosopher Thomas Aquinas (1225-1274) that "art should imitate nature in its mode of operation", and also finds support in the words of German phenomenologist Max Scheler (1874-1928) that "even the useful becomes beautiful when its usefulness has been perfected".

Green (1991: 81) is of the opinion that purist aesthetic theory can be regarded an extension of Renaissance Humanism because of the consideration to the interpretation of Man's basic needs (equated with the quest for order and harmony). Green qualifies the Purists' position with regard to function as a humanist Functionalism and draws attention to the fact that Purism had "brought into being a humanist art without the human figure". Bosson (1995b: 34), on the other hand, refers to a metaphysical Functionalism, stating that "it is here that the Purists move onto a metaphysical level: it is not a question of utility, but about that which, through perfection itself, surpasses the spheres of rational points of view and thereby emerges in the realm of beauty". Her presupposition finds corroboration in a statement by Le Corbusier from an early article, entitled "Vers une architecture", dated 1918, but evidently published in *L'Esprit Nouveau* in 1920/1:

> "It is not a question of utility ... Architecture lies beyond the utilitarian ... through the linking of forms the architect [or the artist] awakens deep resonance within us. He provides us with an order's objective that is felt to coincide with an order in the world, it fosters different feelings in heart and spirit; it is here that we experience beauty." (*ibid.*: 32)

To the Purists, Functionalism was not merely a yardstick of utility. It was a consideration with a distinct aesthetic component by means of which the *Gestalt* of the object had been perfected in response to its function. (The value judgement inherent in 'perfection' was somewhat unconvincingly qualified. However, the Purists did stipulate that harmony of proportion should serve as an additional, if not final, consideration. [27] Stylistic [or formal] variation meeting this 'proportional criterion', was an aspect neither Le Corbusier nor Ozenfant cared to consider or expand upon.) It was ultimately the harmonious correspondence between form and function that was considered beautiful, and not the object *per se*. In other words, the object is beautiful only when the correlation between its function and formal appearance has been perfected; when the inherent need to create order has been satisfied; and the aspiration to create harmony has been established. Hence the Purists' equation of the Parthenon with Einstein's calculations (Green, 1991: 81), [28] since both endeavours fulfil the same basic human desire: the need of our minds to conceive equilibrium (Einstein) and the need of our senses to perceive it (the Parthenon). Thus, the same of beauty attributed to the Parthenon was extended to the ordered thinking of Einstein.

It is therefore task of the artist, the architect, the engineer, and even the scientist, to create order and harmony – the man-initiated processes through which we can arrive at, or experience, beauty. These contentions find support in Le Corbusier's comparison in *Vers une Architecture* (1923; 1987: 85-148) of the Parthenon with engineered phenomena – the automobile, aeroplane and ocean liner – since these artefacts demonstrate collectively the corresponding notions of order, harmony and beauty. In their very first purist publication, *Après le Cubisme* of 1918, the authors stated that "We can achieve our own Parthenon, because our epoch is better equipped for reaching the ideal of perfection than it was at the time of Pericles" (Bosson, 1995b: 29) – sentiments that were echoed in *Vers une Architecture*.

---

27 Green (1991: 82) cites an example, presumably from Ozenfant and Jeanneret, C-E., 1921, "Le Purisme", regarding different bridges that are all equally effectively designed. The engineer becomes an 'artist' when he selects the one most harmonious in its proportions.

28 With reference to an unspecified article by the purist authors published in 1923 in *L'Esprit Nouveau*, no. 19.

The 'true' artist is the one who can instinctively recognize and give expression to these harmonious manifestations – "a medium", according to Bosson (1995b: 33), "whose task it is to reveal the beauty of this world". Such reasoning explains why the Purists never abstracted their subject matter beyond recognition. Any such attempts would have obscured the conceptual significance of their 'transmitters of beauty'. Green (1991: 79) points out:

> "What Cocteau dubbed 'The call to order' was [met] by Ozenfant and Jeanneret with fervour, a feeling of revolutionary purpose, and a full appreciation of cultural guerilla tactics."

Thus, the Purists succeeded in establishing an aesthetic criterion that was not only applicable to the identification and portrayal of artistic subject matter, but also pertinent to the creation of artefacts and, in particular, the design of buildings. At the same token, just as the house was qualified as a machine for living, purist painting was regarded a *machine à émouvoir* – a machine provoking emotion. As an aesthetic mechanism, purist paintings celebrated the accomplishments of contemporary life and industrialized society, as well as epitomizing the universal canons of beauty.

7.6 PURIST PAINTING

7.6.1 Introduction

In order to evaluate the application of these elaborate theoretical points of view, and also to be able to assess the corresponding influence between Le Corbusier's artistic pursuits and his architecture, a chronological review of his purist paintings is deemed necessary.

The following analysis is restricted to Le Corbusier's paintings, which, during the initial stages of Purism, were very similar to those by Ozenfant. It was only from 1923 that a difference in their respective approaches became noticeable. Nonetheless, their fundamental aesthetic premises remained the same. Although no complete overview of Le Corbusier's paintings has been encountered to date, it was possible to examine a reasonably comprehensive body of work, but derived from different sources. The most notable included the catalogue from the retrospective exhibition on Le Corbusier's artistic and architectural achievements, hosted at Palazzo Strozzi in Florence in 1963, and a catalogue from a more recent exhibition, entitled "Le Corbusier, Architect and Painter", hosted in Copenhagen in 1995.

Based on available data, purist painting can be divided into three stages:

The inception of the first period, dated, for the purposes of this study, from 1918 to 1919, coincided with the publication of *Après le Cubisme* and consequently focussed on the formal integrity and actuality of the subject matter. It was also the most rudimentary and representational phase of purist painting, only starting to address compositional organization.

The second period, dated from 1920 to 1921, coincided with – if not pre-empted – the publication of purist aesthetic doctrine in *L'Esprit Nouveau*. It is generally regarded as the mature stage of Purism as all the unsatisfactory pictorial relationships experienced during the previous phase had been resolved. This phase consisted of the juxtaposition and distillation of the subject matter, concurring with the analytical stage of Cubism.

The third and last period dates from approximately 1922 until the official dissolution of Purism in 1925. This stage is comparable to the synthetic stage of Cubism in that the disintegrated, fragmented subject matter was reassembled into complex, graphic compositions. In the case of Le Corbusier, the end date can be extended to 1927, since his pictorial explorations during the two years after 1925 continued along similar lines.

It is important to note the following:

1. As comprehensive as the theoretical component of Purism was documented, it would be erroneous to assume that these postulates were clarified, or even articulated, right from the outset. Although the showing of the first purist paintings by Le Corbusier and Ozenfant coincided with the publication of *Après le Cubisme*, it was only during the next two years that their artistic conventions were determined and their conceptual premises ratified – partly in keeping with their prejudiced philosophical convictions, but also in response to certain pictorial discrepancies that were encountered. By way of example, research conducted by Baker (1996: 247) indicates that it was only in April 1919 that the architect first adopted the use of so-called *tracés régulateurs* – regarded by Le Corbusier (1923; 1987: 75) "an insurance against capriciousness" – to regulate the pictorial structure of his compositions. As far as could be established, the term *objet-type* first appeared in print in October 1920. It was thus only from that time onwards that the Purists' artistic and conceptual criteria were fully developed and pre-empted further investigation.

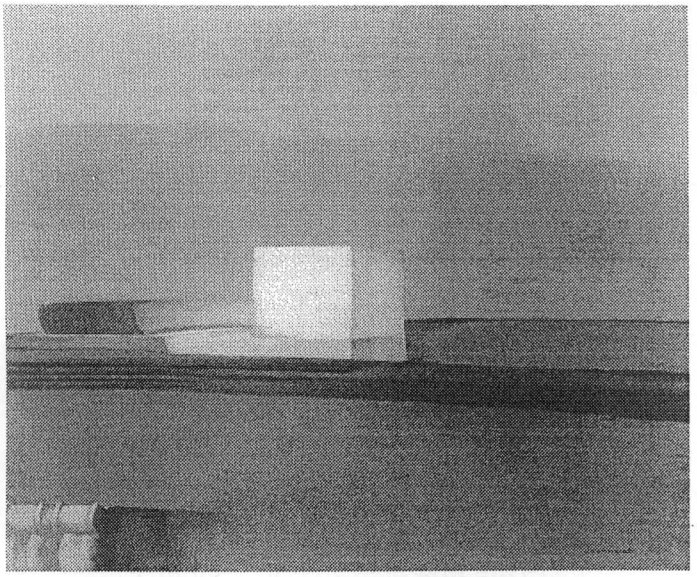
2. Despite their criticism that the indiscriminate distortions of Synthetic Cubism distracted from the intellectual significance of the subject matter, the Purists were never adverse to the novel pictorial techniques of simultaneity and abstraction. Since Cubism had already undergone its different stages of transformation at the time of the genesis of Purism, Ozenfant and Le Corbusier could be more selective in the manner in which they wished to adopt, or apply, the cubist *modus operandi.*

3. Green (1987: 90) points out that purist doctrine, as first communicated *L'Esprit Nouveau* in 1920, remained unaltered over the next five years. The Purists, however, never addressed the evolutionary changes that occurred in their paintings during that time, which often contradicted some of their initial statements. As Green (*ibid.*) puts it: "Between 1920 and 1925 the Purists' theory of painting stayed still as if frozen. It is a sign of the theory's lesser status in practice that during those five years Purist painting actually changed; enough, on the one hand to reveal unsuspected room for flexibility in their theory of form, and on the other effectively to undermine the authority of their statements about colour. "

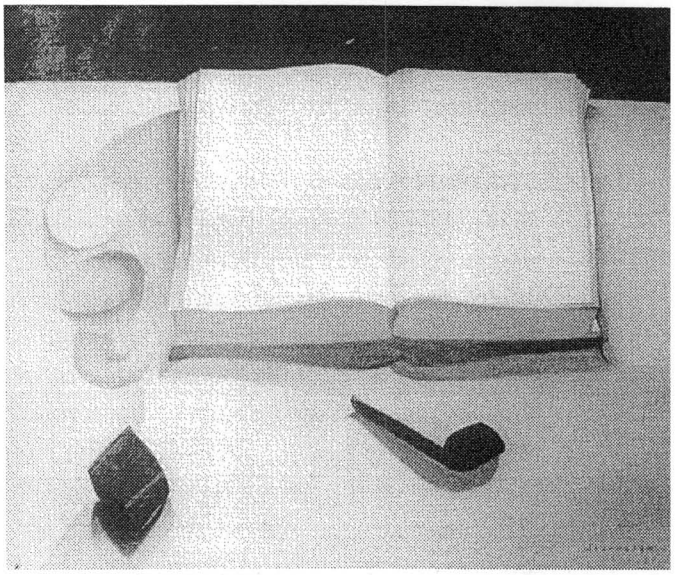
4. Green (*ibid.*: 91) is moreover of the opinion that the methodological approach adopted by the Purists was essentially analytical, even though its last, and most complex, phase can in some respects qualify as synthetic due to the re-assembly of the analyzed subject matter. In Green's own words (*ibid.*): "Broadly speaking, there can be no doubt that Purist painting was analytical, not synthetic, and even in 1925 the explanatory presentation of 'type-objects' was central ... by 1922 they were constructing their pictures with a freedom and formal bias closely attuned to Synthetic Cubism." Despite Green's contention regarding the "explanatory presentation" of the *objets-types*, there is little doubt that during the last stages of, particularly, Le Corbusier's work, there was a considerable lapse of emphasis on the conceptual significance of the subject matter, and his compositions were dominated by a distinct graphic virtuosity.

5. Space precludes the individual recording of every purist painting by Le Corbusier. Consequently, general characteristics have to suffice. Moreover, given the fact that a complete inventory of Le Corbusier's purist paintings does not exist, the following conclusions are restricted to available data.

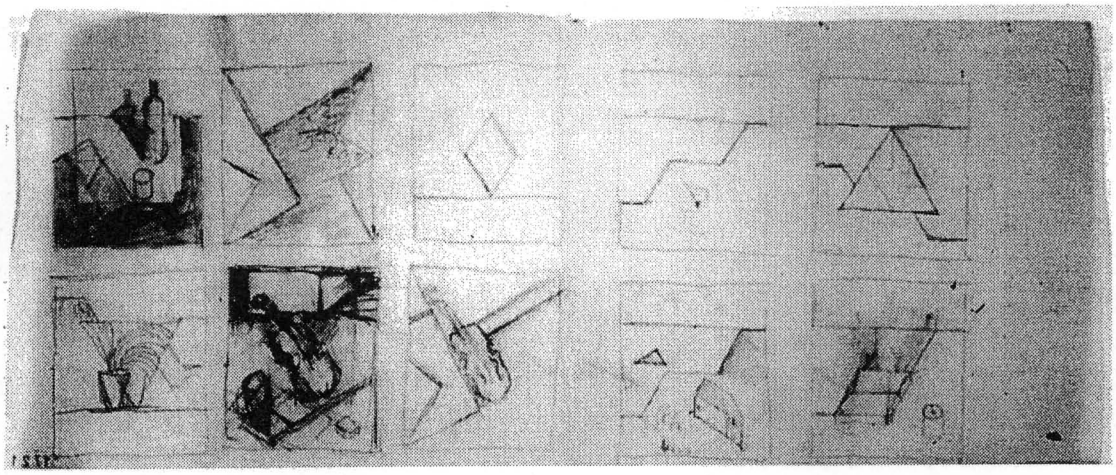
6. The particular divisions and accompanying titles were coined for the purposes of review and do not enjoy general currency.



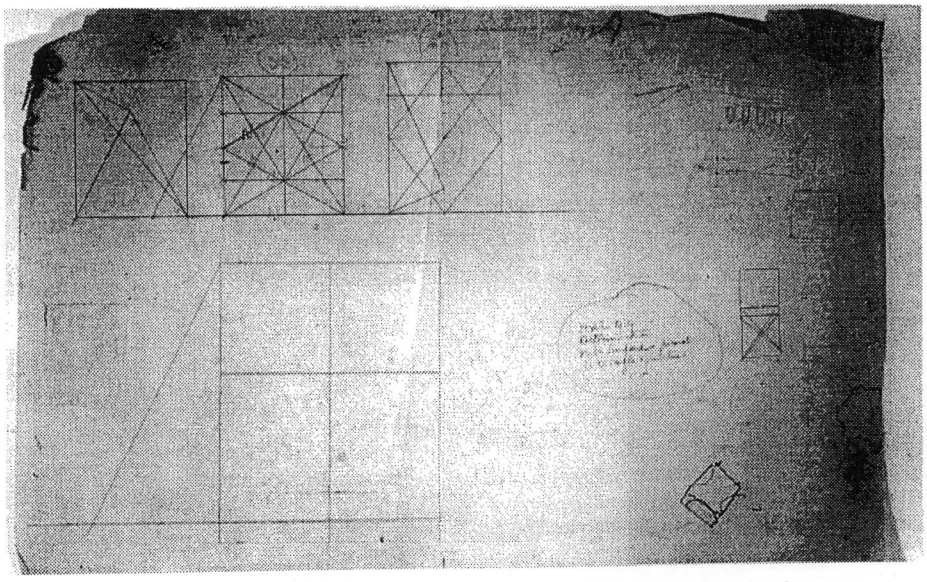
7.1 Rudimentary Purism: *La Cheminée [Acropolis]* (1918).



7.2 Rudimentary Purism: *Nature Morte avec Libre, Verre et Pipe* (1918).



7.3 Geometric investigations (1919).



7.4 First studies of *tracés régulateurs* (April 1919).

7.6.2 Rudimentary Purism (1918-1919)

This exploratory stage of Le Corbusier's paintings is the most varied and therefore difficult to ascribe general characteristics to it. Notwithstanding, the formal appearance of the subject matter remained consistently intact and the actuality of the depicted objects, although increasingly stylized, dominate in all instances. Also conspicuous is the careful selection of the subject matter – cubes, eggs, set-squares, sheets of paper, and so forth – which later either qualified as *objet-types*, or reinforced an idealized formalism due to their inherent geometric propensity.

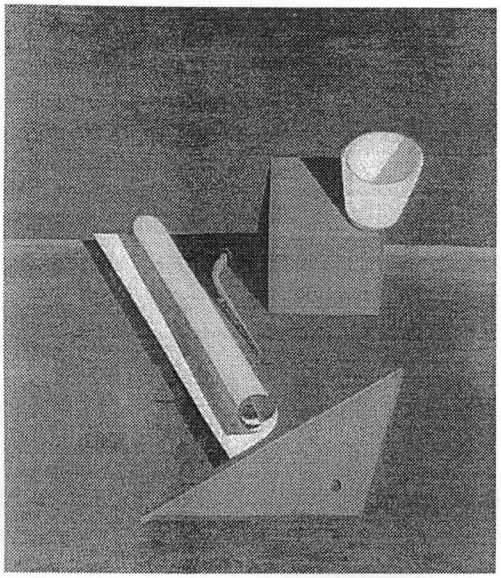
La Cheminée (*Acropolis*, 1918, *fig. 7.1*) and *Nature Morte avec Libre, Verre, et Pipe* (1918, *fig. 7.2*) were Le Corbusier's first ever oil paintings, also to be exhibited at Galerie Thomas, but are very different from each other. Although *La Cheminée* is documented to have been painted first (Baker, 1996: 246), it appears at odds within this sequence. *La Cheminée* is extremely minimal in content, but its compositional arrangement and obscure vantage point already alludes to a reverence that transcends the banality of the subject matter. Baker (*ibid.*) maintains that *La Cheminée* "highlights Jeanneret's main problem at this stage, this being to deploy the *objets-types* on the pictorial surface in ways that would propound the Purist message with conviction".

Following the hostile reception these paintings received by art critic Vauxcelles (*ibid.*: 247), Le Corbusier investigated the application of numerlogic conventions to regulate the structure of his compositions. Surviving sketches, presently housed at the Fondation Le Corbusier in Paris (*figs 7.3-7.4*), indicate that it was only once Le Corbusier employed the same ordering device that he had already introduced into his architecture with the design of Villa Jeanneret, La Chaux-de-Fonds, in 1912, that he was able to establish a satisfactory relationship between the objects and the over-all picture plane. A geometric discipline had been spawned. On the authority of Joyce Lowman (1976: 91), Le Corbusier made the following unsourced statement:

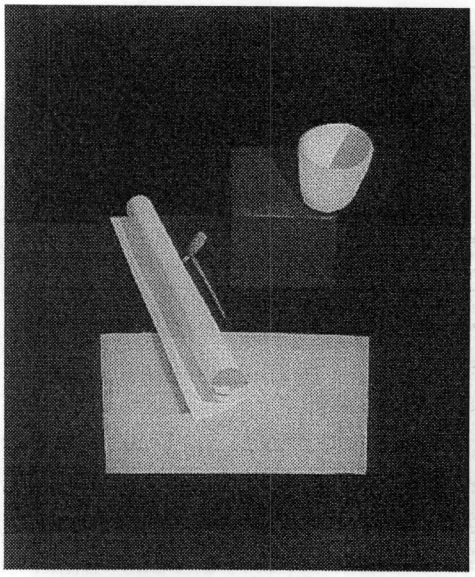
> "My first picture was done without 'guiding lines'. The second one also. But beginning with the third, I no longer felt that I had any right to avoid the obligation of organizing the elements of the poem which I had gathered together, whether it was a facade or a ground plan or a cross-section or a picture."

The next two paintings, *Le Bol Blanc* (*fig. 7.5*) and *Le Bol Rouge* (*fig 7.6*), date from 1919 and demonstrate the application of *tracés régulateurs*, presumably corresponding to the ratio of the favoured Golden Section. Not only the position, but also the angle of the scrolls illustrated in both paintings had been determined by underlying construction lines. Le Corbusier also introduced a bowl rather uneasily poised on the edge of a cube. This dramatic exordium must have been deliberate, teasing the viewer and drawing attention to a visibly controlled compositional dynamicism. Although shadow and shade had thus far been employed to convey the volumetric propensity of the subject matter, the gradual stylization of the objects indicates that representation is surpassed by more profound concerns and symbolic intentions.

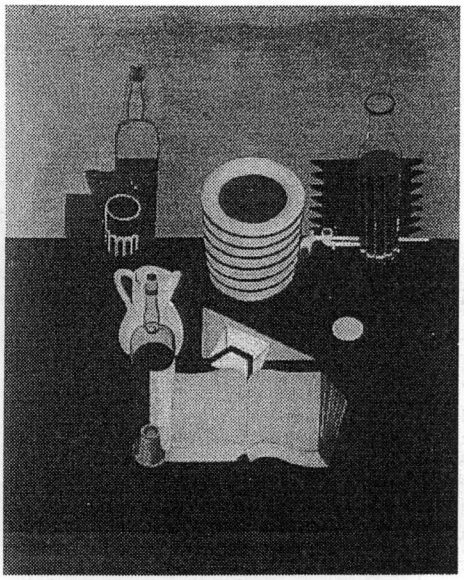
According to Baker (1996: 251), *Nature Morte à l'Oeuf* (1919, *fig. 7.7*) was the Le Corbusier's next painting, and, as far as it can be established, the final example of this rudimentary phase of Purism. This painting is particularly significant, judging from its numerous preliminary sketches (*figs 7.8-7.9*). One such drawing, catalogued as *Etude Puriste Objets: Bouteille, Carafe, Livre, Pipe* (*fig. 7.10*), is especially informative in that it illustrates the assortment of objects that the Purists had by that time identified as suitable material with which to conduct their artistic investigations. It is impossible to establish whether it was entitled *puriste objets* at that time or in retrospect. Notwithstanding, the identified artefacts qualify as *objets-types*, demonstrating the Purists' subsequent theoretical conjectures.



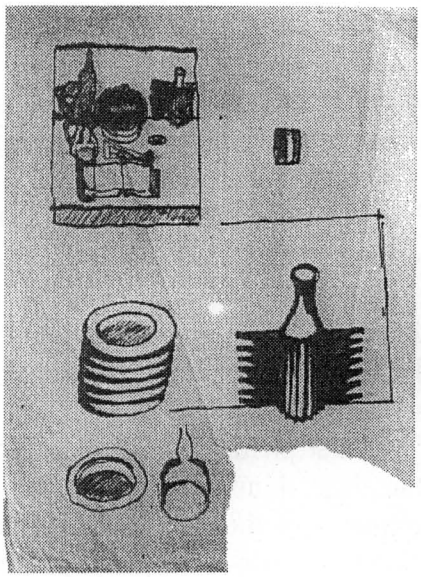
7.5 Rudimentary Purism:
Le Bol Blanc (1919).



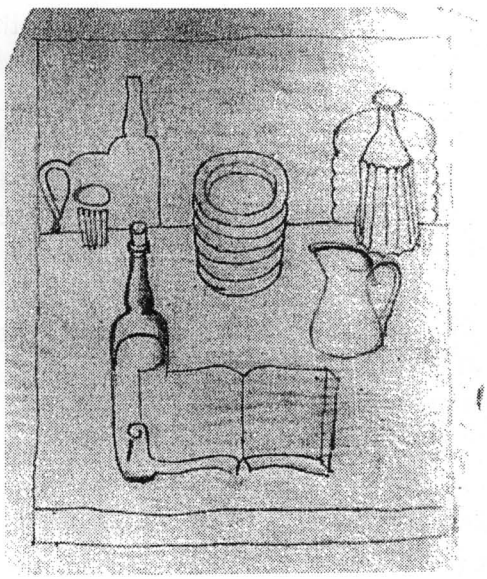
7.6 Rudimentary Purism:
Le Bol Rouge (1919).



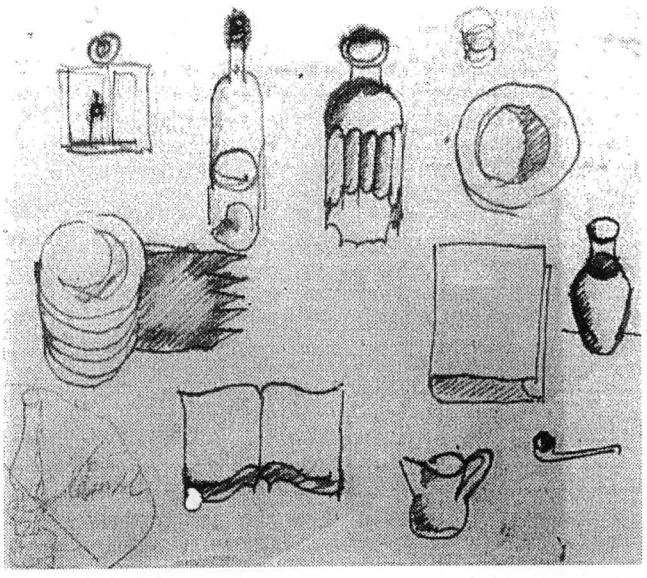
7.7 Rudimentary Purism:
Nature Morte à l'Oeuf (1919).



7.8 Studies for
Nature Morte à l'Oeuf (1919).



7.9 Studies for
Nature Morte à l'Oeuf (1919).



7.10 *Etude Puriste, Objets:*
Bouteille, Carafe, Livre, Pipe (1919).

Oddly enough, none of these preliminary studies indicate any regulating lines. Yet, the distinctly symmetrical composition, the calculated distribution of counter-balanced subject matter, and mathematicly determined divisions of the foreground and background vacuously display an underlying system of control. (Baker [1996: 252] is of the opinion that Le Corbusier used transparent overlays to determine the pictorial order of his compositions and that these have in all likelihood been destroyed.) The merging of certain objects in *Nature Morte à l'Oeuf* is also far more dramatic than that in the previous two still-lifes, creating novel pictorial relationships. With this particular painting, Le Corbusier had discarded most tonal differentiation and was exploring instead projected shadows and silhouettes. These 'shadow profiles' violated all representational drawing conventions in that (irrespective of the number of light sources) shadows were cast simultaneously in different directions, and even projected a considerable distance away from the object. This peculiar technique also amplified the formal structure of the *objet-type* that would henceforth be utilized to great effect.

It is not a particularly meritorious painting since certain pictorial relationships remained unresolved, displaying also a perturbing sense of scale. The sizes of the *objets-types* appear much too small in relation to the format of the canvas. Yet, the painting's overriding value lies in its transitionary capacity, and in the numerous creative possibilities and latent ambiguities that were to be explored in the ensuing years.

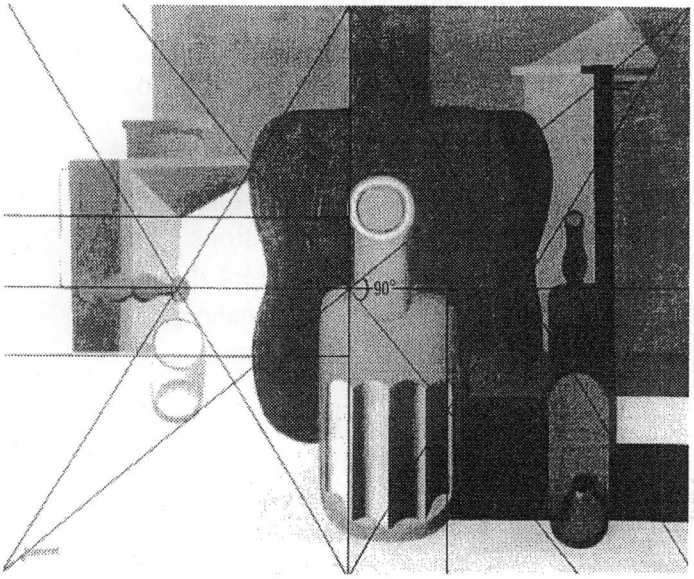
Although all these compositions were divided consistently into a foreground and a background, there is no hierarchial distinction between the sizes of the objects and the relative positions that they occupy – whether in relation to one another, or to the whole. Notwithstanding, the compositions continue to convey a distinct sense of pictorial depth. Reichlin (1997: 196, 197) is of the opinion that these embryonic paintings indicate that Le Corbusier was, from the outset and in keeping with the aspectival developments in the visual arts, preoccupied with a premeditated spatial ambiguity:

> "Here the formal shapes, dimensions, and scaling of the [subject matter] are as clear and intelligible as anything in a Flemish still life. What is problematic is the arrangement of these objects in space, which does not conform to naturalistic canons of perspective."
> "To an illusionistic, 'naturalistic' transcription of objects purist painting opposes a compositional strategy that no longer refers to objects but only to their forms, to 'pictorial remains' subjected to a formalization that heeds only to the compositional and spatial requirement of the painting."

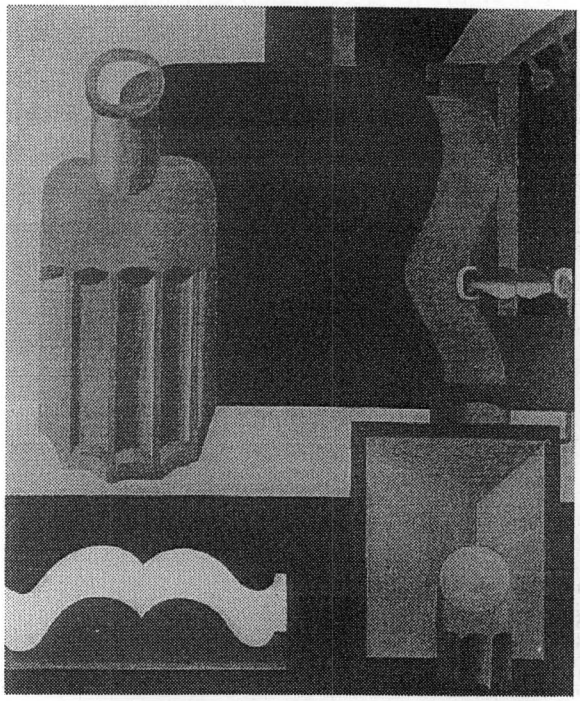
7.6.3 Volumetric Purism (1920 -1921)

Le Corbusier's paintings dating from this supposedly mature stage of Purism, are characterized by an amalgamation of the *objets-types*; the adoption of the cubist technique of simultaneity; and a distinctly volumetric (sculptural, even tectonic) quality. Due to the reliance on algebraic organizational principles, the compositions exhibit the visual equilibrium to which the Purists were so ardently committed (*fig. 7.11*). Although the fusion of the *objets-types* eroded the delineation of the respective forms, the autonomy of the artefacts is still clearly recognizable. In addition, the introduction of multiple views emphasized the conceptual significance of the object, being far more informative about its appearance than during the preceding phase.

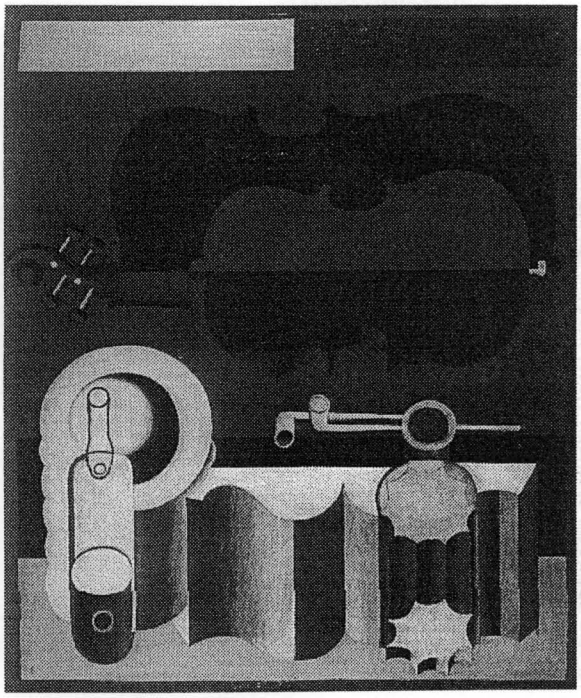
Whereas the artefacts previously dominated as isolated objects in space and merged only tentatively, they were now compressed: placed in front, behind and on top of one another. Due to a sudden increase of scale, the distribution of the subject matter was no longer restricted by the confines of the picture plane. Parts of the *objets-types* which would have projected beyond the canvas were disassembled and incorporated elsewhere. Furthermore, the superimposed *objets-types* exist as orthographic projections that were extrapolated simultaneously in more than one direction (*fig. 7.12*). Even though orthography (whether axonometric or isometric) is a drawing convention conducive to the simultaneous portrayal of different points of view, Le Corbusier incorporated additional vantage



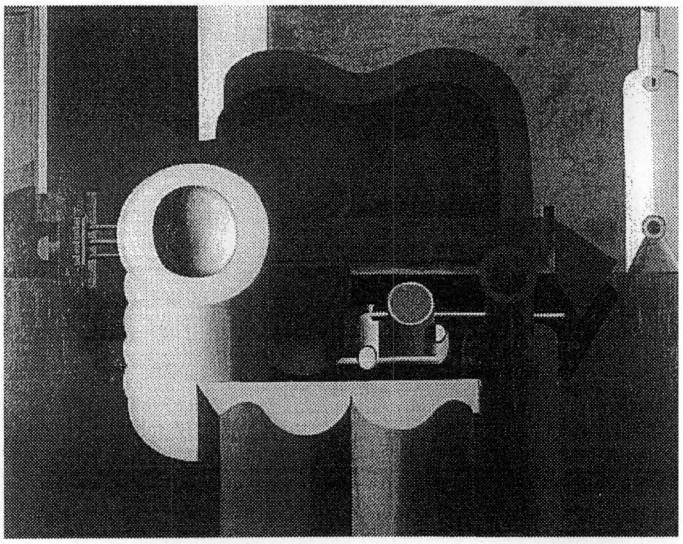
7.11 Volumetric Purism: *Composition à la Guitare et à la Lanterne* (1920).



7.12 Volumetric Purism: *Guitare Verticale*, no. 1 (1920).



7.13 Volumetric Purism: *Nature Morte au Voilin Rouge* (1920).



7.14 Volumetric Purism: *Nature Morte à la Pile d'Assiettes* (1920).

points to emphasize the underlying geometric structure of the artefact and its mode of assembly. Reichlin (1997-198) comments:

> " ... the viewer is confronted by a curiously frontal axonometric projection in which objects seem to float, compressed and driven out toward the viewer. But this is only a way station on the road to a type of representation where what at first appears to be a form of axonometry proves instead to be an illusion that adroitly betrays our habits of perception. Indeed, it is the product of a manipulation that mixes two sorts of projection – one vertical, the other frontal – and forces the viewer to become cross-eyed in order to decipher the overall effect ..."

Due to the inherent three-dimensional quality of orthographic projections, the artefacts display a far greater degree of solidity than during the previous stage when they were realistically depicted (*fig. 7.13*). According to the interview conducted with Bosson (1995a: 14) in 1962, Le Corbusier ascribed the increase in volumetric velocity to his loss of stereoscopic vision:

> "I'm unable to perceive the third dimension with my eyes. Perhaps that is the reason why I've sought to get behind things, to get into their volume from all sides, and into their structure and core ... The loss of my stereoscopic vision made me want to create paintings which could be translated into sculptures."

The voluminousness of the objects was further reinforced by tonal variation and shading. Shadows were used to echo the shape of the objects, and also to accentuate the contrast between the three-dimensional – volume – and the two-dimensional – shape (*fig. 7.14*). Whereas colour had previously been employed to differentiate between the object and the background, it was now used as the principal medium to distinguish one artefact from another.

Despite the lack of perspective, and the avoidance of any hierarchial distinction between the artefacts and the relative positions they occupy, the compositions are extremely spatial – inevitably due to the nature of orthographic projections. The manner in which the objects were superimposed also created a distinctly layered sense of space – reading as objects of space, set in space.

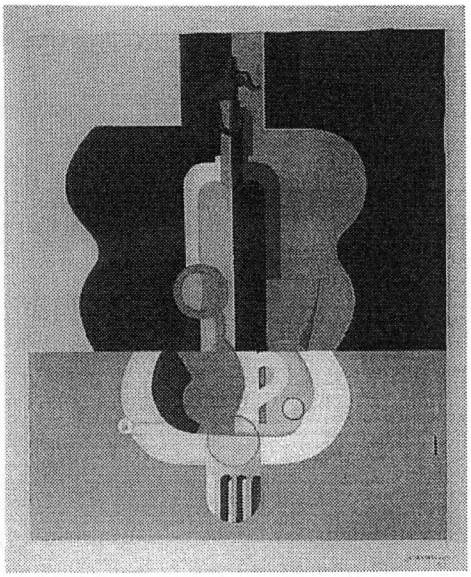
The introduction of architectural drawing conventions to still-life painting is significant in that it supplied fine arts with an additional method to create pictorial depth – a contribution unique to the Purists.[29] The Purists actually stated in "Le Purisme" (1921) that perspective only offered "a particular and hence an incomplete angle ... [appealing] nearly exclusively to sensations of a secondary order and is consequently deprived of what could be universal and durable" (Naegele, 1995: 94). Reichlin (1997: 199) adds:

> "Purist paintings certainly suggest depth, volume, and space. But they also deprive the eye that [visual] reassurance ... [that] was the driving force behind the invention of perspective."

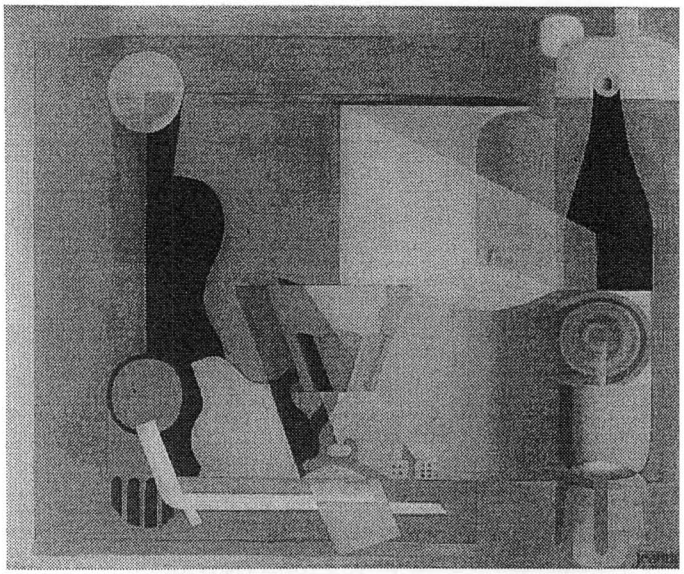
The fusion of the different *objets-types* not only created intricate formal and spatial relationships, but also enabled endless variety achieved with a relatively limited artistic arsenal. Moreover, these investigations heightened an awareness of the pictorial ambiguities inherent in volume versus plane, solid versus void, opacity versus transparency, and positive versus negative – plastic characteristics which precipitated the most exuberant phase of Purism.

---

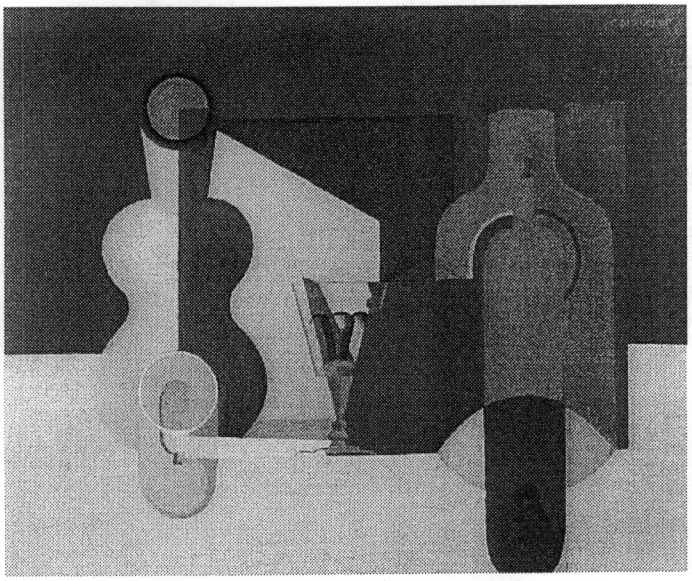
29 To date, the only other painterly examples of orthographic projections that have been encountered include those by the Suprematists, Klutsis and Lissitzky, and Van Doesburg. However, their renderings were distinctly architectural in content. By contrast, Le Corbusier's adaptations, although of architectural origin, were totally unrelated to architecture.



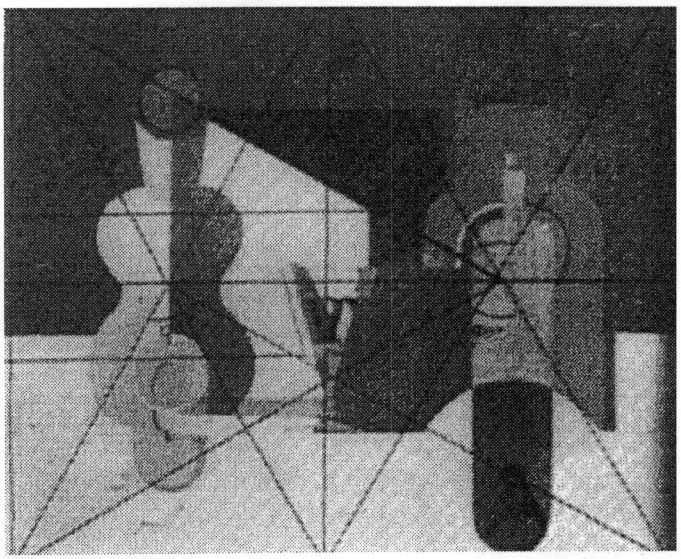
7.15 Fragmented Purism:
Nature Morte au Siphon (1921).



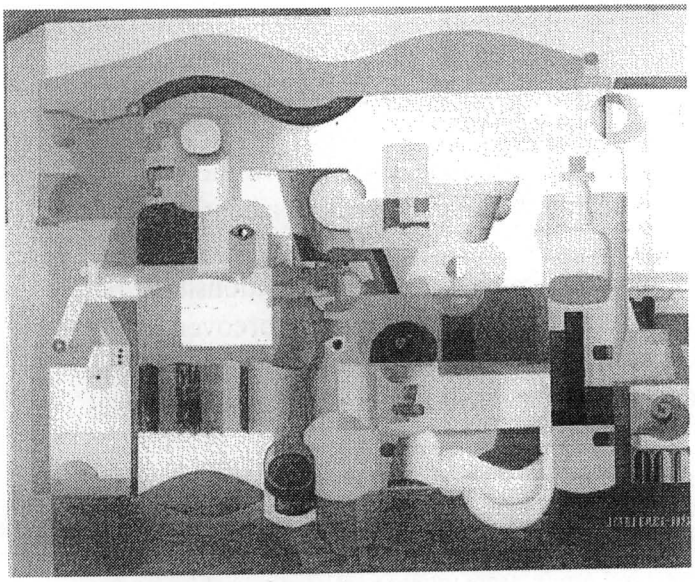
7.16 Fragmented Purism:
Nature Morte Pâle à la Lanterne (1922).



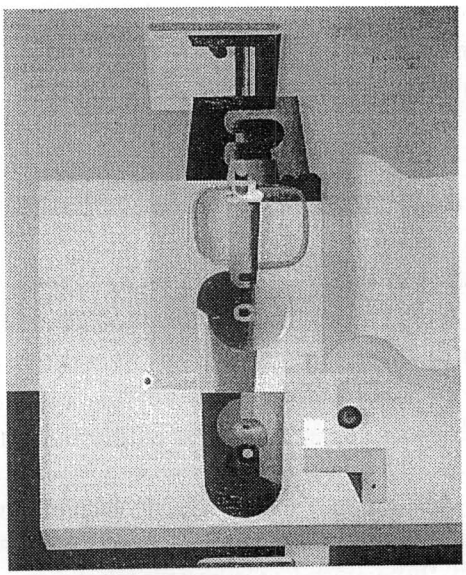
7.17 Fragmented Purism:
La Bouteille de Vin Orange (1922).



7.18 *La Bouteille de Vin Orange* with regulating lines.



7.19 Fragmented Purism:
Nature Morte aux Nombreaux Objets (1923).



7.20 Fragmented Purism:
Bouteille et Livre (1926).

7.6.4 Fragmented Purism (c. 1922-1925/7)

From approximately 1922 onwards, the distinctly voluminousness of the preceding compositions was increasingly surpassed by an interest in the planimetric aspects of the subject matter. However, the disconcerting spatial readings achieved during the previous phase continued to fascinate the artist, and were even further exploited through the contrasting effects of volume versus shape, and positive versus negative shadow profiles (*figs 7.15-7.18*). Having discarded the orthographic, Le Corbusier now generously employed the cubist technique of disassembly and reconstruction, and in the process discovered a novel range of geometric configurations that he explored to great effect.

By 1923, the objects in Le Corbusier's paintings started to multiply. [30] The *objets-types* were also combined with fragments of their vivisected views, resulting from previous explorations, and were reassembled into complex graphic montages. Although the different vantage points of the subject matter were often divorced from their sources of origin, the generating *objets-types* were still identifiable, but, significantly (and anonymously), referred to as *Nature Morte aux Nombreaux Objets* (Still-Lifes with Numerous Objects, *fig. 7.19*).

The graphic quality of the artefacts seems to dominate, yet, Le Corbusier continued to create ambiguous spatial illusions. As Reichlin (1997: 200) poignantly remarks:

> "Here composition focused on a dominant center yields to a spatial texture animated by multiple centres of attention. ... No matter where the viewer looks, he is confronted by different and contradictory spatial constructs, as in the 'impossible spaces" created by M. C. Escher."

The manner in which certain fragments of the objets-types were rendered still alluded to their own voluminousness, and the paintings hover between two-dimensional graphic assemblages and an overt sense of depth. This is particularly apparent in *Bouteille et Livre* (1926, *fig. 7.20*).

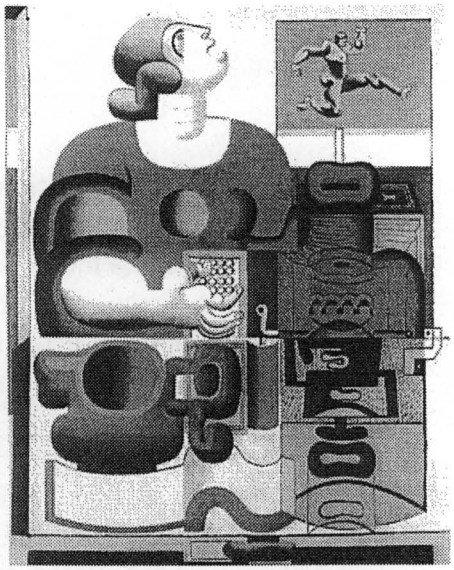
This was undoubtably the most abstract phase of Purism. The past interest in the conceptual significance of the subject matter seems to have lapsed, and the plastic potential of both subject matter and composition has become the primary consideration. Green (1987: 91) concurs:

> "Their type-objects became as if elements of an abstract pictorial vocabulary to be manipulated as the need for rhyming relationships demanded. The symbolic connotational meanings carried by these objects were not lost, but they were, for the Purists, secondary, and therefore never diverted them from the essential 'purity' of their compositional inventions."

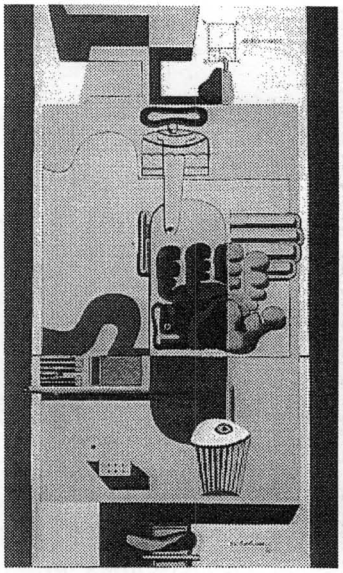
It is during this particular stage that the difference between Le Corbusier's and Ozenfant's paintings is most noticeable. Ozenfant followed the same pictorial procedure, but he remained committed to a far greater extent to the formal integrity of the *objets-types*. By contrast, Le Corbusier's work is more diversified, spatially complex and colourful. His graphic montages emanate a creative exuberance that were undoubtably explored towards their own artistic ends. The vast range of evocative and sensual shapes, coupled with a honed spatial sensibility, were to find recondite expression in his architecture.

---

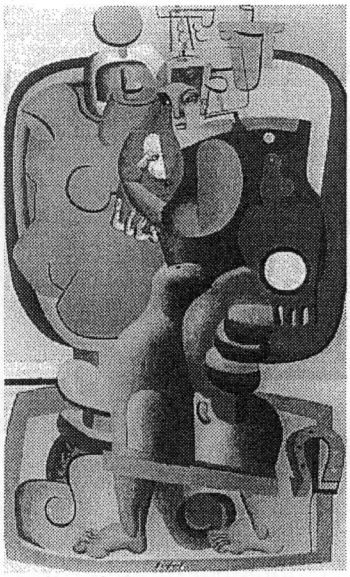
30 Golding (1994: 146) claims that Le Corbusier's sudden compositional enrichment was influenced by photographs of so-called *verrerie du commerce* (wares of commerce) – mass-produced items such as crockery and glass-ware. See examples in Le Corbusier, 1925; 1987, *The Decorative Art of Today*: 94, 97.



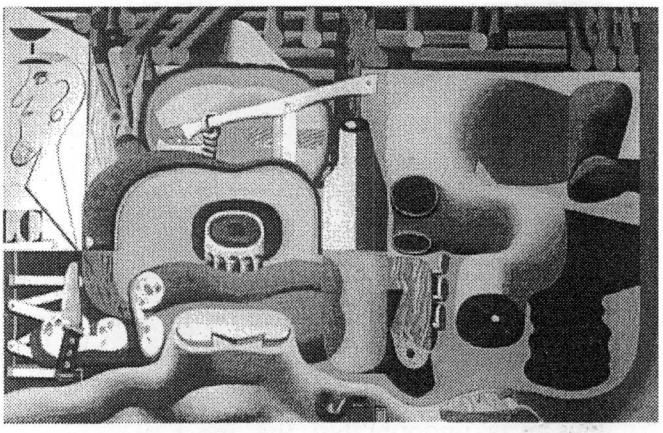
7.21 Post-Purist: *La Joueuse d'Accordéon [La Femme à l'Accordéon et le Coureur]* (1928).



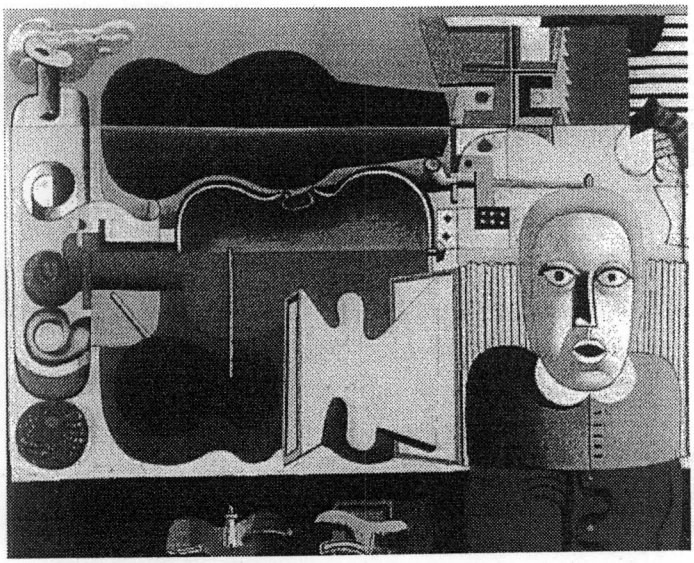
7.22 Post-Purist: *Composition avec une Poire* (1929).



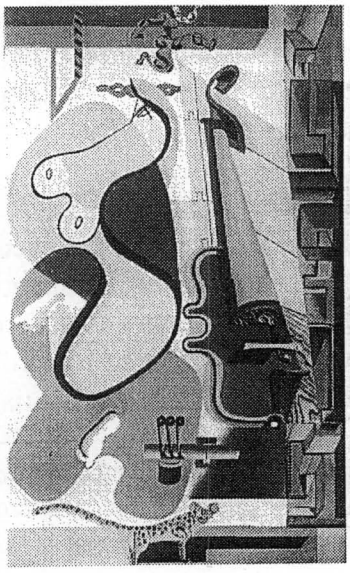
7.23 Post-Purist: *La Femme au Guéridon et au Fer à Cheval* (1928).



7.24 Post-Purist: *Nature Morte – Le Bûcheron* (1931).



7.25 Post-Purist: *La Fille au Gardien de Phare* (1929).



7.26 Post-Purist: *La Danseuse et le Petit Felin* (1932).

Daniel Naegele (1995: 93) observes:

> "[Le Corbusier's] Purist painting all conspires to create consciously contradictory readings at once both planar and spatially deep. The Purist canvas is replete with illusions. These illusions are, no doubt, in part the result of the rigid geometric regulation of the canvas and the contents specified in Purist theory."

7.6.5 Post-Purist Period (1928 and Beyond)

Following the breach with Ozenfant in 1925, Le Corbusier continued to paint. The paintings that he produced between 1926 and 1927 are a visible extension of preceding explorations, but changed radically soon after. Bosson (1995b: 20) purports that Ozenfant had actually inhibited Le Corbusier's creativity and that the separation was advantageous:

> "After the break with Ozenfant Le Corbusier's rich imagination and creativity broke every -ism and also with all the programmatic and theoretically defined boundaries of the art form which was classified under the slogan of 'functionalism'. He lifts himself beyond this area to a freer creation of form which is most adequately ... comparable to the lyric creations of a Picasso or a Léger ..."

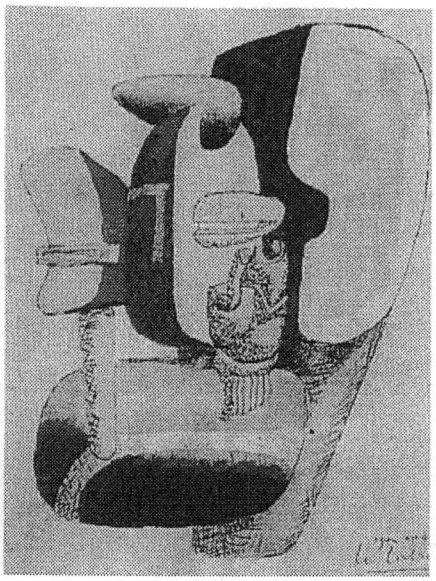
Although difficult to date exactly when the human figure made its first appearance in Le Corbusier's paintings, it is clear that by 1928 the subject matter of Purism had lost its appeal (*figs 7.21-7.22*). In his interview with Bosson (1995a: 15) in 1962, Le Corbusier mentioned that he had tired of bottles as subject matter. In addition to the human figure and parts of the anatomy – the ear, bones and intestines – other natural phenomena, such as, shells, pine cones, pieces of rope and timber, were also depicted (*figs 7.23-7.24*). His sudden departure from *objets-types* to *objects à réaction poétique* is generally ascribed to his relationship with his future wife Yvonne Gallis, whom he married in 1930. The softer, curvilinear shapes that emerged during the last phase of purist painting, coincide with the sensual curves of the human body and make the transition appear less abrupt than generally claimed.

Le Corbusier's paintings from this point onwards became increasingly figurative, vacillating between a vast range of eclectic influences that make it difficult to categorize. Léger's work, especially his tubular treatment of the human figure, served as a prominent influence. In addition, Le Corbusier's paintings started to acquire a bizarre, even surreal, quality calling for a highly subjective interpretation (*figs 7.25-7.26*). [31] However, his commitment to the structured organization of the composition never lapsed and remained a consistent feature throughout his entire career as a painter. (Refer to *Composition avec une Poire*, 1929, *fig. 7.22*, which includes the diagrammatic rendition of the Golden Section.)

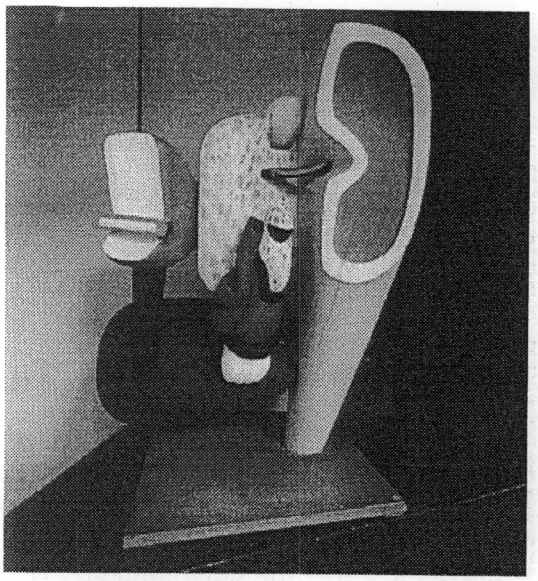
It is beyond the scope of this thesis to investigate how the changes in his art pre-empted his post-purist architectural development. Yet, it is worthy to note that, concurring with the introduction of the human figure, his paintings acquired a tactile and material sensibility that had been previously been lacking. This pictorial phenomenon precipitated the regionalist quality discernible in his architecture, commenced with in the design of Pavillon Suisse, Paris, of 1930. It was only after the Second World War in 1946, that Le Corbusier, together with carpenter Joseph Savina, started to translate his paintings into sculptures (*figs 7.27-7.28*). The ease with which these volumetric transformations occurred, anticipated the sculptural and biomorphic nature of the most poetic building of his *œuvre complète*, La Chapelle Notre-Dame-du-Haut, Ronchamp (1953, *figs 7.29-7.30*).

---

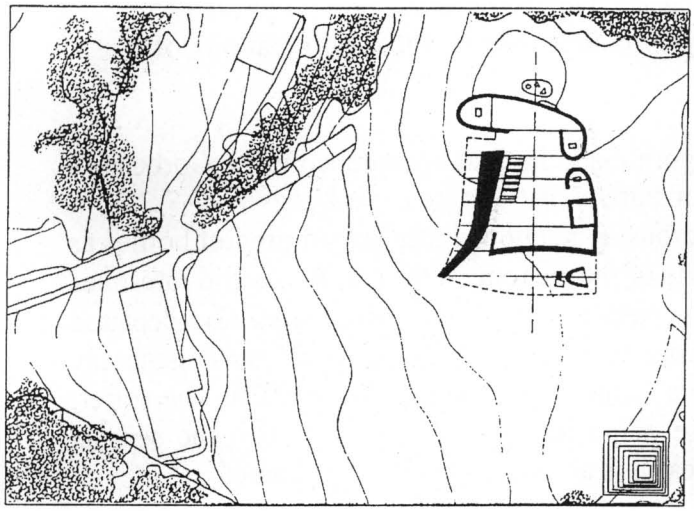
31 See Krustrup, M., 1995, "Persona", in Bosson, Von Moos, Naegele, *et al.*, *Le Corbusier, Painter and Architect:* 118-158, for an eloquent review of the symbolism prevailing in Le Corbusier's post-purist paintings, which drew extensively upon Greek mythology, astrology and Judaeo-Christian religion. See also Coll, 1996, "Structure and Play in Le Corbusier's Art Work": 3-15.



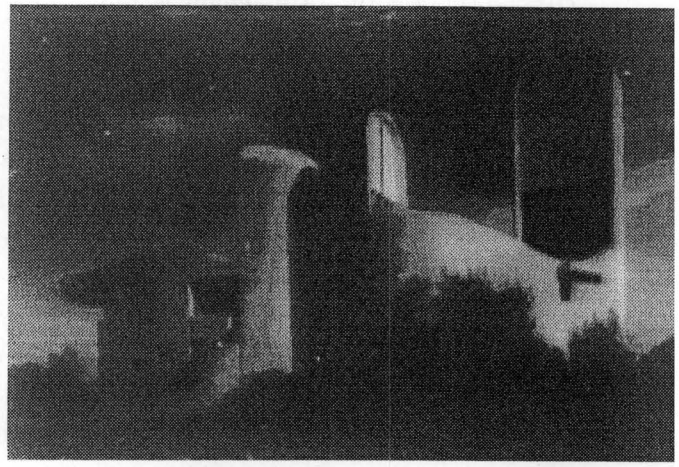
7.27 Post-Purist: *Ubo* (1940).



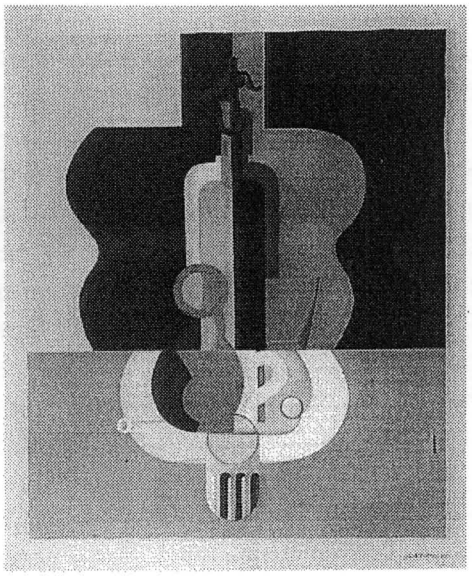
7.28 Post-Purist: *Ozon Opus 1* (1947).



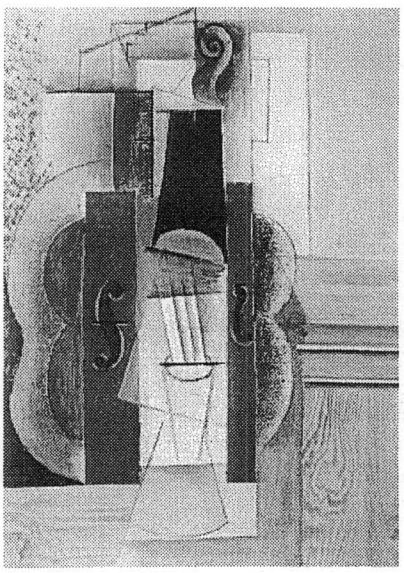
7.29 Plan, La Chapelle de Notre-Dame-du-Haut, Ronchamp (1955).



7.30 La Chapelle Notre-Dame-du-Haut, Ronchamp (1955).



7.31 Jeanneret, *Nature Morte au Siphon* (1921).



7.32 Picasso, *Violin Hanging on a Wall* (1913).

7.7 PURISM, IN CONCLUSION

In stark contrast with the dogmatism of the theoretical content of Purism, purist paintings convey a surprising cautiousness and puritanical restraint. Green (1991: 80) remarks:

> "... the elemental abstractions of De Stijl make the bottles and jugs of purist seem timid: Mondrian is dramatically quiet, the Purists are simply quiet."

Despite an extensively developed formal language and an elaborate aesthetic philosophy, the *peintures puristes* are often described as disappointing since it led to no more than calculated distillations of *objets-types*. When comparing cubist paintings of similar subject matter with those by the Purists (*figs 7.31-7.32*), it is not difficult to assess why Purism is not as esteemed as its precedent. The intuitively organized compositions of Picasso and Braque display a far greater degree of artistic virtuosity and creative exuberance than any of Le Corbusier or Ozenfant – a view shared by Fry (1966: 171):

> "Unfortunately, the purist paintings of Ozenfant and Jeanneret are cubism stripped of all its spatial and formal tension, wit, and ambiguity: a sort of heretical, Calvinist cubism."

In the final analysis, the profound conceptual claims attributed to the depicted subject matter are visually obscure and totally irrelevant to the uninformed viewer.

It is also submitted that the space-time concept is more prevalent in the seminal cubist paintings than in any of the purist still-lifes. This statement is substantiated by the fact that Picasso and Braque were more selective in the views which they portrayed simultaneously, whereas the Purists depicted <u>all</u> the different views of an object at the same time. Due to this selectiveness, cubist paintings induce a greater degree of mystique and are, consequently, both more dynamic and participative, actively involving an imaginary reconstruction of the subject matter through time and in space. By contrast, purist paintings are <u>informative</u>. They <u>describe</u> the object: what it is and how it was constructed. Yet, the artefacts do not remotely have the same material sensibilty as exhibited in cubist paintings – an aspect one would have expected Le Corbusier, as an architect, to have considered and furthered. Instead, the Purists deliberately avoided all tactile sensation since it conflicted with their desire to create a generalized anonymity associated with an industrialized form of art. Amancio Guedes (1988: 23) makes the following observation:

> "They assembled their paintings not only out of standardized objects but out of standardized pictorial parts, as if in creative mimicry of mass production ... So careful are such paintings planned that their flat surfaces of colour rise in low plateaux of paint ... the result of a laborious and long process ... The process of painting had become the process of manufacturing an idea defined almost to the last detail."

Notwithstanding, the Purists introduced a novel method of three-dimensional representation to still-life painting – a contribution unique to all the cubist derivatives. They also succeeded in restoring the formal integrity of the subject matter as they had set out to do. They gave a greater degree of clarity to Picasso's shifting viewpoints, but the artistic implications, although more informative, are, regrettably, far less dynamic. This was particularly due to the artists' unyielding commitment to achieve visual harmony, coupled with the ciphered exactitude with which their paintings were excecuted.

It was only through Le Corbusier's architecture that the formal language of Purism would finally come into its own, reach true abstraction and achieve fruition. In Le Corbusier's own words from *New Worlds of Space* (1948a: 37):

> "The key to my creativity is my work in the field of painting which I took up in 1918 and have continued to practise daily. The basis of my intellectual quest and production lies in the uninterrupted pursuit of painting. It is here that the source ... of my work is to be found."

7.8 SUMMARY

This chapter examined the cubist derivative, Purism, in order to establish a framework for reviewing the transformation of the architecture of Charles-Èdouard Jeanneret / Le Corbusier. By Le Corbusier's own admission, his artistic investigations conducted from 1918 were the seminal influence on his development as an architect. Attention was drawn to the disturbing fact that this aspect is either underestimated or entirely overlooked by academics reviewing his architectural accomplishments.

The inception of Purism is ascribed to the initiative of French artist and critic Amédée Ozenfant, who, since the mid 1910s, had been advocating a modern artistic expression that adhered to timeless and universal values. Ozenfant's interest in Platonic doctrine coincided with the philosophical premises that had intrigued Le Corbusier since his formative years at La Chaux-de-Fonds, Switzerland. Their shared sentiments culminated in the genesis of Purism – an artistic initiative which they believed would improve on the pictorial innovations of Cubism and finally succeed it.

Purism was officially launched with a publication of the booklet *Après le Cubisme* (After Cubism) in 1918 – an event that coincided with an exhibition of their first paintings that expounded purist aesthetic theory at Galerie Thomas in Paris. Although the Purists appreciated the reductive methodology of Cubism and employed its pictorial practice of simultaneity, their principal theoretical arguments focussed on its deficiencies. According to Ozenfant and Le Corbusier, these included the unwarranted distortion of form that undermined its conceptual content, the lack of sound compositional organization, and the failure to address *l'esprit nouveau* that was induced by the industrial *Zeitgeist*.

Purist aesthetic doctrine consisted of two components: the one *à propos* pictorial conventions, the other with regard to conceptual considerations. These premeditated criteria both motivated and substantiated their choice of subject matter – qualified as *objets-types* – and provided the pictorial framework for their depiction according to certain hierarchial distinctions and metaphysical canons – Euclidian geometry and proportion, in particular.

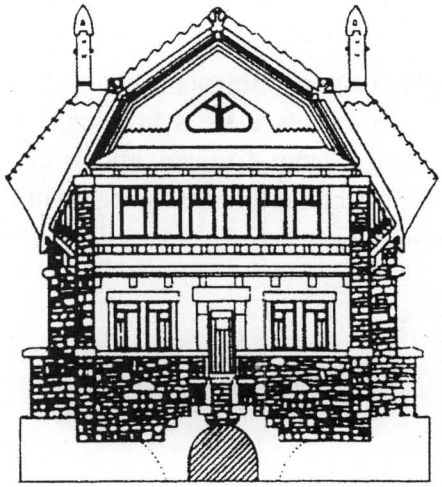
The Purists' perception of beauty was also intimately connected to the utilitarian significance which they ascribed to their subject matter. They maintained that an object was beautiful once the correlation between function and form had been perfected, when the inherent need to create order had been satisfied, and the purported aspiration to create harmony had been established. Accordingly, it was the duty of the artist, and subsequently the architect, to mimic the harmony and order prevailing in nature through latter-day techniques.

Purist painting can be divided into three stages. During the rudimentary stage, dating from 1918 to 1919, the formal appearance of the subject matter – so-called tools of the industrial culture – remained intact in order to convey their conceptual significance. The second stage, from 1920-1921, was characterized by the volumetric velocity of the *objets-types*, depicted as orthographic renderings that projected simultaneously in all directions. During the last stage, from approximately 1922 until after the dissolution of Purism in 1925, the *objets-types* had been fragmented and were reassembled as complex graphic compositions.

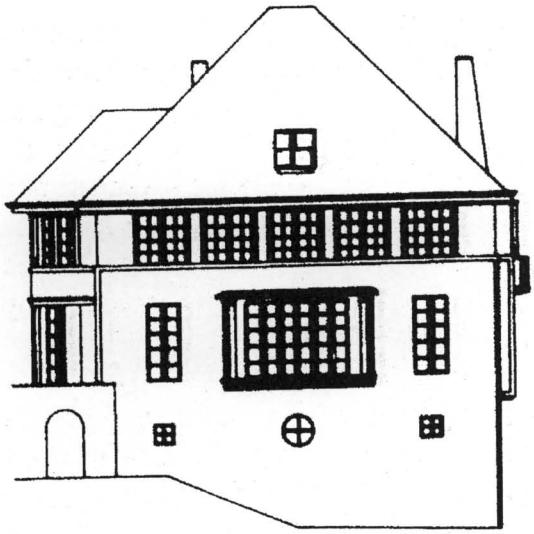
Although purist paintings are not highly esteemed by art critics, it was the manner in which artistic and utilitarian premises were synthesized into a plausible aesthetic dogma that Purism demonstrated its independence from Cubism and other contemporaneous art movements. It was only through Le Corbusier's architecture that purist painting would reach fruition.



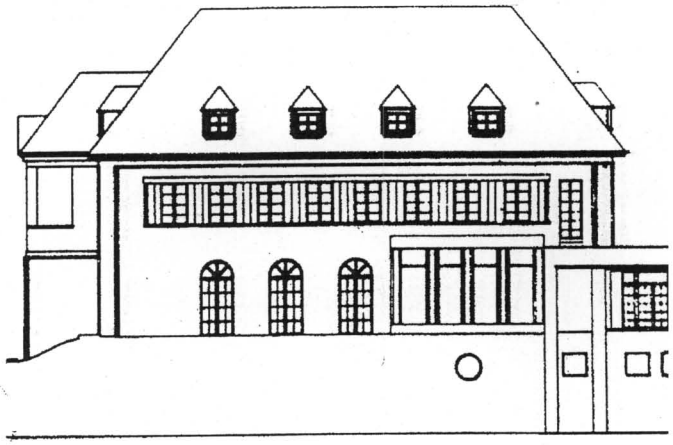
8.1 Villa Fallet, La Chaux-de-Fonds (1905).



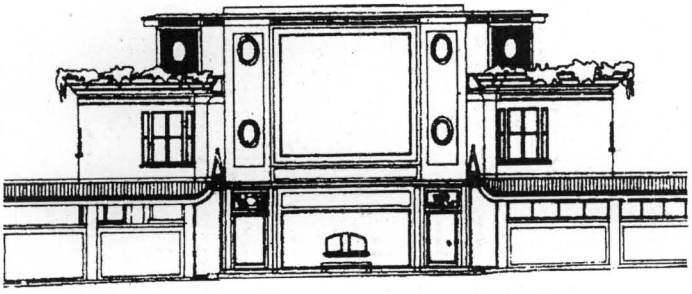
8.2 Villa Stotzer, La Chaux-de-Fonds (1908).



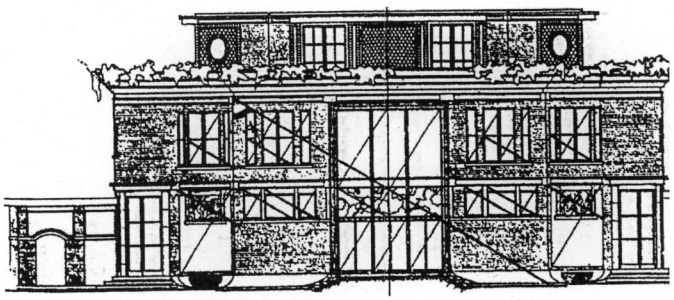
8.3 Villa Jeanneret-Perret, La Chaux-de-Fonds (1912).



8.4 Villa Favre, Le Locle (1912).



8.5 Villa Schwob, La Chaux-de-Fonds (1916).



8.6 Villa Schwob, La Chaux-de-Fonds (1916).

CHAPTER 8 THE CORRESPONDENCE BETWEEN PURIST ART & PURIST ARCHITECTURE

8.1 PREFACE

This chapter reviews the metamorphosis of Le Corbusier's purist architecture that had resulted from his artistic career. In order to so, reference is made to his architecture prior to the genesis of Purism in 1918. This inquiry is restricted to Le Corbusier's domestic repertoire since the artistic influence is most noticeable in that particular genre of building.

The introductory part of this chapter provides a synoptic review of the influences during Le Corbusier's formative years. This is followed by an in-depth analysis of the formal, conceptual, compositional and spatial correlations between his purist art and architecture.

8.2 INTRODUCTION (FORMATIVE YEARS, 1887-1916)

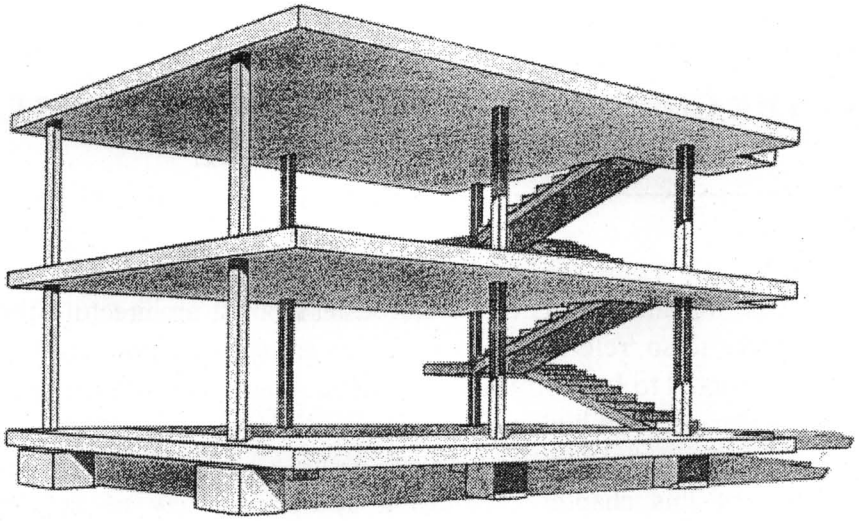
Le Corbusier had long before the inception of Purism in 1918 actively pursued a career as an architect. Following his decorative arts education and a rudimentary introduction to architecture at L'Ecole des Arts et Métiers, La Chaux-de-Fonds, [1] he designed his first building, Villa Fallet (*fig. 8.1*), at the age of eighteen in 1905 – though executed under the supervision of a local architect, Renè Chapallaz. Le Corbusier's travels from 1907 to 1911, contact with leading figures of the Modern Movement and apprenticeships served with Auguste Perret (1874-1954) between 1908 and 1909, and Peter Behrens (1868-1940) in 1910, contributed to the expansion of his architectural frame of reference way beyond the colloquial romanticism – steeped in the Art and Crafts and Art Nouveau traditions – advocated by his tutor, L'Eplattenier.

The tempered, though distinctly classical, idiom of the houses produced immediately after Le Corbusier's return from his *voyage d'orient*, in 1911, deviated considerably from the amalgamated Jugendstil and Swiss vernacular of his earliest projects (*figs 8.2-8.4*). Villa Schwob, La Chaux-de-Fonds (1916, *fig. 8.5-8.6*), the last commission dating from these formative years, serves as a summary of the contradictory influences that dominated his work during this period. In addition to historical references and the influence of the above-mentioned individuals, the theories of Loos, and the work of Viennese architect Josef Hoffman (1870-1956) [2] and Wright contributed to the project's realization. According to Von Moos (1968; 1975: 17), Villa Schwob "brought the chapter Charles-Edouard Jeanneret to a close" but he, nonetheless, "succeeded in translating the most contradictory influences of his day into a genuine and personal idiom. The result was a generous, elegant, if somewhat crowded and heterogeneous composition with an air of pretentiousness. It soon became apparent, however, that his development was to proceed in other directions."

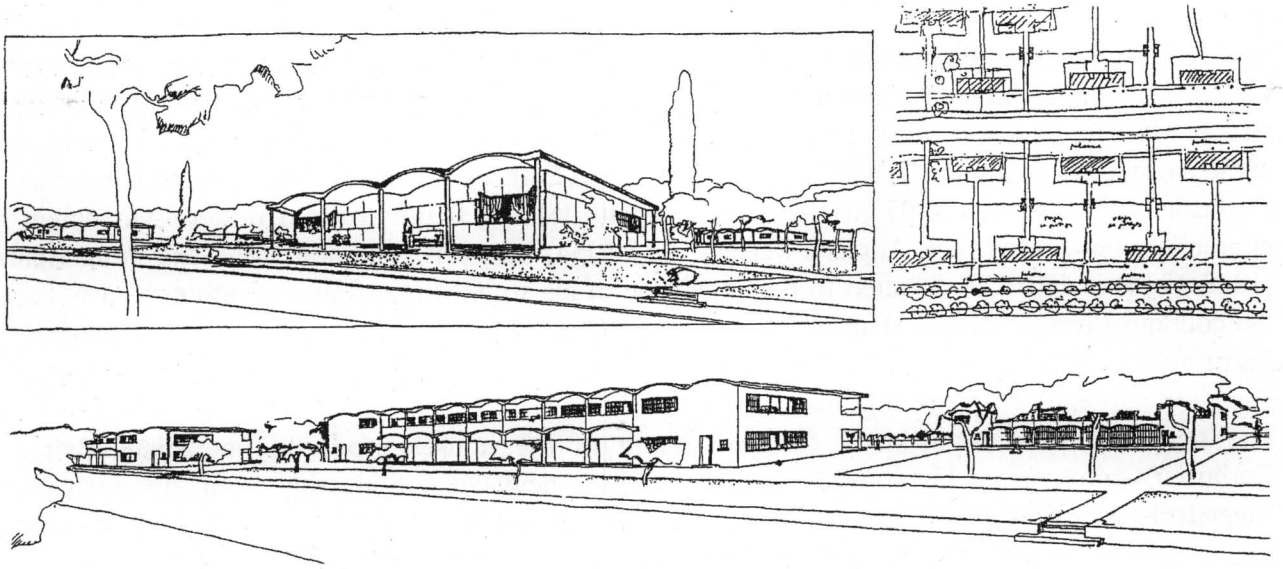
However, the development of the Dom-ino structural system, commenced in October 1914, remains Le Corbusier's principal architectural accomplishment of his formative years. Since his exposure to Perret's work in Paris, Le Corbusier had been immersed in the potential of reinforced concrete –

1 Although Le Corbusier never received an official architectural education, Baker, G., 1996, *Le Corbusier – The Creative Search* (London: E & FN Spon), 13, mentions that he did study architecture for a year at L'Ecole des Arts et Métiers under L'Eplattenier's tutelage in 1904. Evidently, L'Eplattenier studied both art and architecture at L'Ecole des Beaux Arts in Paris, but it is more likely that he only attended a course in the latter and was consequently not adequately qualified to register as a practising architect. As a result, Le Corbusier's architectural training must have been rudimentary and his technological knowledge minimal, hence his desire to serve apprenticeships to distinguished architects.

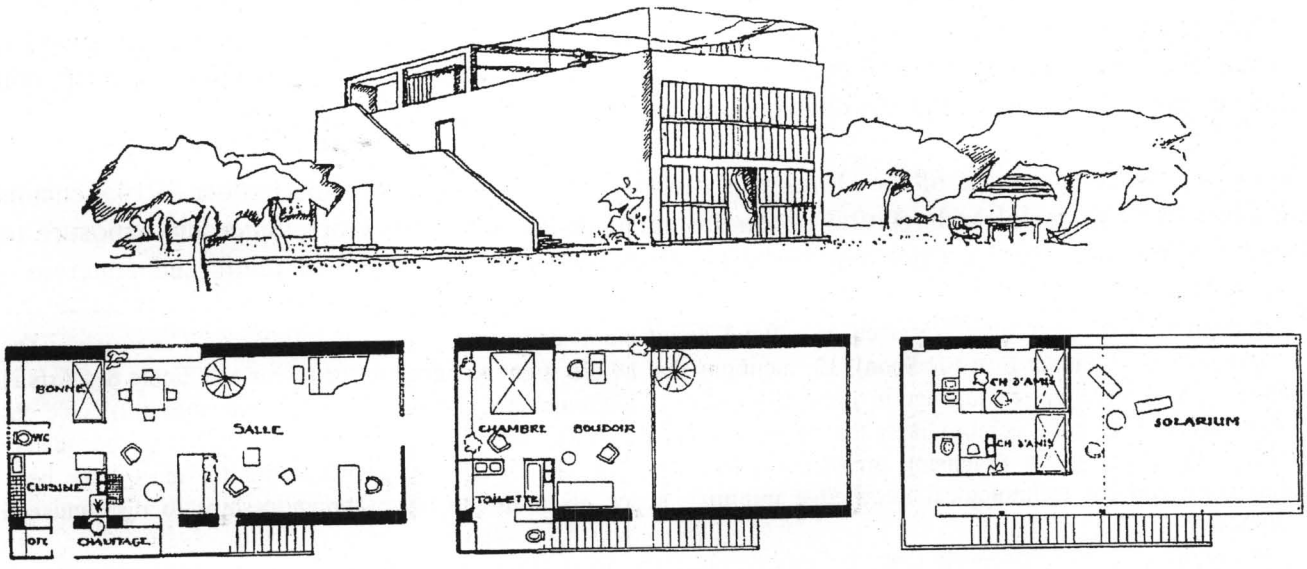
2 Many sources claim erroneously that Le Corbusier had also worked for Hoffmann. Baker (*ibid.*: 112), refers to an interview with Le Corbusier in the early 1960s in which he stated that he never did.



8.7 Dom-ino structural prototype (1914).



8.8 Maison Monol, project (1919).



8.9 Maison Citrohan 1, project (1920).

an enthusiasm shared with his childhood friend, Swiss engineer Max du Bois (1884-c. 1976). Du Bois was familiar with the technical aspects of reinforced concrete since he had translated into French in 1909 the first book on the subject, entitled *Eisenbeton Bau* (1906), by E. Mörsch. [3] The anticipated destruction of the then-raging First World War prompted Le Corbusier's and Du Bois's investigation into the use of concrete in the domestic field. They were convinced that this building material, held in low esteem by the architectural profession and predominantly used in the field of engineering, would be ideally suitable for housing constructed *en masse*. Their proposal of a reinforced concrete framework, termed Dom-ino – an amalgamation of the Latin for house (*domus*) and the game of domino – consisted of consecutive roof slabs, connected by a cantilevering staircase, and was supported by a grid of concrete columns (*fig. 8.7*). This structural prototype was to be prefabricated, erected on site and completed by its inhabitants – preferably using standardized building components. [4]

The Dom-ino proposal was modelled on Mörsch's monolithic frame design for factory construction and not the Hennibique system (designed by a French engineer of that name) as often claimed (Baker, 1996: 216). Although similar to the Hennibique system, Dom-ino differs with regard to the simplified columns that were recessed from the periphery of the roof and floor slabs. This modification, after Mörsch's example, liberated the façades from all structural constraints. Le Corbusier's and Du Bois' contribution was that they had developed a structural prototype that was suitable for domestic use. In the first volume of his *Oeuvre Complète* (1929; 1964: 13), Le Corbusier's reflects:

> "We have then produced a way of building – a bone structure – which is completely independent of the functional demands of the house plan ... allowing for numerous combinations of internal disposition and every imaginable handling of light on the façade."

Unlike the two preceding models that relied exclusively on the pragmatics of load-bearing efficiencies, the dimensions of the various structural relationships were, from the outset, modified according to the ratios of the Golden Section.

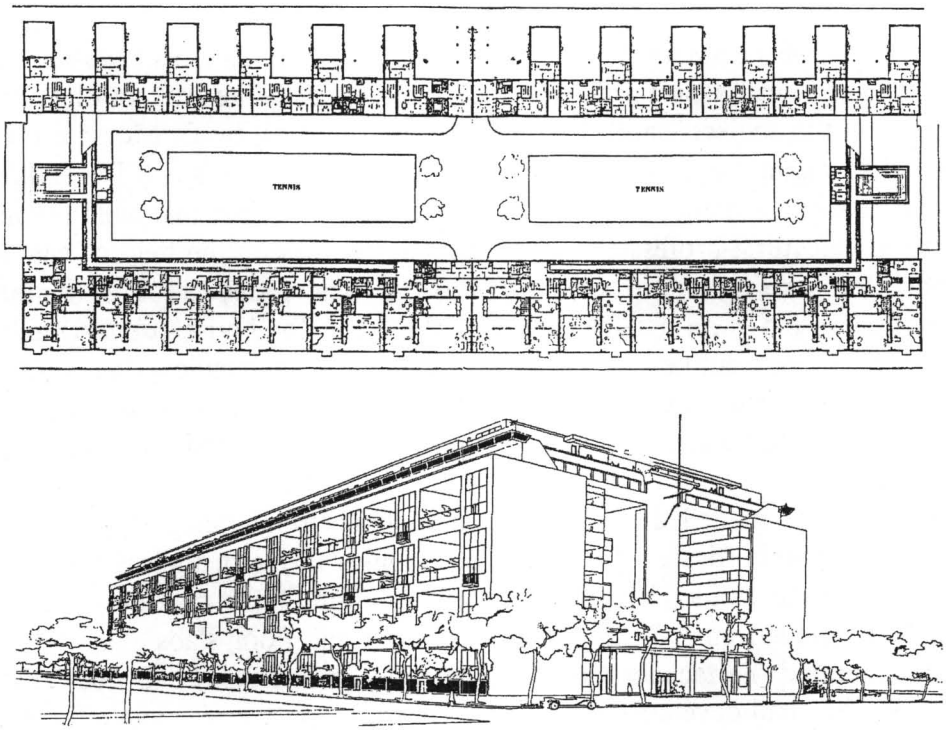
A comparison of the Dom-ino derivatives that were conceived of before and after Le Corbusier's intellectual alliance with Ozenfant, vividly demonstrate the influence of the visual arts on his consequential design repertoire. It was only after the genesis of Purism that the latent potential of this rudimentary structural innovation was taken advantage of. Yet, as Alan Plattus (1987: 17) poignantly remarks:

> "That Le Corbusier could as early as 1915, identify the generic conditions of modern construction, subject them to the typological analysis required by his classicizing predilections, and summarize the results in an icon so potent and concise that it would rival Laugier's primitive hut as a constructive emblem of its era, is remarkable enough."

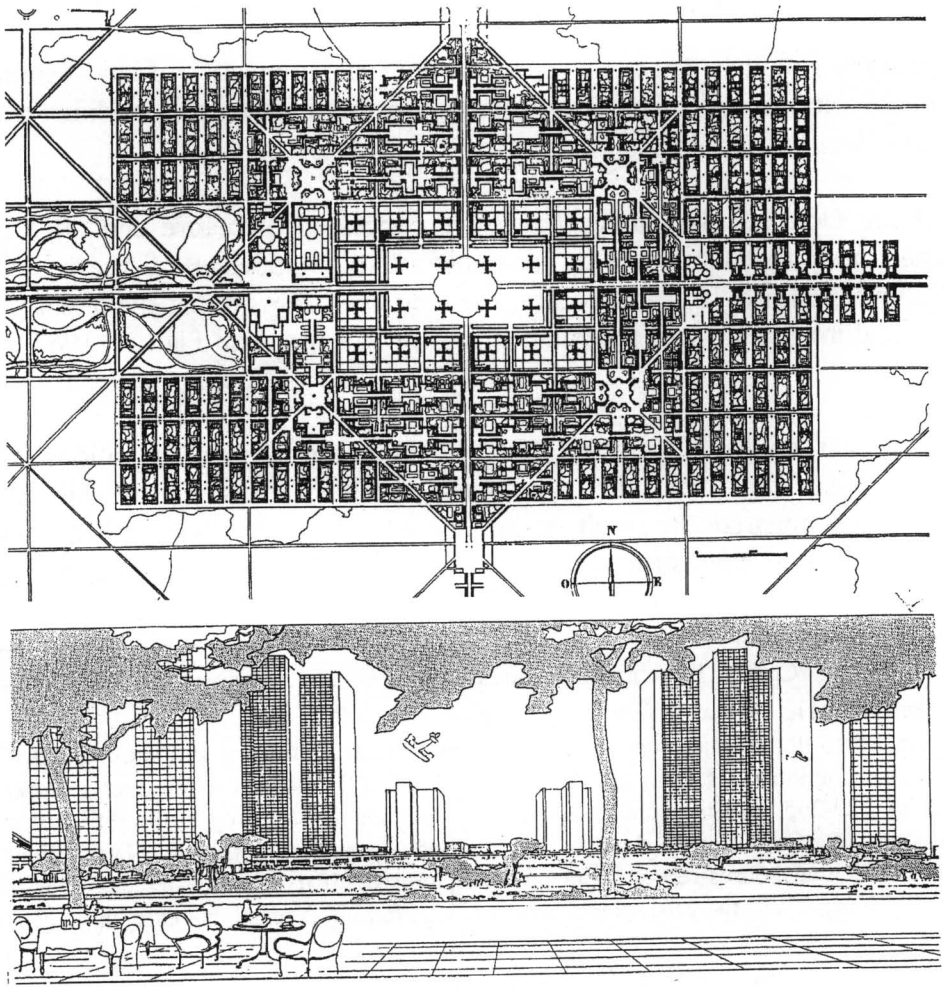
---

3 See Lowman, J., Oct. 1976, "Corb as Structuralist Rationalist", *Architectural Review*: 229-233, for an account of the prominent role Du Bois played in the development of Dom-ino.

4 Le Corbusier and Du Bois inferred that Dom-ino was to be prefabricated, but they did not elaborate. It is only in the chapter entitled "Mass-Production Houses" in Le Corbusier, 1923; 1987, *Towards a New Architecture*, trans. Morgan, M. (New York: Dover), 229-265, that the concept is expanded. Although admitting to the difficulties inherent in the mass-production of houses, Le Corbusier (*ibid.*: 233, 235) retorted with eternal optimism: "The difficulties of transport are at its height: it is clear that houses represent an immense tonnage. If it would be reduced four-fifths, that would indeed be up-to-date!", adding, "Will the yard soon be a factory? ... Nothing is ready, but everything can be done."



8.10 Les Immeubles-Villas, project (1922).



8.11 Une Ville Contemporaine, project (1922).

8.3. PERIOD OF INVENTION (1917 - 1922)

8.3.1 Domestic Prototypes

The genesis of Purism coincided with Le Corbusier's decision to move from Switzerland to France in February 1917. With the exception of an abortive housing scheme for Normandy, commenced in ay 1917 and of which but two of the intended 30 units were ultimately constructed, [5] Le Corbusier only managed to secure another built commission six years after the completion of Villa Schwob. Although financially one of the most adverse periods in his life, compounded by a series of failed commercial ventures, [6] the years between 1917 and 1922 were the most invigorating from a creative and intellectual point of view. Peter Serenyi's reference (1975: 69) to this phase of Le Corbusier's career as the "period of invention", is a fitting description of the priorities that the architect had identified and remained committed to from this point onwards. The adoption of the pseudonym "Le Corbusier" in 1920 was symbolical of the new theoretical insights gained during this period of academic consolidation and transformation.

Apart from distinguishing himself as a writer, theorist and painter, Le Corbusier also furthered his architectural interests. In response to the modern polemics, investigations into so-called universal dwelling were pursued on both a micro and macro scale. This preoccupation led to the development of his pivotal generic housing prototypes, Maisons Monol (1919, *fig. 8.8*) and Citrohan (1920-1921, *fig. 8.9*); the collective housing unit, Les Immeuble-Villas (1922, *fig. 8.10*); and the ambitious and highly contentious urban planning proposals, Une Ville Contemporaine (1922, *fig. 8.11*) and Plan Voisin (1922).

8.3.2 Vers une Architecture

Le Corbusier's theoretical inquiries culminated in the publication of his influential manifesto on modern architecture, *Vers une Architecture*, of 1923. [7]

Although the first purist publication, *Après Le Cubisme* of 1918, called for the establishment of a new artistic movement, Le Corbusier and Ozenfant had already alluded to a new type of architecture that would address the industrial *Zeitgeist*, as this translated extract from Bosson (1995b: 28-29) indicates:

> "A new spirt rules – an *esprit nouveau*. Buildings borne by this new spirit emerge everywhere, the seed of a new architecture. Here harmony, severity and a respect for regularity and clarity are already found. Huge buildings like bridges and factories already carry the seed for a new development ..."

These views were expanded upon in a series of articles published in *L'Esprit Nouveau* which, but for one additional chapter, "Architecture et Revolution", were collectively published as *Vers une Architecture*.

---

5 Baker (1996: 240) is the only source encountered that makes mention of the Normandy housing scheme that was allegedly traditional in appearance.

6 See Lowman, 1976, "Corb as Structuralist Rationalist": 229-233, for a detailed account of Le Corbusier's numerous, though unsuccessful, business ventures initiated after moving to Paris in 1917. In particular, Le Corbusier was intent on patenting the Dom-ino system but failed to find the necessary sponsorship – the primary reason for his emigration to France.

7 The extent of Ozenfant's contribution to *Vers une Architecture* has still not been clarified satisfactorily. Baker (1996: 267) mentions that Ozenfant said at some unspecified occasion that he had only supplied the illustrations. However, Ozenfant, A., 1931; 1952, *Foundations of Modern Art* (New York: Dover), 328, refers to joint authorship: "In *L'Esprit Nouveau* we presented a series of articles on architecture ... in 1923 some of these articles were remodelled and became the contents of *Vers une Architecture*. When the work was reprinted it bore the sole name, Le Corbusier".

In *Vers une Architecture* (1923; 1987: 19) Le Corbusier states that, when compared to the visual arts – "the first to have attained attunement with the epoch" – and the engineering profession – "the heroes of the new dawn" – the architectural discipline lagged far behind and existed in "an unhappy state of retrogression". Evidently, these frustrations spawned his aspiration to provide a new theoretical foundation for an architectural expression that responded to modern circumstances.

Vers une Architecture, although an iconography of modernity, was predicated upon classical aesthetic values. Its principal argument comprises a comparison of engineered phenomena with timeless, historical edifices, substantiated by biomorphic analogies: the principle that design evolution was based on economy of effort, and selection (a theme extensively explored in his seminal essay on purist art, "Le Purisme", of 1921). Von Moos (1979: 49) points out that the correlation between Classicism and industrial products was not new since this hypothesis had already been advanced by both Hermann Muthesius (1861-1927) and Behrens as part of Deutsche Werkbund philosophy, which Le Corbusier had been familiar with since working Behrens a decade earlier. Banham (1960a; 1996: 205), in turn, refers to Plato's implied reference to manufactured objects to which there was wide accent in artistic circles since 1911. Baker (1996: 268), however, maintains that the reason why Le Corbusier's precepts were so influential was "due to Le Corbusier's passionate advocacy of [these ideas], his skillful manipulation of the discussion to obscure deficiencies in the argument itself".

It is noteworthy that in addition to *Vers une Architecture*, Le Corbusier published three other books during this period. These included *L'Art Décoratif Audjourd'hui*, (*The Decorative Art of Today*), *Urbanisme* (*The City of Tomorrow and its Planning*) and *La Peinture Moderne*, all published in 1925.

8.3.3 Purist Villas (1923-1929)

The years 1923 to 1929 were Le Corbusier's most productive from a practical point of view. Yet, despite his vision to create a social utopia comprising housing typologies for the idealized, egalitarian *homme-type* with his *tabula rasa* mindset, his theories were realized in a series of so-called bourgeois villas for the cultured few who could both appreciate and afford them.

With the exception of the workers settlements at Liège and Pessac, and demonstration dwelling units built in Paris and Stuttgart, the Purist villas were individualized, programmatic adaptations of each of his client's requirements. However, Le Corbusier's stubborn commitment to theoretical prototypes enabled him to transcend compromise and circumstance, regarding every design commission as an opportunity to expand his plastic repertoire. [8] These designs were consistently based on the Citrohan prototype and Dom-ino structural model. His purist repertoire commenced with the designs of Villa Besnus (Villa Ker-Ka-Ré), Vaucresson, and Atelier Ozenfant, Paris, in 1923, and culminated in the penultimate dwelling and ubiquitous icon of modernity, Villa Savoye, Poissy, completed in 1931.

8.4 THE CORRESPONDENCE BETWEEN PURIST ART AND ARCHITECTURE

Despite Le Corbusier's reiteration of the dependence of his architecture on his paintings – albeit mostly later in his life and thus retrospectively – he failed to elaborate on this premise. It may have been that the connection between his purist art and architecture seemed so obvious to him that it required no clarification. However, considering that he was such an ardent theorist, coupled with the fact that his architectural premises were clarified in conjunction with his artistic doctrines, the omission of this corresponding influence is perplexing. The artistic reference is conspicuously absent when

---

8 Refer to Benton, T., 1987, *The Villas of Le Corbusier 1920-1930* (New Haven: Yale Univ. Press) for the most comprehensive documentation of the circumstances surrounding the realization of the respective purist villas.

examining *Vers une Architecture* from that point of view. In this work, Le Corbusier (1923; 1987: 19, 20) commented only in passing on how painters and sculptors – "the champions of the art of today" – had "outsped" the other arts. He also refrained from including any of his paintings to demonstrate the similarity in approach. When Le Corbusier (*ibid.*: 20) did refer to art, it was in a collective sense and merely how architecture qualified as a manifestation of art.

Another possibility is that the artistic connection was an unpopular view which Le Corbusier intentionally down-played, especially when considering the inflammatory critique of 1929 by Czech architectural critic Karel Tiege (1929;1975: 41, 43) of his Mundaneum project, though applicable to all his purist buildings:

> "The Mundaneum, in its glaring historicism and academicism, reveals that in the modern world architecture as an art [*sic*] is impossible. Furthermore, the Mundaneum highlights the failure of those aesthetic and formalistic theories of Le Corbusier which we have always opposed from the constructivist viewpoint: the theory of the Golden Section, of geometric proportionality, in short all *a priori* aesthetic formulae deduced from a formalistic perception of historical styles."
> "... a fiasco of aesthetic theories and traditionalist superstitions ..."

Tiege's views were shared by the Constructivists and the proponents of the Neue Sachlichkeit – opinions that caused Le Corbusier considerable anxiety. [9]

Notwithstanding, this study discovered that the connection between his art and architecture is far more complex and multi-faceted than Le Corbusier had inferred. To Bosson (1995b: 40), for example, a reading of his purist paintings – particularly, *Nature Morte Pâle à la Laterne* (1922, *fig. 7.16*) – evokes lyrical associations of cityscapes comprising an assortment of building types:

> "The bottles become towers, the dices are like small tower blocks in the urban picture, the drinking glass a rotunda with arcades. One finds bridges, gates, tunnels and labyrinths. The lid of the coffee pot make [*sic*] up a soft, rolling landscape which the surrounding architecture is adapted to. The mouth of the bottle is a pale moon. The eye runs across a greyish nacreous haze – perhaps it is the ambience of Paris?"

Such preconceived analogies are questionable. Not only because they are highly subjective and architecturally prejudiced, but also because there is no written or verbal evidence that Le Corbusier's painterly imagery had been derived from, or intended to depict, anything other than utilitarian (versus habitable) artefacts. Perhaps with the exception of his very first purist still-life, *La Cheminée* – an abstract hommage to the Parthenon, hence the additional title *Acropolis* [10] – Le Corbusier never incorporated any built structures into his paintings, which serves as a case in point.

---

9 According to Serenyi, P. (ed.), 1975, *Le Corbusier in Perspective* (New Jersey: Prentice-Hall), 3-4, the first critiques on Le Corbusier's architecture appeared in the late 1920s and represented two schools of thought. The so-called conservatives – German historian Cornelius Gurlitt and the English critics, Trystan Edwards and S. D. Adshead – found his urban proposals outrageous and communist in orientation. The second contingent – including Tiege, Lissitzky and Hannes Meyer – represented the Marxist-inspired views of the Neue Sachlichkeit. They, in turn, were eminently critical of Le Corbusier's aesthetic approach to his work, which, in their opinion, was contrary to utilitarian considerations. Le Corbusier took their criticism to heart by reiterating his commitment to a machine-inspired Functionalism – though combined with "poetic imagination" – in his article "Défense de l'Architecture", published in Tiege's journal *Stavba* in 1929.

10 Naegele, D., 1995, "Photographic Illusionism and the 'New World of Space'" in Bosson, V., Von Moos, S. and Naegele, D., *et al.*, *Le Corbusier, Painter and Architect*, exhibition catalogue, Nodjyllands Kunstmuseum, Copenhagen (Denmark: Linde Tryk), 115, refers to the following comment made by Le Corbusier to Lucien Harvé (the photographer of most of his purist buildings) regarding *La Cheminée*: "If only you knew how I was overwhelmed in doing it in the memory of the Parthenon."

Furthermore, none of the footprints of any purist painting was ever pragmatically adapted as the De Stijl architects had done with Mondrian's elemental compositions. Contrary to Bosson's interpretation, neither do any of Le Corbusier's geometric montages resemble any side views of his purist villas. [11] The plans of his buildings and their corresponding elevations read as beautiful graphic compositions in their own right, but none were any ever transformed into paintings. Guedes (1988: 23) rightly points out that the transmogrifications of Mondrian's abstractions were far more literal than anything ever attempted by Le Corbusier:

> "De Stijl was the movement in which painting and architecture came the closest to each other ... The dependence of Le Corbusier's seminal ideal villas, Ozenfant, La Roche-Jeanneret, Cook, Guiette, Cannile, Garches and Savoye on his own purist paintings is of another order; it is of a complex and poetic nature."

The same argument applied to De Stijl can be extended to the Soviet avant-garde and their tectonic translations of Malevich's suprematist compositions, which were also far less arduous than Le Corbusier's approach.

The ensuing distinctions not only emphasize, but also systematize and clarify this highly complex symbiotic relationship between Le Corbusier's purist art and architecture.

8.5 FORMAL PREOCCUPATION

In reviewing the formal component of Le Corbusier's purist architecture, the following hypotheses are presented:

1. It was primarily due to a preoccupation with form that purist doctrine materialized.

2. Le Corbusier's approach to form was derived from two independent points of departure – the one methodological, the other metaphysical.

3. It was only once the methodological and metaphysical premises had been synthesized through the medium of painting, that the transformation of his architecture occurred.

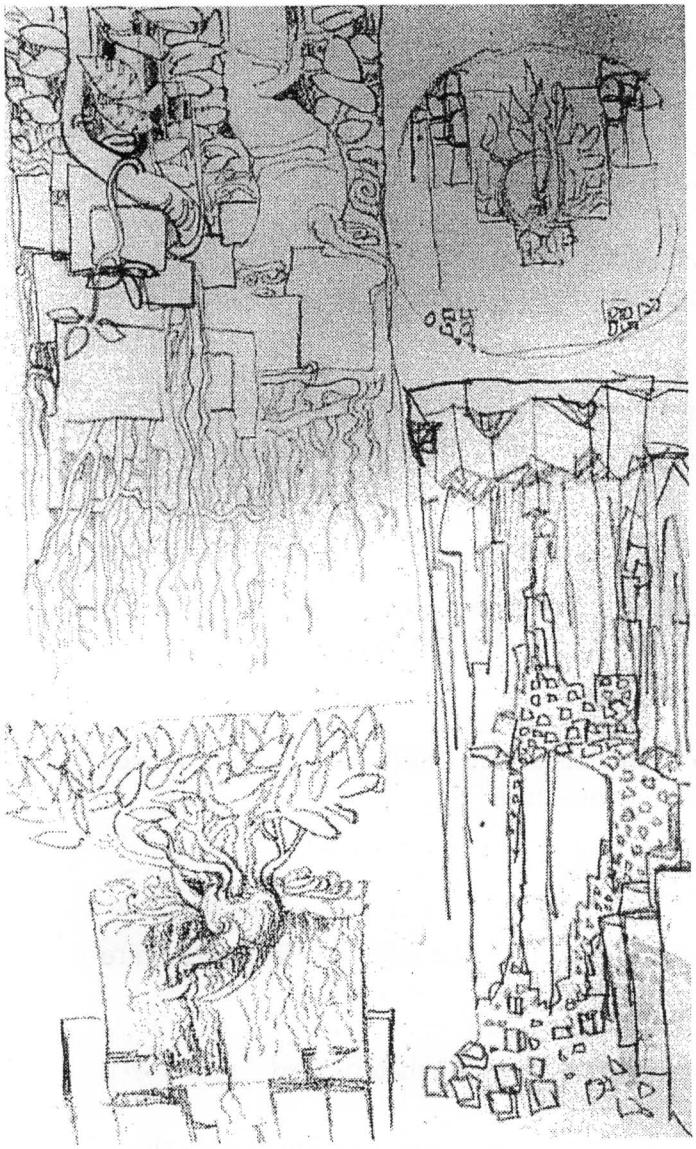
8.5.1 The Methodological Approach to Form

Le Corbusier's methodological approach to form can be traced to his decorative arts training – a discipline conducive to stylization and abstraction. The role that L'Eplattenier played in this regard is of cardinal importance. As an ardent discipline of the theories of John Ruskin (1819-1900), L'Eplattenier considered nature as precedent for decorative design. However, L'Eplattenier did not tolerate a representational approach but advocated, instead, an analytical study of the organizational structure of natural form. In *L'Art Décoratif d'Aujourd'hui* (1925; 1987: 194) Le Corbusier recalled:

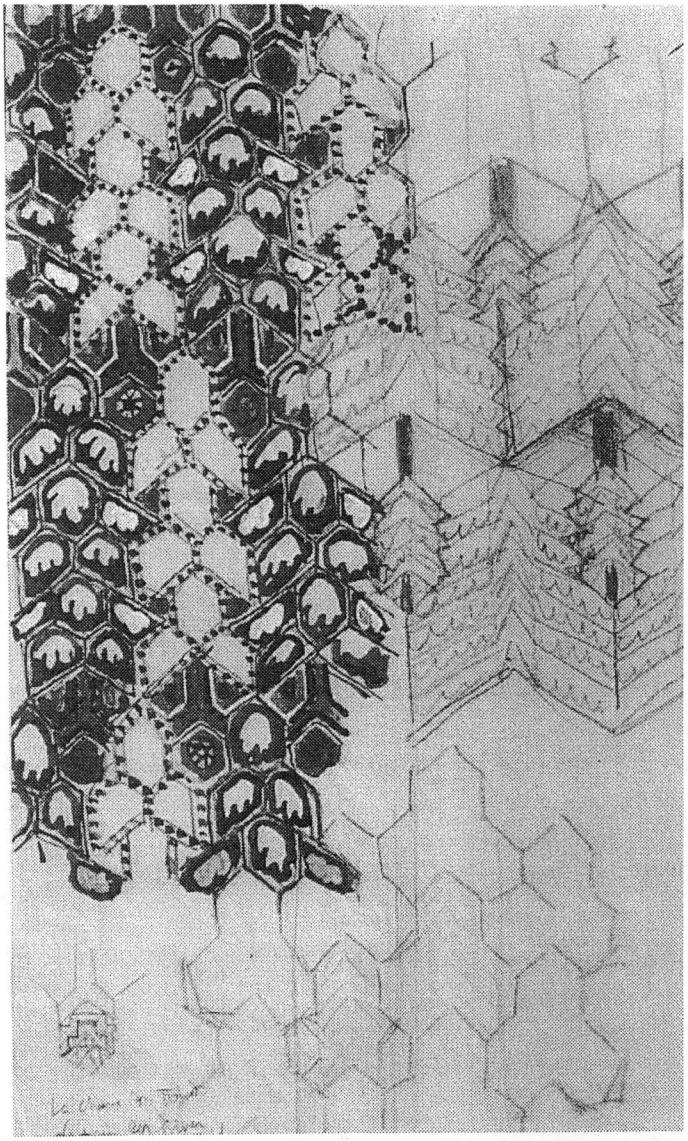
> "My teacher had said: 'Only nature can give inspiration, can be true, can provide a basis for the work of mankind. But don't treat nature like the landscapists who only show its appearance. Study its causes, forms and vital development, and synthesize them in the creation of ornaments."

---

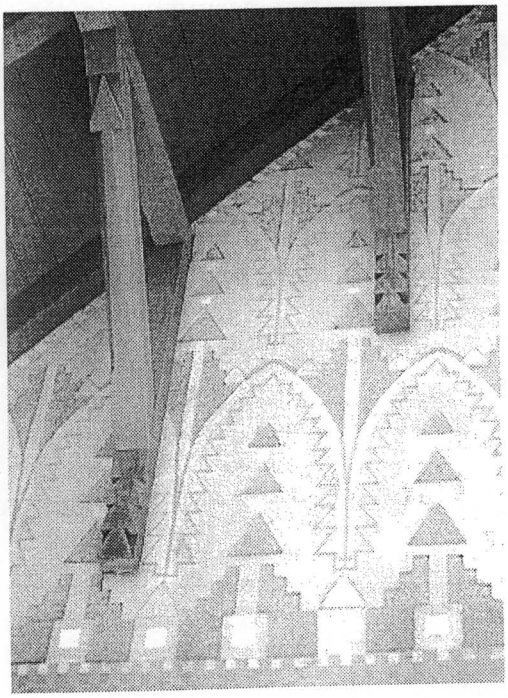
11 Von Moos, S., 1979, *Le Corbusier, Elements of a Synthesis* (Cambridge, Mass.: MIT Press), 284, refers to one instance where Le Corbusier "adopted the proportional lines of an earlier painting (1929-1931) for the façade of one of his skyscraper projects for Algiers". Von Moos claims that there are more examples, but he did not mention any.



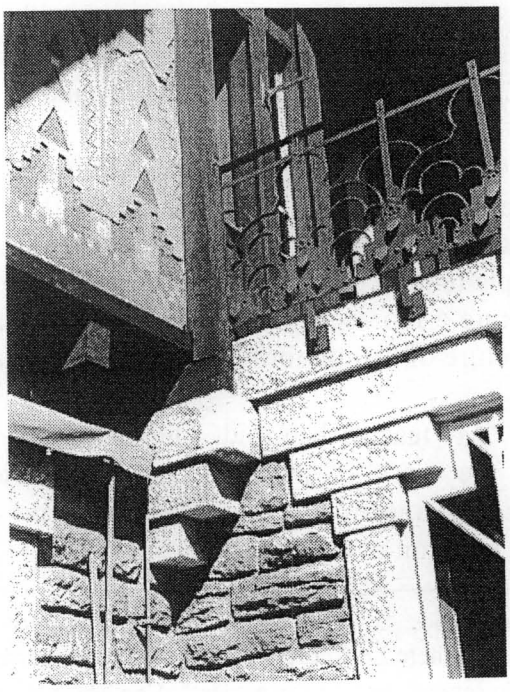
8.12 Studies of plants and rock formations (1904).



8.13 Designs derived from pine trees (1911).



8.14 Detail, Villa Fallet, La Chaux-de-Fonds



8.15 Detail, Villa Fallet, La Chaux-de-Fonds (1905)

L'Eplattenier's convictions were also derived from the dictum by Owen Jones, outlined in the definitive compendium of decorative art at the time, *The Grammar of Ornament* (1856), that natural forms should always be stylized before being appropriated as ornament. In the words of Le Corbusier (1925; 1987: 133):

> "We had been told: Go and explore in the in the calm of the library the great compendium by Owen Jones ... This without question, was serious business. The pure ornaments which man had created entirely out of his head followed one another in sequence. Yes, but what we found there was overwhelmingly man as part of nature, and if nature was omnipresent, man was an integral part of it, with his faculties of crystallization and his geometric formation."

The decorative designs Le Corbusier did as a student (*figs 8.12-8.13*), together with the ornament applied to his earliest architectural commissions in La Chaux-de-Fonds (*figs 8.14-8.15*), show a preference for the geometric stylization of natural phenomena. Von Moos (1968; 1975: 14) attributes the deviation from the undulating shapes and forms, characteristic of then-prevailing Art Nouveau design idiom, entirely to the L'Eplattenier's teaching:

> "There is, however, a very significant difference between the naturalism of these architectural decorations and the naturalism in the works of the major contemporary architects of the *Jugendstil* era. However much of the works of van de Velde in Belgium an Germany, Guimard in Paris, or Gaudì in Spain varied in style, they still had in common an organic representation of nature. Jeanneret, on the other hand, translated the inspiration of nature into a strict, geometric language. This was obviously a result of L'Eplattenier's teaching."

Paul Turner (1971; 1975: 19) suggests that exposure to the more "sober decorations" of the Germanic derivative of Art Nouveau, Jugendstil, was another reinforcing influence.

It is noteworthy that there is no correlation whatsoever between this methodological approach to form and any of Le Corbusier's pre-purist buildings. This is particularly evident in his architecture excecuted between 1905 and 1908 where the formal appearance of his buildings were a synthesis of the Art and Crafts, Jugendstil and Swiss vernacular traditions, and with the stylized decoration applied independently. It was only after his exposure to the Rationalism advocated by Perret and Loos's stance against the superfluousness of architectural decoration, that Le Corbusier's architecture became less ornamental as other design priorities and social considerations intensified.

8.5.2 The Metaphysical Approach to Form

Turner (*ibid.*: 20) suggests that L'Eplattenier's insistence on a methodological approach to form alluded also to an underlying metaphysical attitude that was derived from the Platonic notion of an idealized formalism:

> "On the one level, [the conception of ornament as a microcosm] can be seen as a call for understanding the organic structure of natural forms, and this is surely part of what L'Eplattenier meant. But in light of Jeanneret's reading at this time (some of which L'Eplattenier suggested to him), we shall see that there was probably a deeper meaning as well – a Platonic conviction that one must penetrate beneath the superficial appearance of nature and seek out the ideal, universal reality. Each form thus idealized by the artist would become a 'microcosmos' of the divine Idea."

Research conducted by Turner for the essay, "The Beginnings of Le Corbusier's Education, 1902-07" and subtitled "Jeanneret's Early Reading" (1971; 1975: 21-25), indicates that Le Corbusier's interest in metaphysical values was derived from specific literary sources, recommended to him by L'Eplattenier as early as 1904. Two books in particular, *L'Art de Demain* (1904) by Henry Provensal and *Les Grands Initiés* (1889) by Edouard Schuré, are said to have lain the philosophical foundation for Le Corbusier's due metaphysical approach to form and essentially idealistic convictions that informed his architecture throughout his life.

The philosophical content of both books was an extension of a Germanic-inspired idealism. According to Turner (1971; 1975: 22), *L'Art de Demain*, devoted to art theory and general philosophical issues, "may well have been the first such book Jeanneret read, and in any case he seems to have been greatly impressed by its ideas, some of which reappear almost unchanged in the architectural theory of Le Corbusier". *Les Grands Initiés* lists the eight so-called great initiates who appear throughout history in different guises and always bear the same esoteric truths. Both books deal with the spiritual revival of modern civilization and the rejection of materialism. Provensal differs from Schuré in his attitude toward material reality, granting matter and spirit equal validity, and envisaging a new form of art that unites both. Schuré, in turn, views matter strictly in Platonic terms and, therefore, considered matter inferior to spirit. Art, according to such a definition, should be an expression of those spiritual, idealized forces. Of all the initiates listed by Schuré, including Plato and major religious figures, Pythagoras was considered the most relevant to modern man as his *esprit scientifique* resembled *l'esprit moderne* most closely. In this context, the word "scientific" does not refer to empirical activity but to abstract, *a priori* thought as encapsulated in Pythagoras' mystical numerology, anticipating the Modulor. According to Turner (*ibid.*: 23), Le Corbusier was particularly interested in this chapter, as evidenced by numerous personal annotations therein.

During his study tours, Le Corbusier's visits to the monuments of Graeco-Roman antiquity stimulated his ubiquitous appreciation for classical architecture. It also intensified his awareness of an idealized formalism that coincided with Pythagorean and Platonic thought. It is not surprising that, upon his return to La Chaux-de-Fonds, his projects were executed in a tempered classical idiom. These designs displayed an increasing use of purer geometries, the gradual simplification of both footprint and silhouette, and were strictly symmetrically organized. It is noteworthy that the introduction of *tracés régulateurs* to his architecture followed immediately after his journeys in 1911. Its application first emerged in the design of Villa Jeanneret-Perret, La Chaux-de-Fonds (1912), where it determined the disposition of the fenestration on the façades according to the ratios of the Golden Section. Le Corbusier continued this practice from this point onwards. On the authority of Baker (1996: 196), Le Corbusier made the following statement:

> "I built my own house when I was seventeen; it was covered with decorations. I was twenty-four when I built my second [fourth] house; I had travelled in the meantime. The plans of this house were lying on my drafting board. The year was 1911. I was suddenly struck by the arbitrary placing of the openings on the façade (the windows). I blacked them with a piece of charcoal; the black spots now spoke some kind of a language, it was an incoherent language. Again I was struck at the absence of a rule or law. Appalled, I realized that I was working in utter chaos. And then I discovered, for my own purposes, the need for a regulating device. This obsession would henceforth occupy a corner of my mind."

Gans (1987: 108) maintains that the abandonment of his eclectic Swiss regionalism was also due to Le Corbusier's familiarity with the book *Les Entretiens de la Villa du Rouet* (1908) by Alexandre Cingria-Vaneyre, who claimed that the Franch-speaking Swiss (the Suisse-Romande) should have an architecture reflecting classical rather than Germanic values:

"[Cingria-Vaneyre's nationalistic] argument for buildings of pure, geometric shapes agreed with Le Corbusier's early lessons concerning the spiritual essence of Platonic solids ..."

8.5.3 The Cubist Approach to Form

Bearing in mind Le Corbusier's familiarity with a methodological approach to form, it is not difficult to recognize why he would have felt a kinship with Cézanne – the first artist to introduce the process of stylization to the fine arts arena, transcribing his subject matter as geometric configurations. As Le Corbusier wrote in *New World of Space* (1948a: 150):

"Spheres, cones and cylinders: Cézanne announced it. With these fundamental means and these limited themes, and in a colour which makes everything come alive, the emotion can leap from the canvas."

Cézanne's so-called constructions after nature, as subsequently furthered by the Cubists, must have been instinctively comprehensible to Le Corbusier when he first encountered them – appealing to both his artistic and architectural sensibilities. This resulted, firstly, from the similarity of the process of abstraction – introduced to fine arts, in addition to the decorative arts. Secondly, the translation of natural phenomena into geometric entities endorsed the architectural premise that geometry underlies the structure of all built format as demonstrated, also, in nature.

Yet, there is no evidence to suggest that either Cézanne, Picasso or Braque attached any mystical properties to their decodified forms and shapes. The geometric forms that Cézanne introduced with his paintings followed from his intent observations of nature, serving solely as a pictorial record of the organizational structure of his subject matter. Cézanne even stated:

"The artist must scorn all judgement that is not based on an intelligent observation of character. He must be aware of the literary spirit which so often causes painting to deviate from its true path – the concrete study of nature – to lose itself all too long in intangible speculations". [12]

Picasso's intrigue with Cézanne's *modus operandi* was derived from an optical point of view and, specifically, how the latter artist had succeeded in creating an illusion of depth without relying on conventional procedures. This initial fascination, culminating in *Les Demoiselles d'Avignon*, was surpassed by the inexhaustible creative possibilities inherent in Cézanne's methodological (or reductive) approach to form. However, the decoded information was merely regarded by Picasso and Braque as the means to an artistic end. Consequently, their subject matter was considered subordinate to the creative process of abstraction, serving as the vehicle with which to conduct these novel pictorial investigations. The semiotic content of the object, including its imaginary reconstruction by the viewer, remained their principal conceptual preoccupation and intellectual point of departure. This is substantiated by the fact that even during the most visually obscure phases of Cubism, Picasso and Braque never relinquished their ties with the visible world. In fact, they were at pains to retain some link with reality – be it through collage or typology.

Ozenfant's early comment of 1916 that the worth of the Cubists does not lie in the absence of the depicted but in the beauty of the composition (Bosson, 1995b: 25), already anticipated the Purists' different approach to form and conceptual intent.

---

12 Excerpt from a letter Cézanne wrote to Emile Bernard, dated 12 May 1904; reprinted in Chipp, H. (ed.), 1968, *Theories of Modern Art* (Los Angeles: Univ. of California Press), 19.

8.5.4 The Purist Approach to Form

Following this train of thought, it becomes blatantly obvious why, from a methodological point of view, Le Corbusier, as decorative artist, could relate so comfortably to Cubism; but why, from a metaphysical premise, he, together with Ozenfant, was so critical of the Cubism practised by Picasso and Braque; and why they instead preferred the cubist interpretations and structured compositions of Léger and Gris.

The methodological approach to form, as demonstrated in fine arts, found precedent in purist painting through the increasing stylization of the subject matter during its rudimentary stage. This was furthered during the volumetric and, specifically, the last stage of Purism, when the subject matter was fragmented and the compositions were graphically reconstructed.

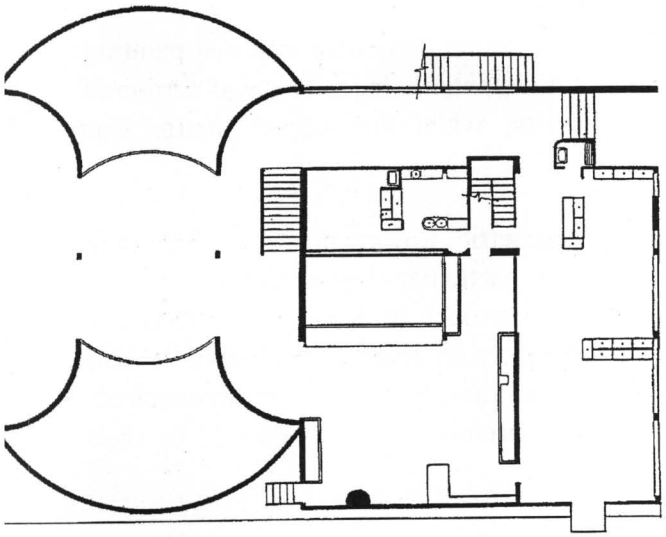
Since neither the esoteric assumptions ascribed to certain geometric forms, nor the underlying compositional structuring of their paintings, were considered of any particular consequence to Picasso and Braque, the Purists retorted accordingly. Their metaphysical approach to form was reflected in their choise of subject matter that demonstrated Euclidian geometry in their compilation. It also manifested in the organizing of the decoded (abstracted) forms according to metaphysically-inspired, numerological conventions. Lastly, their metaphysical functionalist premises were evidenced by their selection of utilitarian artefacts, qualified as *objets-types.*

In summary:

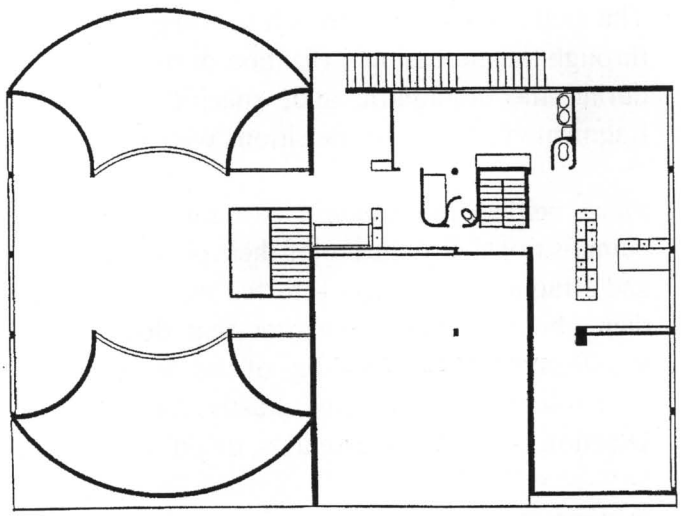
1. The pre-purist period of Le Corbusier's career, his decorative arts education, in particular, exposed him to a methodological approach to form that consisted of the abstraction of natural phenomena and their translation into geometric configurations, though exclusively intended for decorative purposes.

2. The literary sources consulted by Le Corbusier suggest that he was aware from a very early age of a metaphysical approach to form – an attitude that coincides with the classical notion that certain geometric forms are imbued with esoteric properties, which, supposedly, put Man, through their application, in touch with the harmony prevailing in nature. This conviction found expression in Le Corbusier's pre-purist architecture through a tentative use of purer geometries and the application of regulating lines, which, according to Serenyi (1975: 7), "[follows] the Platonic belief that geometry underlies the structure of the universe, the architect uses regulating lines forming various geometrical shapes to establish a harmonious link between his works and the universe" .

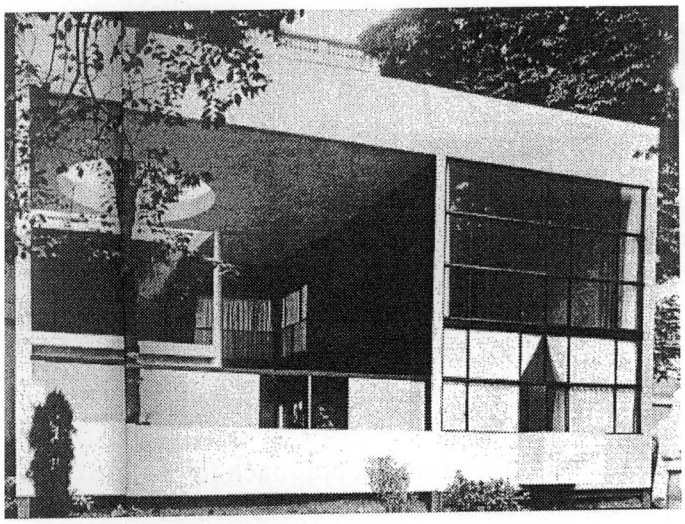
3. Turner (1971; 1975: 24) maintains that despite exposure to Perret's rational approach to form, Le Corbusier was never deterred from these, essentially, idealistic convictions, which ultimately found recondite expression in purist aesthetic theory. Even the Dom-ino structure, epitomizing rational design decision-making, encompassed a distinct metaphysical component due to the modification of its dimensions in accordance with 'ideal' proportions. According to Turner (*ibid.*): "From his 'Dom-Ino' system of 1914, and his 'Purist' forms and utopian urbanism of the 1920s, to his sculptural architecture and obsession with the 'Modulor' in his later years, Le Corbusier's work was to be characterized most essentially by a search for generalization, universality, and absolute formal truths which put Man in touch with a harmony underlying nature ..."



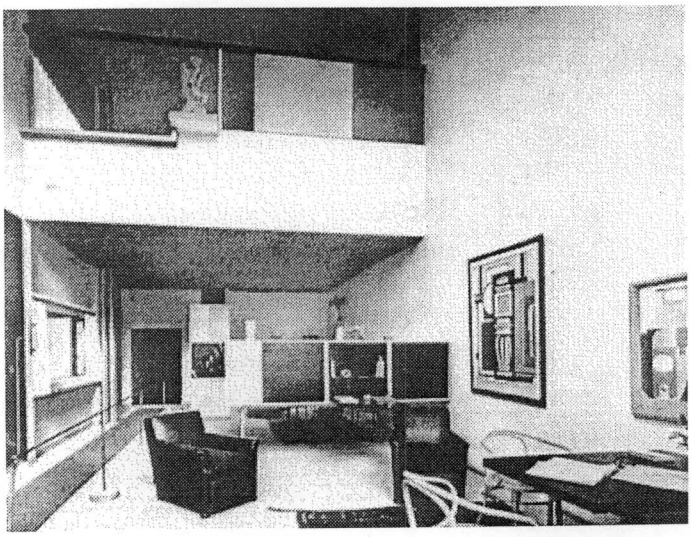
Ground floor plan



First floor plan



Exterior



Interior

8.16 Pavillon l'Esprit Nouveau, Paris (1925).

4. It was, however, through the medium of painting that these two independent approaches to form were synthesized. This manifested, firstly, in the manner in which the methodological process of abstraction had been applied to the subject matter and, secondly, how this abstracted information had been reconstructed according to esoteric numerological conventions – an autonomous design method that Le Corbusier had already pursued in his architecture.

5. It it was as a result of the synthesis between the methodological and metaphysical that the symbiosis between Le Corbusier's paintings and architecture finally occurred; that a methodologically-derived plastic repertoire, a metaphysically-inspired design methodology, and an intellectual doctrine evolved that were applicable to both fine arts and architecture.

6. Lastly, it was as a result of a preoccupation with form that Purist dogma materialized. It was Le Corbusier's inherent attitude to form that provided the conceptual impetus that certain type objects are, or should be, constructed in response to the laws of the universe, economy and selection. This is substantiated by the fact that the metaphysically-inspired, functional postulates and biomorphic analogues of Purism were deduced from the physical manifestation of (natural) form.

Tiege (1929; 1975: 41, 42) was undoubtably one of the first architectural critics who fully comprehended Le Corbusier's aesthetic intentions when he warned against "the danger of a utilitarian architecture with an artistic superstructure", adding that, "all this reveals the architect's work to be based on *a priori* aesthetic speculations rather than an analysis of actual conditions".

8.6 CONCEPTUAL RECONCILIATION

The conceptual reconciliation between Le Corbusier's paintings and his architecture is demonstrated best in the exhibition pavilion for the "Exposition Internationale des Arts Décoratifs", hosted in Paris in 1925 (*fig. 8.16*). Pavillon l'Esprit Nouveau synthesized all the diverse ideas explored during those innovative years of theoretical inquiry.

In the first volume of his *Oeuvre Complète*, Le Corbusier (1929; 1964: 104) stated his objectives as follows:

> "My intention was to illustrate how, by virtue of the selective principle (standardization applied to mass-production), industry creates pure forms; and to stress the intrinsic value of this pure form of art that is the result of it. Secondly, to show the radical transformation and structural liberties reinforced concrete and steel allow us to envisage in urban housing – in other words that a dwelling can be standardized to meet the needs of men whose lives are standardized. And thirdly, to demonstrate that these comfortable and elegant units of habitation, these practical machines for living in, could be agglomerated in long, lofty blocks of villa-flats."

The formal appearance, the spatial organization and the planning of the pavilion was an extension of the Citrohan dwelling prototype, made possible as a result of the Dom-ino structural system. The building was also a full-scale residential component of the Immeuble-Villas project that explored the concept of collective, high-rise dwelling. Dioramas of Une Ville Contemporaine and Plan Voisin, exhibited in the attached rotunda, illustrated the high density, urban environment to which these Immeuble-Villas belonged.

The pavilion and its contents served as a commentary on the prospects of the industrial culture, induced by the Machine Age. This anticipation extended from a macro scale – the futurist city designed for "speed and success" – to a micro scale – utilitarian artefacts qualified as "equipment for living". The carefully selected *objets-types* – laboratory flasks used as vases, Thonet chairs, and so forth – also acted as the subject matter of the purist paintings by Le Corbusier and Ozenfant that adorned the walls. As Le Corbusier comments in the preface to *L'Art Décoratif d'Aujourd'hui* (1925; 1987: xiv):

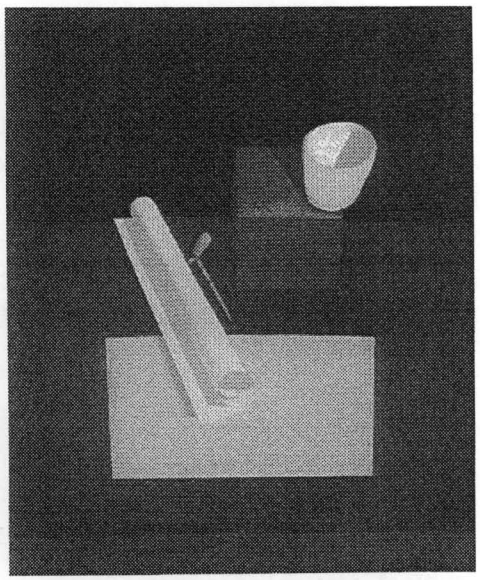
> "We had undertaken to put a pavilion of *L'Esprit Nouveau* which would indissolubly link the equipment of the home (furniture) to architecture (the space inhabited, the dwelling), and to town-planning (the conditions of life of a society)."

The same argument that was applied to the choise of the subject matter of purist painting was extended to purist architecture. Since the *objet-type* is a utilitarian artefact whose form evolved over time in response to its particular function, a state of perfection was reached due to this harmonious relationship between function and form (as exemplified by nature). Dom-ino – and the resultant habitable artefact – mimicked this conceptual premise in that its premeditated formal appearance was a direct response to its structural function, achieving the aspired sense of utilitarian harmony. Moreover, the title "Citrohan" was a play on the patent name of the Citroën automobile, indicating that a house – its building components and mode of assembly – could likewise be standardized and systematized. Consequently, both Citrohan and Dom-ino qualified as *objets-types* as their formal appearance had been determined and perfected by utilitarian considerations, structural requirements and processes of industrialization. Since the Citrohan dwelling unit was considered a machine for living, Dom-ino could be regarded as a structural apparatus. Paraphrased in the words of Frampton (1980: 152-153):

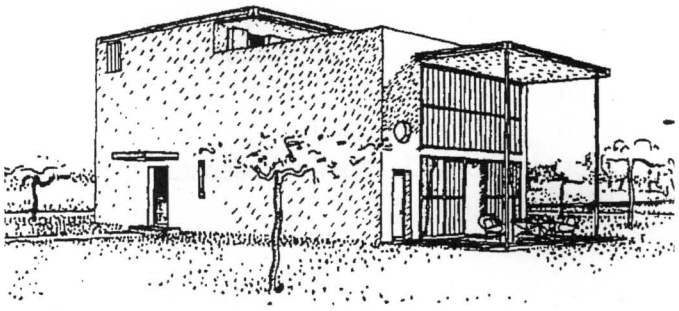
> "[Le Corbusier] wished to see the Dom-ino as a piece of equipment, analogous in its form and mode of assembly to a typical piece of product design. Such elements were seen by Le Corbusier as *objets-types*, whose forms had already become refined in response to typical needs."

The alleged harmony that existed between function and form was apparent also in the equilibrium that prevailed between the respective components and the whole. Not only were the format of purist paintings and the distribution of their painterly content determined by the exact same system of proportion, but so, too, the column intervals and all corresponding dimensions of Dom-ino and the resultant pavilion. This preoccupation was even extended to the footprint of the master plan of the futurist city. Thus, the same mathematical conventions employed to govern the pictorial organization of the painterly composition determined the compositional realization of the building, including its macro environment.

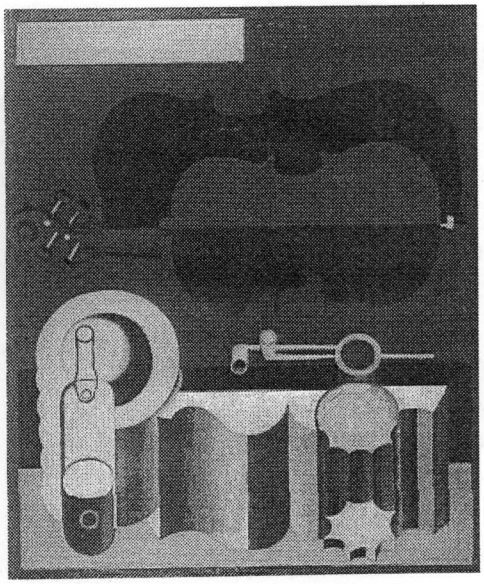
Pavillon l'Esprit Nouveau is a vivid demonstration of Le Corbusier's holistic approach to the design-related environment, encapsulating the notion of total design. The reference to Purism as a cultural aesthetic serves as the most appropriate description of this building in its conceptual totality, encompassing the new spirit of the industrial age from which its name was derived. Lastly, the conceptual premises which Le Corbusier ascribed to man-made artefacts endorse his biomorphic analogies since he considered the industrial era the modern incarnation of nature.



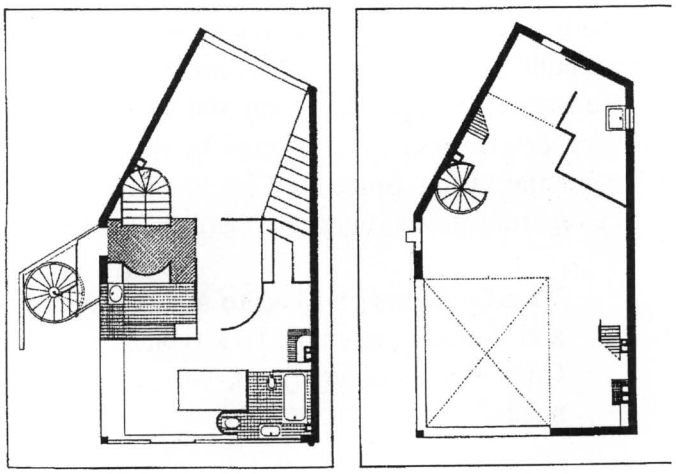
8.17 *Le Bol Rouge* (1905).



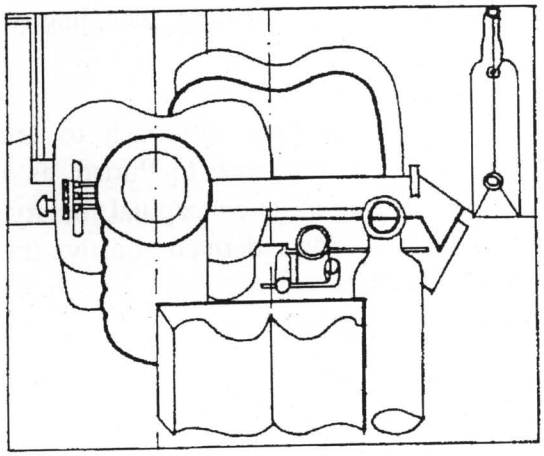
8.18 Maison Citrohan, variation, project (1922).



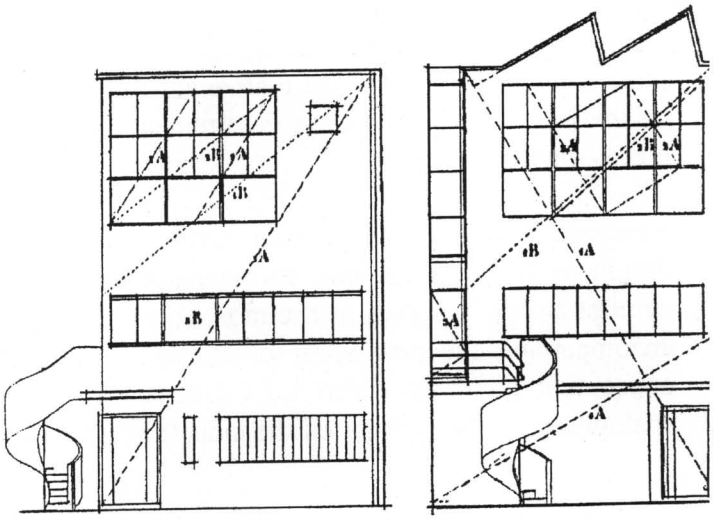
8.21 *Nature Morte au Violin Rouge* (1920).



First floor plan Second floor plan



8.20 *Nature Morte à la Pile d'Assiettes* (1920).



Elevations

8.21 Atelier Ozenfant, Paris (1923).

8.7 PLASTIC REPERTOIRE

In the interview conducted with Bosson (1995a: 13) in 1962, Le Corbusier commented as follows:

> "Since 1918, I've painted practically every day. It is through painting that I've found the forms for my architecture: already from the beginning, I felt how it was to grow from my still-lifes."

Despite Le Corbusier's aforegoing statement, the connection between specific examples of his paintings and purist dwellings remains theoretical. Notwithstanding, the formal simplicity of his Maisons Citrohan (1920, 1921) do recall the paintings of 1918 and 1919 that were produced during the rudimentary stage of Purism (*figs 8.17-8.18*)– an opinion shared with Baker (1996: 264):

> "[Le Corbusier always] tended towards complexity, yet interestingly he usually began by using a simple theme, gradually building up the elaboration. *La Cheminée*, *Le Bol blanc* and *Le Bol rouge* are in this vein, and in his architecture around this time he began with the simple ideas of the Citrohan and Monol prototypes, gradually extending their range."

To Guedes (1988: 23), Atelier Ozenfant is considered the most vivid realization of purist painting:

> "It is the most pure of all the architectural equivalents of their purist paintings. The house is also a shallow box containing various levels, volumes and simple geometric elements within the frame of its boundary walls. The whole composition converges on the 'cube of light' of the studio which is the architectural equivalent of the cube in 'Le bol rouge' of 1919. The two spiral stairs, one internal, one external, are like the upright cylindrical bottles in the paintings."

Gans (1987: 62), too, refers to the correlation between Villa Savoye and purist still-lifes:

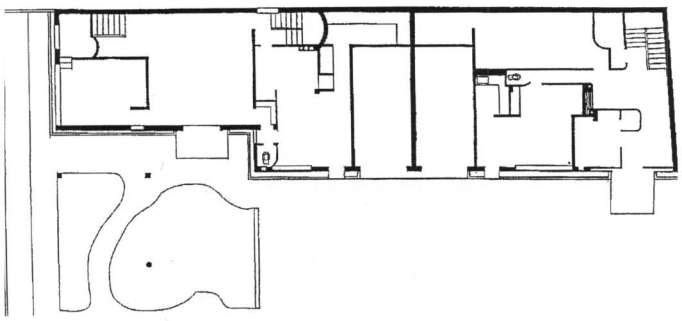
> "The particular curves and slants that once filled the interior and which can still be seen in the roof, manifest the same sensibility as the curvaceous bottles of Le Corbusier's still lifes ..."

Banham (1960b; 1975: 62) shares similar sentiments, judging from his essay "Conclusion: Functionalism and Technology":

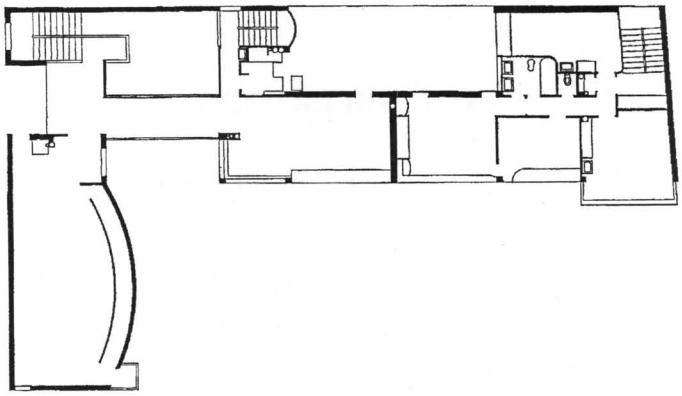
> "[Savoye] raises painterly echoes ... not only are these curves, on plan, like the shapes to be found in his *peintures puristes*, but their modelling, seen in raking sunlight, has the same delicate and insubstantial air as that of the bottles and glasses in his paintings and the effect of theses curved forms, standing on a square slab raised on legs, is nothing so much as a still-life arranged on a table."

There is no doubt that the range of primary forms that dominate in Le Corbusier's purist architecture, as well as in modern architecture in general, serves as the most literal manifestation of Cubism, due to Cézanne's example. In *Age of the Masters* (1962; 1975: 34), Banham concurs:

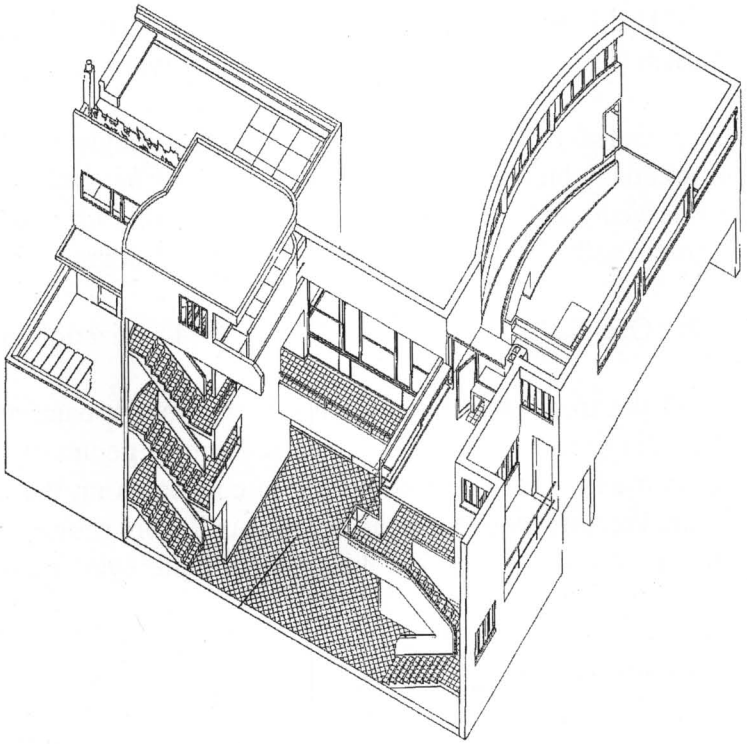
> "From Cubism's wandering emphasis on the regular geometrical solids (canonised by Cézanne as the cylinder, sphere and cone and thus belonging to a tradition that goes back to Plato) come a group of forms, mostly cubic and rectangular, but including also cylinders and half-cylinders (handy for staircases). These forms were realised, where humanly possible, in absolute Platonic purity; cornices, cappings, sills, dripstones were rigourously suppressed, even



First floor plan

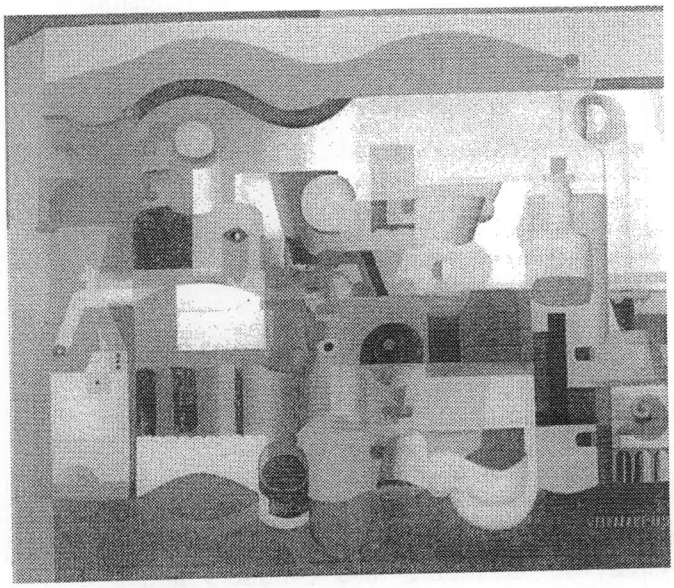


Second floor plan

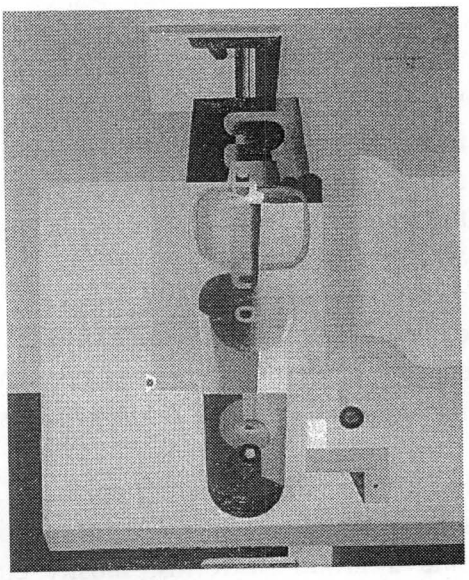


Axonometric

8.22 Maisons La Roche-Jeanneret, Paris (1923).



8.23 *Nature Morte aux Nombreux Objets* (1923).



8.24 *Bouteille et Livre* (1926).

> the facts of the structure were plastered over and rendered smooth to give a homogeneous surface and preserve the uninterrupted purity of the form."

In the first volume of his *Oeuvre Complète* (1929; 1964: 104), Le Corbusier even referred to Maison Cook, Paris (1927, *fig. 8.25*), as *la vriae maison cubique* (the true cubic house) since both its plan and elevations were derived from the same square. In *Vers une Architecture* (1923; 1987: 2, 29), he ceaselessly reiterated the beauty inherent in the cubist formal range, stating that "Primary forms are beautiful because they can be clearly appreciated", adding, "their image is distinct and tangible within us and without ambiguity". Yet, Le Corbusier did compromise the purity of form when it did not conform to the geometry of the site, as happened in the case of *Atelier Ozenfant* where he exploited its angular implications.

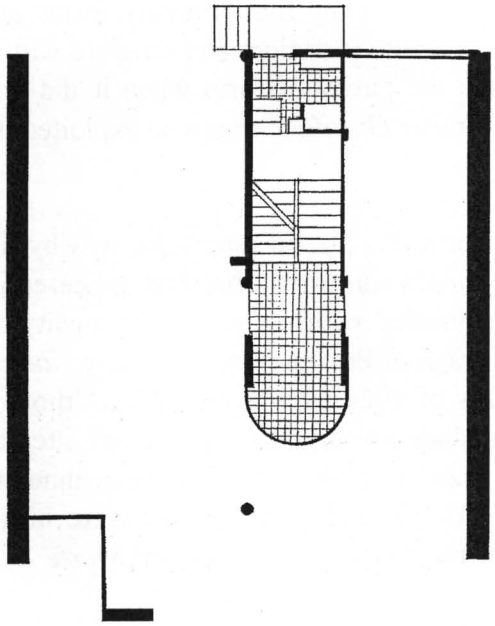
Regardless of the significance Le Corbusier ascribed to pure form, his plastic repertoire was by no means restricted to their exclusive application. The curvilinear shapes and forms that first appeared in his architecture with the design of Atelier Ozenfant in 1923, coincided with the sculptural quality of the axonometric projections investigated during the volumetric stage of Purism – most notably *Nature Morte au Violon Rouge* and *Nature Morte à la Pile d'Assiettes* of 1920 (*figs 8.19-8.21*). Although primary forms dominated in establishing the confines of the building envelopes, the sensuous internal partitions, animated exteriors and evocative roof-scapes epitomized in Maisons La Roche-Jeanneret, Paris (1923), Maison Cook, Villa Stein-de Monzie, Garches (1927), and Villa Savoye were in all probability also derived from the fragmented subject matter of paintings, such as *Nature Morte aux Nombreaux Objets* and *Bouteille et Livre* (*figs 8.22-8.24*).

However, Le Corbusier not only derived a novel range of formal geometries from his painterly abstractions, it also heightened his awareness of the pictorial ambiguities that could bear effect on architectural expression. The aesthetic potential inherent in the contrasting effects of solid versus void, volume versus plane, opacity versus transparency, positive versus negative, light versus shadow, rigid versus animated, regular versus irregular, and so forth, enabled Le Corbusier to extend his plastic repertoire way beyond the formal. The architectural implications of these pictorial sensations were exploited and intentionally manipulated to great emotional effect – endorsing his much-quoted statement from *Vers une Architecture* (1923; 1987: 29) that "Architecture is the mastery, correct and magnificent play of masses brought together in light".

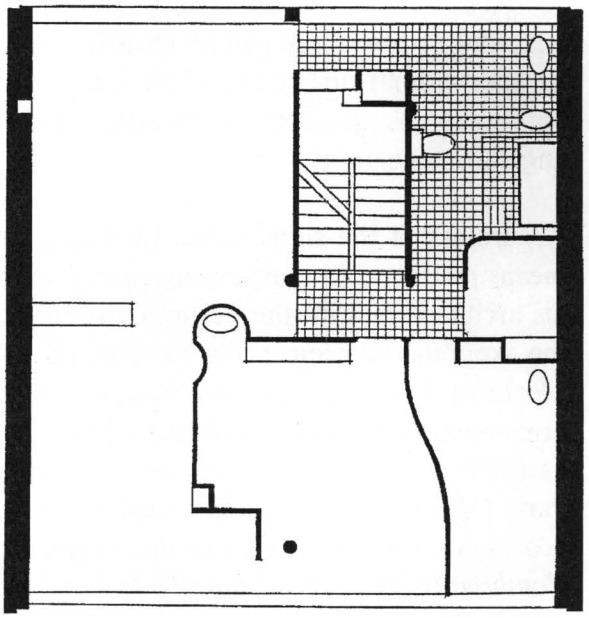
His later purist villas, particularly, Villa Baizeau, Carthage (1929), and Villas Stein-de-Monzie and Savoye, demonstrate his deliberation over the impact of these animated volumes and the intensification of the spatial drama as a result thereof; theatrically contrasted against the rigidity of the Euclidean geometry of the building envelope (*figs 8.26-8.28*).

Close examination of these villas reveals that the plastic potential of his design repertoire were, more often than not, pursued towards their own ends, resulting in contrived planning and the sacrificing of other practical design considerations. These views are corroborated in the comments by another of Le Corbusier's most ardent critics at the time, Walter Behrendt (1937; 1975: 44):

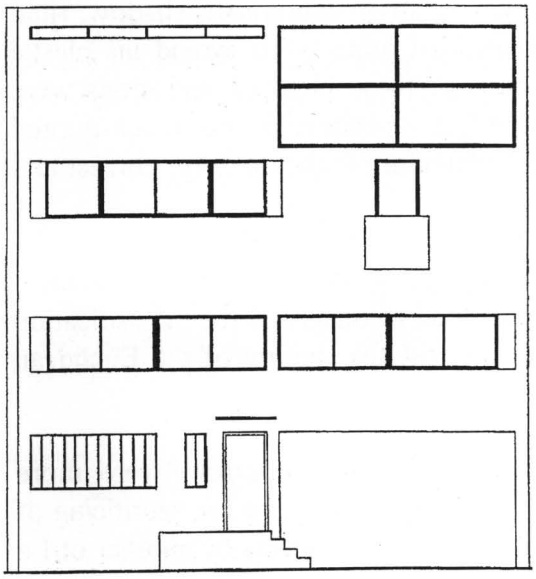
> "In each of his manifestoes, Le Corbusier explains modern building as a problem of functional structure. But to draw conclusions from his practical achievements, he himself seems to be interested not so much in building as a structural problem as in Architecture, which according to his own definition, is supposed to be a 'thing of art, a phenomenon of poetic emotion' ... Le Corbusier ... the Picasso of modern architecture, deals not with the structural problem of building, but with the aesthetic problem of an architectural style."

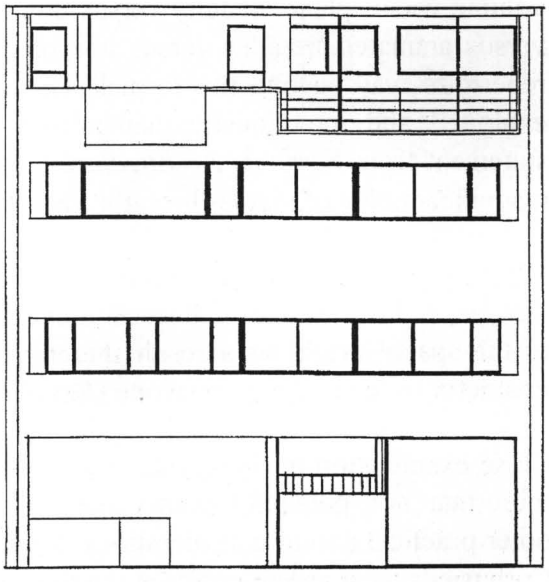


Ground floor plan



First floor plan





8.25 Maison Cook, Paris (1927).

Contrary to his functionalist rhetoric, Le Corbusier stated emphatically in *Vers une Architecture* (1923; 1987: 217-218) that architecture extends beyond utilitarian requirements:

> "The plan of the house, its cubic mass and its surface have been dictated partly by the utilitarian demands of the problem, and partly by imagination, i. e., plastic creation."

The supposed house-machine is beautiful also due to "the animation that the artist's sensibility can add to severe and pure functional elements" (*ibid.*: 7). He added, "So much the worse for those that lack imagination." (*ibid.*: 16) He also differentiated between timeless architectural expression and mere engineering:

> "You employ stone, wood and concrete, and with these materials you build houses and palaces; that is construction. Ingenuity is at work. But suddenly you touch my heart, you do me good, I am happy and I say: 'This is beautiful.' That is Architecture. Art enters in." (*ibid.*: 203)

The aesthetic confidence exuded by his purist villas stemmed undoubtably from the plastic phenomonology that he derived from his painterly pursuits, permitting him to state:

> "Profile and contour are the touchstone of the Architect. Here he reveals himself a artist or mere engineer ... Profile and contour are a pure creation of the mind; they call for the plastic artist." (*ibid.*: 201)

It was ultimately as a result of Le Corbusier's painterly pursuits that he was able to derive a novel formal repertoire that extended way beyond the literal range of cubist geometry. It was as plastic artist that Le Corbusier distinguished himself from his immediate peers; that he became both the most influential and controversial architect of the 20th century, making his architectural contribution unique amongst the protagonists of the Modern Movement. These views fond corroboration in Baker's words (1996: 254) that "the basis of [Le Corbusier's] art was painterly rather than constructional, his source was art ... not technology ..." [Emphasis added by author.]

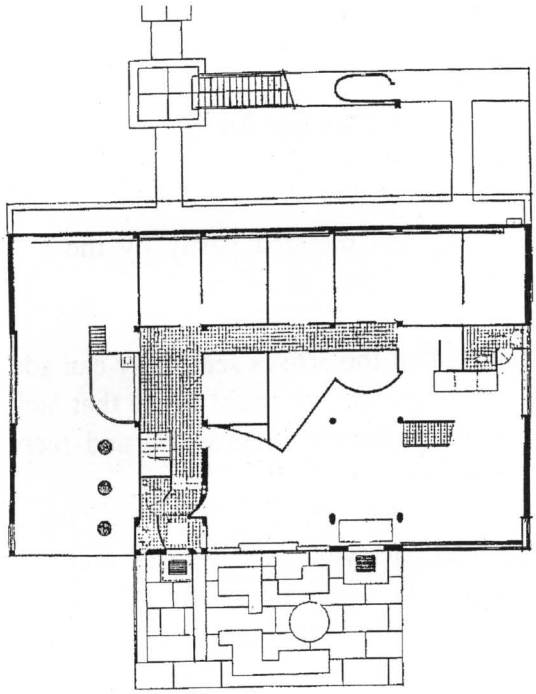
8.8 COMPOSITIONAL CORRELATION

8.8.1 The Regulated Composition

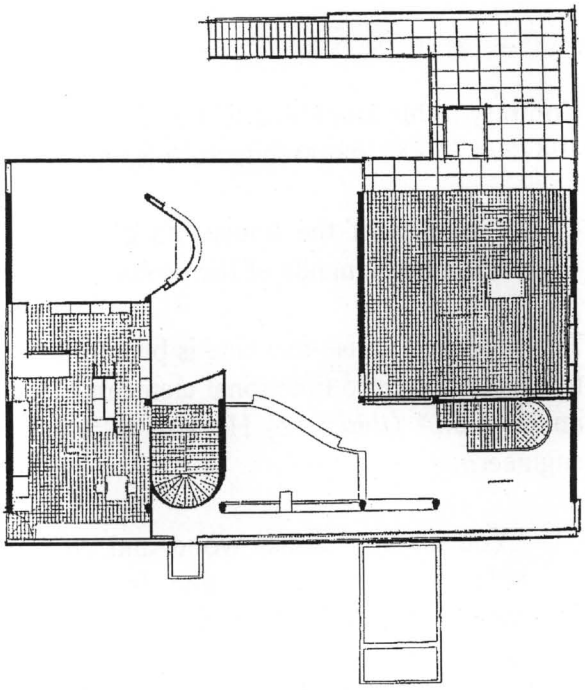
The correspondence between Le Corbusier's painterly and architectural compositions serves as the most literal connection of his approach to these two autonomous disciplines.

It was as a result of the significance ascribed to order, harmony and proportion – indicative of classical architecture and considered in the design of his own buildings since 1911 – that Le Corbusier was able to identify, and counter, the deficiencies of Cubism. The identical algebraic formulae that had initially determined the format and position of the openings on his façades of his buildings governed also the structure of his paintings. These numerological laws – qualified as regulating lines – remained the consistent means with which he organized both the artistic and the architectural compositions (*figs 8.29-8.30*).

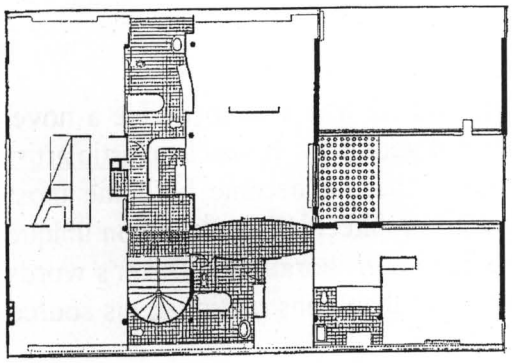
The importance that Le Corbusier attached to the attainment of visual equilibrium finds support in *Vers une Architecture* where he dedicated an entire chapter, entitled "Tracés Régulateurs", to the subject and repeatedly called on the necessity for order. By his own admission, it was this obsession that led to the formulation of his own system of proportion, the Modulor, in 1942. It was also his also



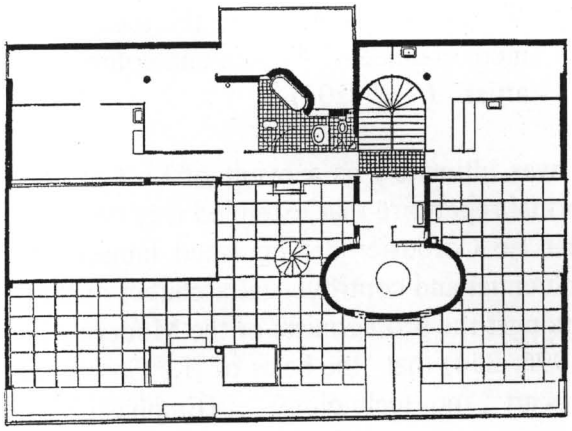
Ground floor plan



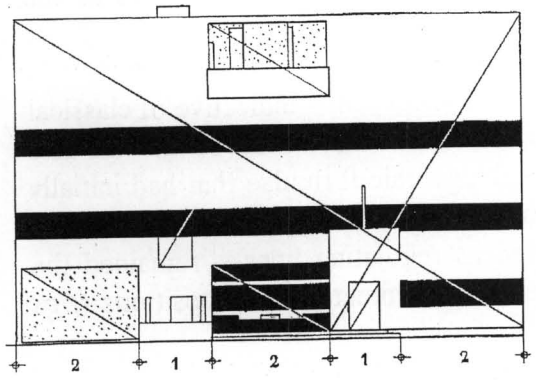
First floor plan

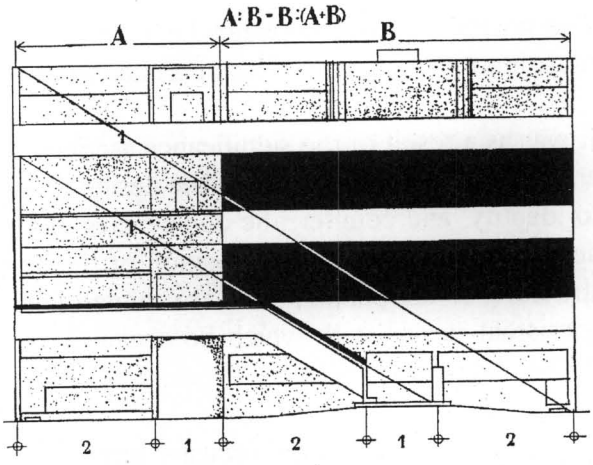


Second floor plan



Third floor plan





8.26 Villa Stein-de Monzie, Garches (1927).

his commitment to the regulated composition that infuriated his critics. Behrendt (1937; 1975: 45), for example, maintained that the regurgitation of "the old and approved expedient of academicism" undermined the conceptual premise of modern architecture, which, in his opinion, had been identified as a pragmatically-determined Functionalism (versus the metaphysically-inspired). In the words of Behrendt (*ibid.*: 45):

> "[Le Corbusier's] work, infused with the spirit of Geometry as the source of its order, certainly affords us the 'sublime satisfactions of Mathematics which gives us such grateful perception of order.' And demonstrating in his achievements this spirit of order, he may convince us as artist, but he cannot convert us to the belief that it is just the spirit of Geometry which determines our modern mode of thinking and affords the universal law under which our time is striving for a new order."

8.8.2 Dom-Ino as Ordering Device

In view of Le Corbusier's preoccupation with the regulated organization of composition, Dom-ino remains his most compelling invention, particularly when considering that it was conceived of four years before the genesis of Purism and thus arrived at independently of any artistic influences. However, in his correspondence with Du Bois (Lowman, 1976: 231), Le Corbusier had already exclaimed as early as 1915 that "Order, rhythm and unity reign in our invention. These are qualities that would take others a mighty long time to find". Despite this statement, it is submitted that at the time of its conception, Dom-ino was intended to act, predominantly, as a structural device with a specific social agenda in mind.

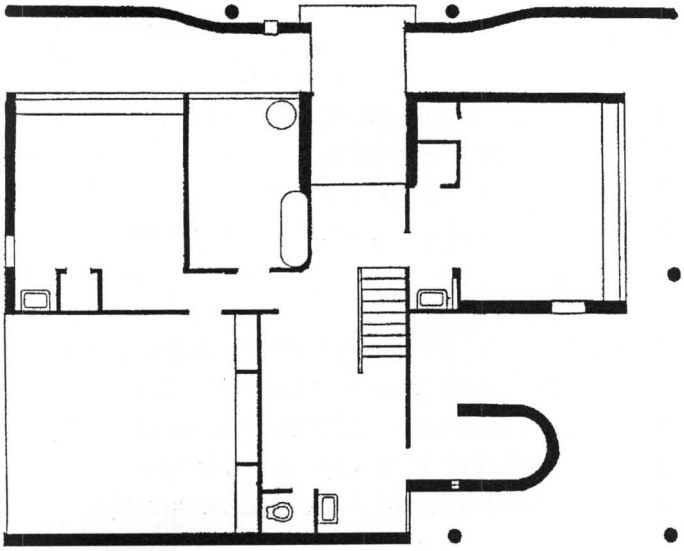
The first demonstration of the application of Dom-ino – the hypothetical housing complex, entitled Maisons Dom-Ino (1915) – serves as a case in point. This project was both a pragmatic response and economical solution to the anticipated post-war housing shortage. With the design of Villa Schwob, the first built example of its application, Dom-ino was regarded solely as the technological means that enabled the architect to combine the load-bearing structure with non-supporting, infill walls. The first universal dwelling prototype, Maison Monol, developed together with Du Bois in 1919, was an extension of previous concerns, with Dom-ino acting as an enabling mechanism for structural, technological and social purposes. The second dwelling prototype, Maison Citrohan, developed one year later, represented a radical architectural metamorphosis, addressing a much wider range of design considerations and anticipating the official codification of the "5 Points d'une Architecture Nouvelle" in 1925/6. It is significant, although not surprising, that Maison Citrohan was selected as the typological model of the purist villas excecuted during the 1920s and not Maison Monol.

It is proposed that it was as a result of his painterly investigations that the latent implications of Dom-ino were finally recognized, argued as follows:

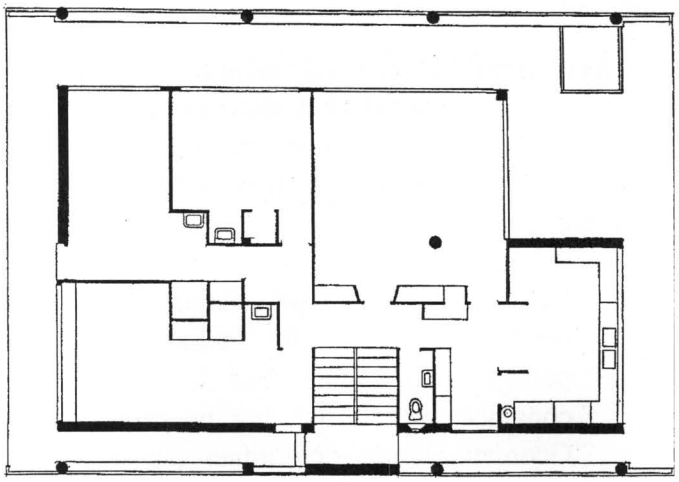
1. The reverence for order enabled the Purists to develop an alternative theoretical argument and corresponding design strategy to counter the lack of order in cubist painting.

2. At the time that the Purists "called for order" (*rappel à l'ordre*) in the painterly composition Le Corbusier had already, and independently, discovered the tectonic means with which – in addition to regulating lines – order could be attained in the architectural composition.

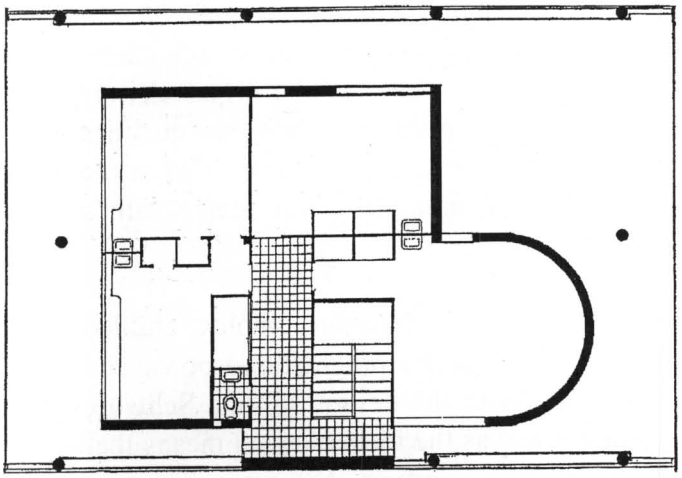
3. The purported compositional deficiencies of Cubism reaffirmed the necessity for order, and called attention to the correspondence between the artistic and architectural composition.



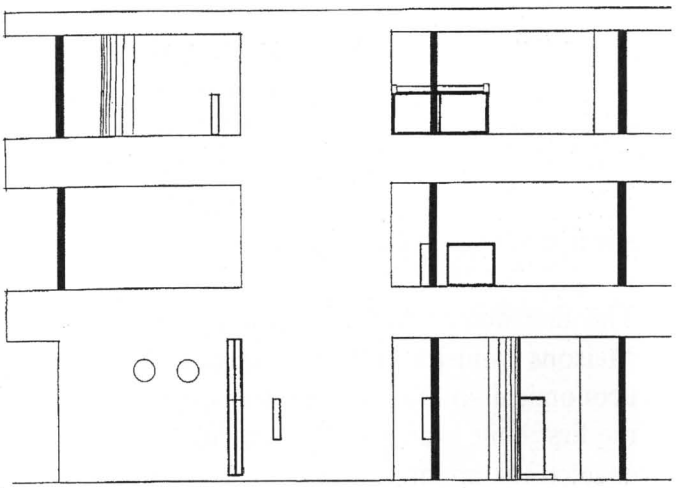
Ground floor plan

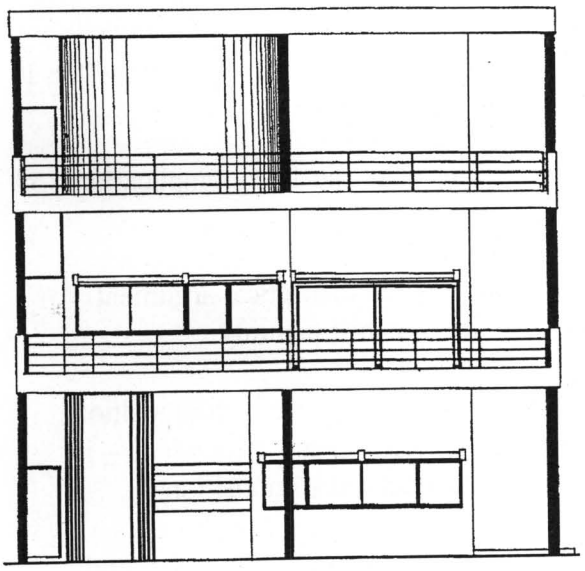


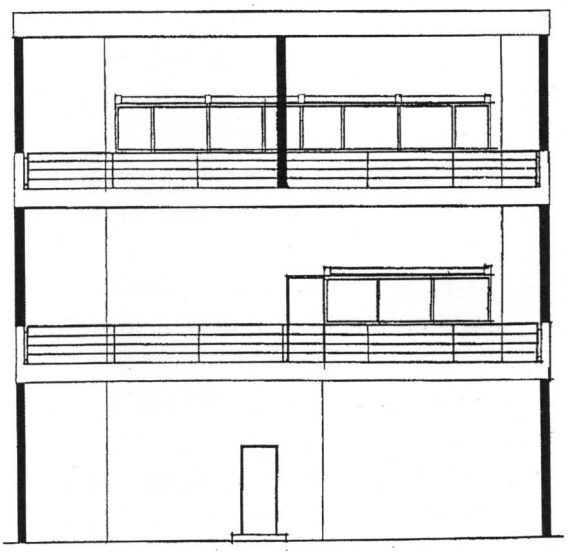
First floor plan



Second floor plan







8.27 Villa Baizeau, Cathage (1929).

The organizational – or structural – discipline sought in cubist composition, and consequently demonstrated in the countering purist compositions, coincided with the regulated system of order that the Dom-ino structure imposes on the architectural composition. It was only once the symbiotic relationship between the artistic and architectural composition was established, that the actual mental connection was made that Dom-ino serves as an ordering device (in addition to being a structural system). Admittedly, Le Corbusier had earlier exclaimed that order reigned in their invention, but he did not, until after the genesis of Purism, comprehend and internalize the implications of his own statement. Dom-ino certainly regulates the distribution of the structural load dictated by pragmatic requirement, but it determines and controls also the visual organization of the building – both in footprint and in silhouette. It was only once Dom-ino was recognized as a compositional mechanism – a "rule structure" according to Plattus (1987: 17) – that the subliminal conceptual, plastic and spatial potential on offer, finally dawned on Le Corbusier. In the words of Plattus (*ibid.*):

> "He then proceeded, over the following decade, to extrapolate from the hypothesis of the Dom-ino not only a set of house types that challenged as they transformed the received domestic repertoire, but also and even more importantly, he formulated the basic rule structure of an architectural language predicated upon both modern construction and the revolutionary experiments of cubist paintings."

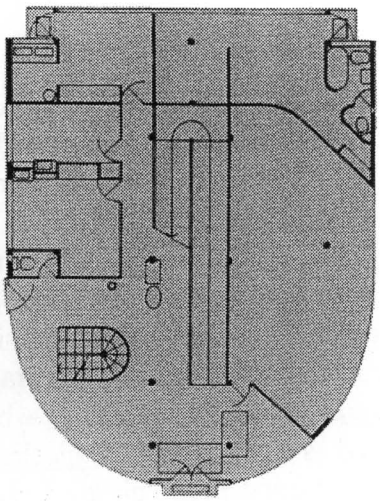
Since the Purists maintained that cubist paintings were unsubstantiated by any rational means of compositional organization, their artistic pursuit was entirely dominated by the quest for order. It is ironic, but highly significant, that by restraining the creative freedom generated by the spatial and pictorial innovations of Cubism Le Corbusier could finally indulge in the advantages of his own structural invention. Paraphrased: once the rational organization of the architectural composition had been recognized as a result of the countering purist paintings, the creative possibilities engendered by Dom-ino could ultimately be taken advantage of.

Dom-ino induced, foremost, a structural freedom that liberated both interior and exterior from previous load-bearing constraints. This liberation, combined with the inherent characteristics of reinforced concrete, found due expression in the *piloti*, *plan libre*, *façades libre*, *fenêtres en longeur*, and *jardin suspendu* – the distinguishing features of a new, modern architecture. The skeletal structure, moreover, enabled a novel aspectival expression of space that could be contained, extended, intensified, manipulated and modulated at will. Finally, Dom-ino permitted endless architectural variety, which, combined with the plastic phenomenology derived from painterly experimentation, could be explored to the creative heart's content.

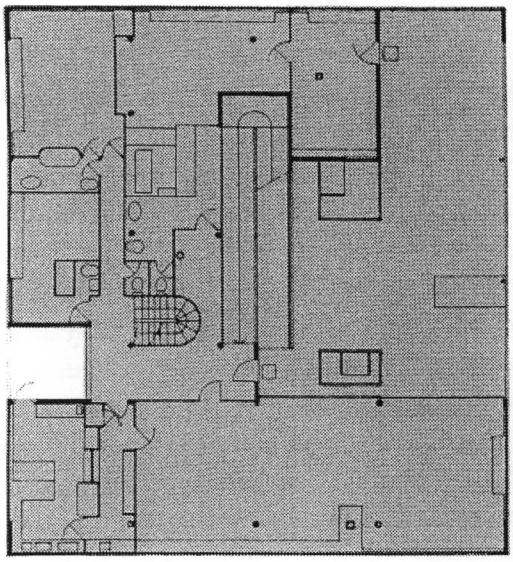
Thus, Dom-ino can be regarded conclusively as an ordering device. As a regulating system, Dom-ino fulfils the same function as regulating lines since it controls the distribution of the respective architectural entities, which, in this instance, happen to be structural components. Just as the regulating lines served as the agent for the algebraic formulae corresponding to the ratios of the Golden Section, so does Dom-ino with all its interrelated dimensions – the column intervals, floor to ceiling height, and column and slab thicknesses [13] – adjusted according to mathematical conventions. An analogy between Dom-ino and the Parthenon – "a product of selection based on a standard" , "animated by a unity of mathematical intention" (Le Corbusier, 1923; 1987: 131, 213) – or equating Dom-ino, as ordering device, with the Greek Orders, is not as farfetched as Le Corbusier would have.

---

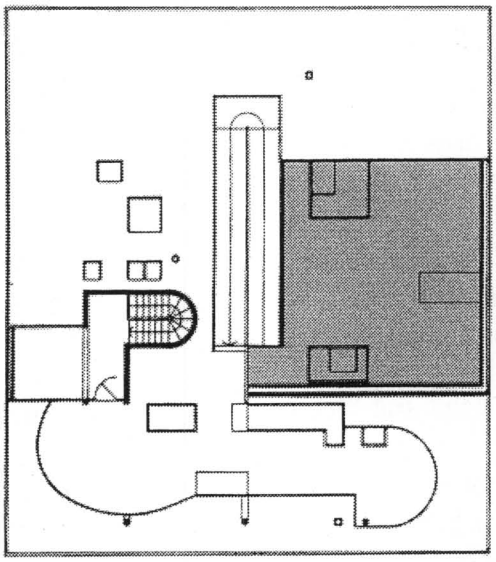
13 It is mere speculation that the initial dimensions of the columns and floor slabs corresponded to the algebraic figures of the Golden Section. However, it is a fact that with the advent of the Modulor, all dimensions were modified accordingly. See Collins, P., 1954, "Modulor", reprinted in Serenyi (ed.), 1975, *Le Corbusier in Perspective*: 79-83, for an account of the difficulties these obscure dimensions caused contractors and engineers.



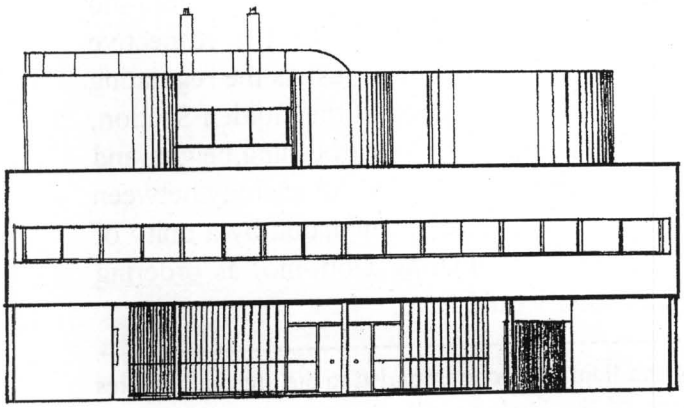
Ground floor plan

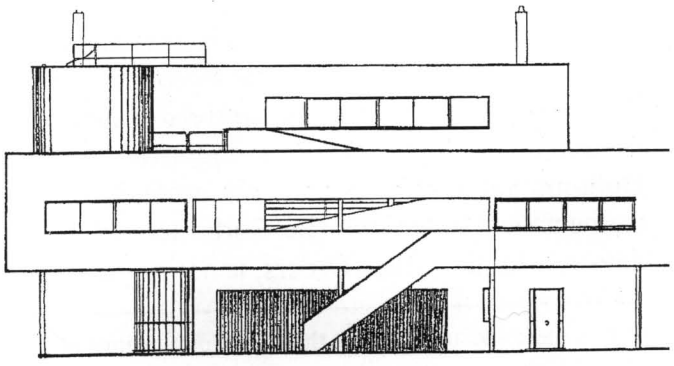


First floor plan



Second floor plan





8.28 Villa Savoye, Poissy (1931).

8.8.3 The Generating Surface

As the primary compositional determinant, Dom-ino manifested as the "geometric substructure" – as referred to by Colin Rowe (1947; 1975: 53) – of a prospective building which had been predetermined by load-bearing efficiencies. As a result, a regulated system of (structural) order had, in advance, been imposed on the respective floor plans – the figure-ground – and its corresponding façades – the 'elevational' surfaces. Following this train of thought, it is not too outrageous to equate the confines of the imposed footprint and silhouette of Dom-ino with the painterly canvas, inviting the distribution of the architectural subject matter. Its demarcation was partly determined by utilitarian considerations – programme, ergonomics, circulation, and so forth – and partly by so-called plastic creation, though in all instances verified by the *tracés régulateurs* – "the means of verification which can ratify all work created in a fervour" (Le Corbusier, 1923; 1987: 75), though, now the secondary means of compositional regulation. These assumptions find corroboration in Le Corbusier's own words in *Vers une Architecture* (*ibid.*: 217-218):

> "The plan of the house, its cubic mass and its surface have been dictated partly by the utilitarian demands of the problem, and partly by imagination, i. e., plastic creation. Here at once, in regard to the plan and consequently in regard to whatever is erected in space, the architect has worked plastically; he has restrained utilitarian demands in deference to the plastic aim he was pursuing; he has made a composition [*sic*]."

Naegele (1995: 115, footnote 33) draws attention to the consideration Le Corbusier gave to the format of the canvas, supporting the suggested analogy between the Dom-ino cartouche and the painterly surface:

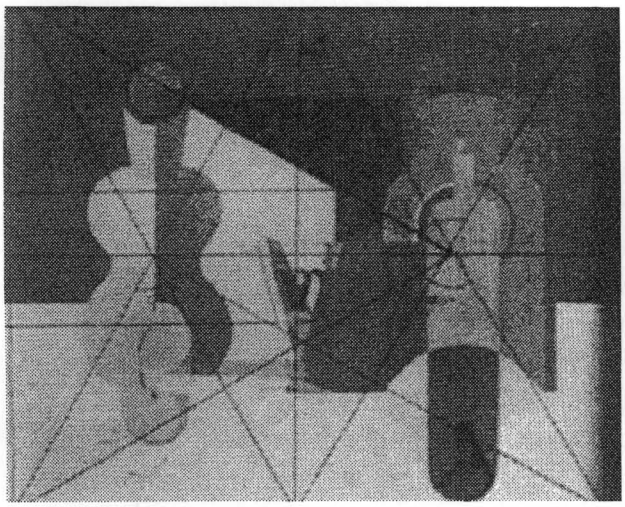
> "The proportions of the canvas itself played a critical role in Purist painting, for it generated the regulating lines which governed the placement of each element pictured, establishing the desired 'resonance' of the part to the whole. So precisely calculated was this that Le Corbusier found it necessary to devise a special picture frame for his paintings since a typical picture frame – which covered an inch or more of the canvas periphery – defused the picture by altering its proportions."

It is not surprising that Le Corbusier would identify mass, surface and plan – in that sequence – as the so-called three reminders to architects in the introductory pages of *Vers une Architecture*. Mass, surface and plan, together with the regulating line, not only encompassed Le Corbusier's design methodology but also reinforced the correlation between the artistic and architectural compositions. Le Corbusier (1923; 1987: 75) stated that it is the task of the architect, as plastic artist, to "vitalize the surface".

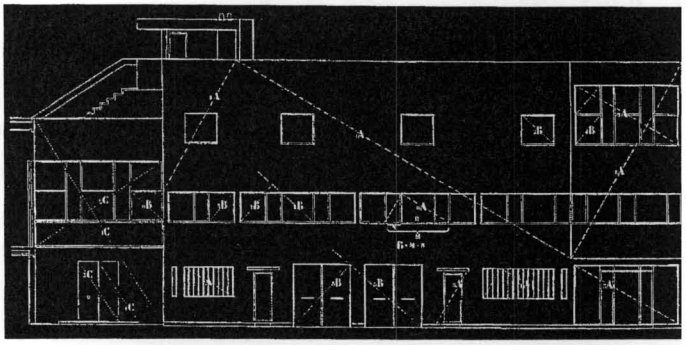
For Le Corbusier (*ibid.*: 35), surface was the envelope of mass. Consequently, the distinction between plan and elevation is irrelevant since both qualify as compositional surfaces, and the identical design strategy is applicable to the manner of distributing the architectural content. This view is substantiated by Rowe's lesser known essay "The Provocative Façade" (1987), which was derived from Le Corbusier's ambiguous statement in *Vers une Architecture* (*ibid.*: 168) that "the floor is really a horizontal wall".

The following quotation served as the premise for Rowe's theory:

> "If walls become floors, then sections become plans; and as the building becomes a die to be thrown on the table, then all the rest results. We throw around the die: and, as façade becomes side elevation, as Dom-Ino becomes Citrohan, a continuous twisting of meaning and presentation is obliged to occur." (Coll, 1996: 11)

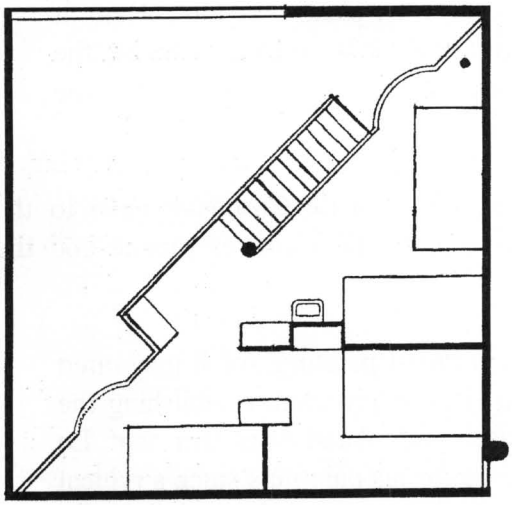


8.29 *La Bouteille de Vin Orange* (1922).



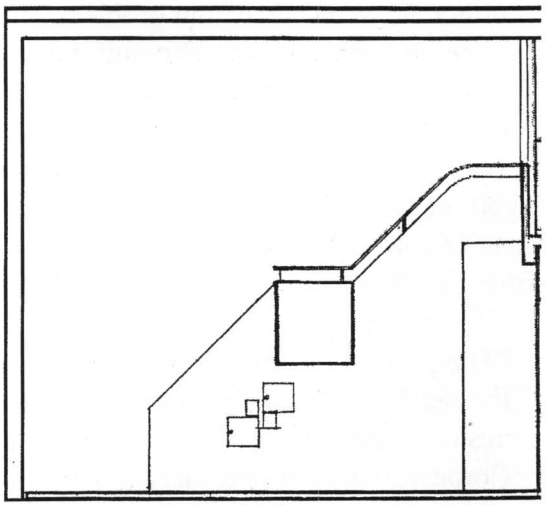
Elevation

8.30 Maisons La Roche-Jeanneret, Paris (1923).



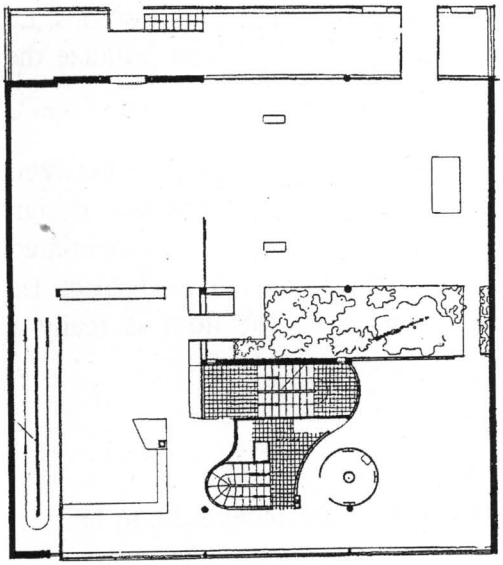
Plan

8.31 Mass-Produced Artison's Dwelling, project (1924).

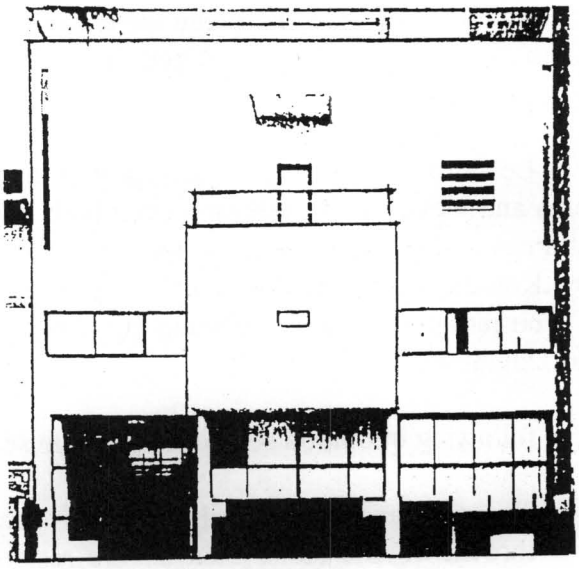


Section

8.32 Villa Ternisien, Boulogne-sur-Seine (1925).



Plan



Elevation

Although Rowe only cites Dom-ino and Maison Citrohan, his hypothesis gains credibility when one compares the first floor plan of the Mass-produced Artisans' Dwelling (project, 1924, *fig. 8.31*) with the section of Maison Ternisien, Boulogne-sur-Seine (1926, *fig. 8.32*); or a floor plan of Villa Meyer (project, 1925, *fig. 33*) with an elevation of Maison Cook or Maison Plainex, Paris (1928, *fig. 8.34*).

Incidentally, the die features consistently in Le Corbusier's paintings, which could well be the key in support of Rowe's theory. During his research of Le Corbusier's paintings dating from his post-purist period, Coll realized that it might be more feasible to analyze the rationale of his painterly actions than to try and decipher its complex surreal narrative. Coll (1996: 4-5) states:

> "Rather than studying Le Corbusier's work as a series of autonomous objects why not consider it as a field of interactions where he himself introduces the idea of 'play'."

The notion of play corresponds with Rowe's 'rotating hypothesis' and finds corroboration in a letter to a curator at the Tate Gallery, one Ronald Alley, in 1958, in which Le Corbusier made the following remark:

> "You will see how things come about: from a vertical painting of 1920 ... thirty years later ... a series of deformations ensued." (*ibid*: 5)

Although Le Corbusier hardly ever wrote about any of his paintings, this comment may, according to Coll (*ibid.*), be the cue to understanding Le Corbusier's multi-faceted design methodology. Coll suggests that if these compositional transformations were a known method applied to his paintings, particularly to his later work, it might have applied to his architecture as well – assumptions that contradicts Le Corbusier's dictum of the plan being the exclusive generator of his designs.

When one examines *Vers une Architecture* from an interdisciplinary point of view, the artistic connection, although subliminal, becomes far more apparent. However, Le Corbusier's rhetorical statements such as "the plan is the generator", "the plan proceeds from within to without", "the house is a machine", "the floor is a wall", and so forth, were more often than not misappropriated without the artistic connection.

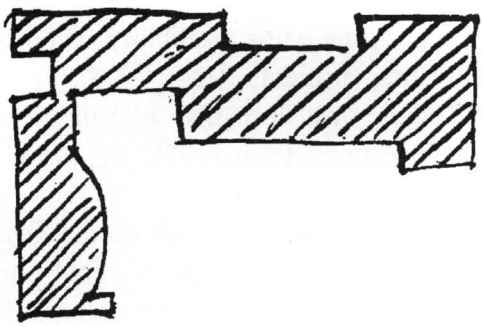
8.8.4 "Four Compositions"

The importance Le Corbusier ascribed to composition is evidenced by the terminology he chose to describe his four seminal purist villas (*fig. 8.35*). [14] The so-called Four Compositions, [15] including Maisons La Roche-Jeanneret, Villa Stein-de Monzie, Villa Baizeau and Villa Savoye, demonstrated the principal categories of formal configuration and spatial organization that were derived from the varied application of Dom-ino. On the authority of to Guiton (1981: 49), Le Corbusier remarked as follows during an unspecified lecture:

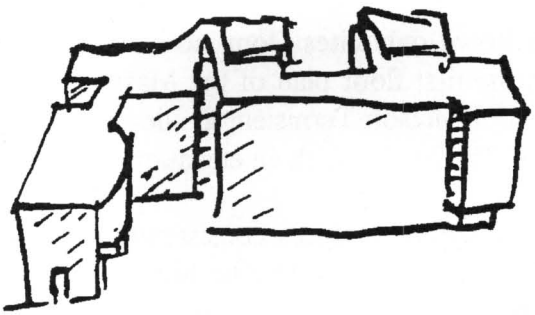
---

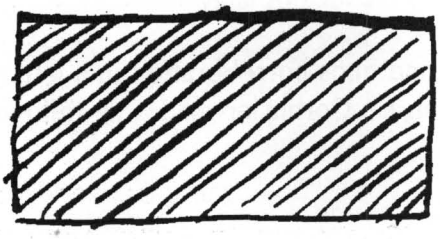
14 The denotation *Les Quatre Compositions* presumably first appeared in print with the publication of the first volume of Le Corbusier's *Oeuvre Complète* in 1929.

15 There is confusion about the identity of the Third Composition. In Le Corbusier and Jeanneret, P., 1929; 1964, *The Complete Architectural Works, Vol. 1, 1920-1929*, trans. Boesiger, W. (London: Thames & Hudson), 189, it is qualified as the single family dwelling unit designed for the Weissenhofsiedlung. Instead, its appearance resembles Villa Baizeau. In a compilation of Le Corbusier's writings and lectures by Guiton, J., (ed.), 1981, *The Ideas of Le Corbusier on Architecture and Urban Planning* (New York: Braziller), 49-51, an extract from an unspecified lecture given in 1930 refers to the four formal prototypes that reflected the architect's principal design points of departure of the 1920s. The illustrations and accompanying description identifies Villa Baizeau as the third example, and reads as follows: "The third type ... is an ingenious type, particularly appropriate to certain climates." It is not unlikely that the initial reference may have been a printing error.

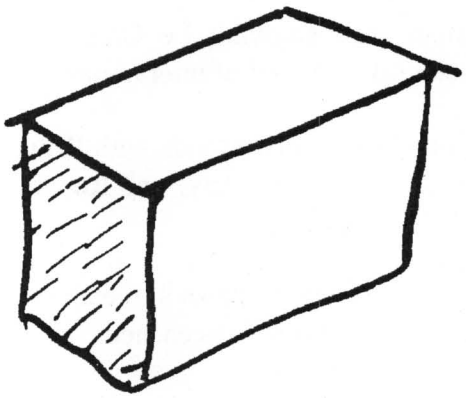


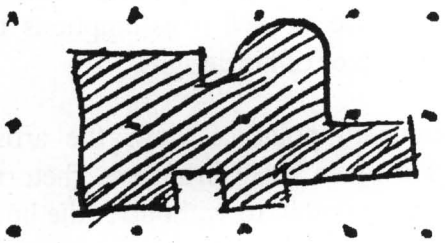
1.



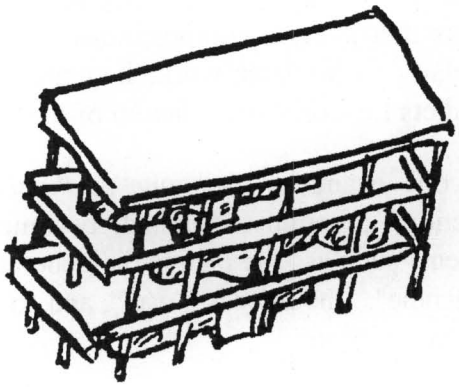


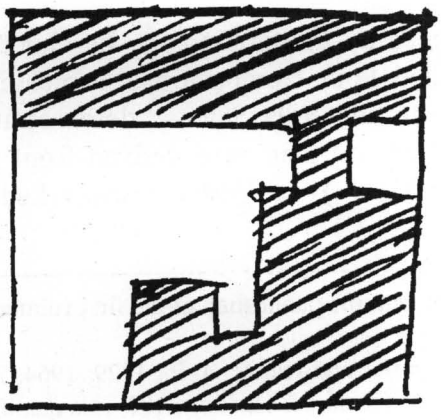
2.



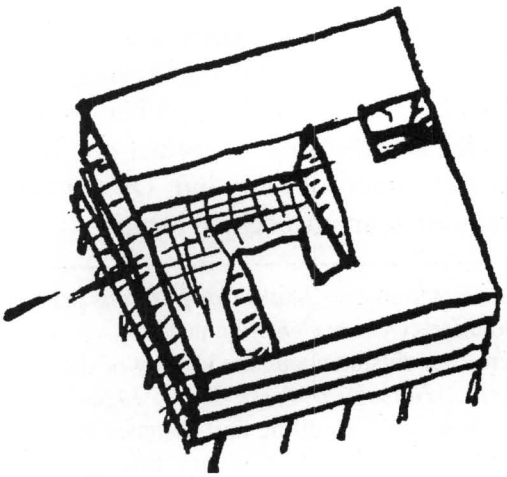


3.





4.



8.35 Four Compositions:

1. Maisons La Roche-Jeanneret 2. Stein-de-Monzie
3. Villa Baizeau 4. Villa Savoye.

"Using consistent methods, regarding priorities, dimensions, flow of traffic, layout, and proportions, we have thus far used four distinct types of plan, each corresponding to a particular intellectual purpose."

These "intellectual purposes" most probably referred to site constraints (Maisons La Roche-Jeanneret), programmatic requirements (Villas Stein-de Monzie and Savoye) and climatic conditions (Villa Baizeau), which each necessitated a particular design response.

Although the structure of the earliest example, Maisons La Roche-Jeanneret, consisted of a combination of two juxtaposed Dom-ino structures, its physical appearance was not restricted by either. Le Corbusier's description of this villa as "picturesque and full of movement but requiring classical hierarchy to discipline it" (Gans, 1987: 44), refers explicitly to Dom-ino as the underlying compositional substructure. Villa Stein-de Monzie is an extension of the former project except that its volumetric animations were confined by the Dom-ino envelope, which, according to Le Corbusier on Guiton's authority (1981:50), acted as "a self-imposed limitation" and challenged the architect's "creative and intellectual energies". Due to the extreme climatic conditions of Tunis, Villa Baizeau materialized as a further interpretation of Dom-ino in that the internal structural framework was externally exposed. Lastly, Villa Savoye, is a combination of all three above-mentioned Dom-ino derivatives.

The terminology "Four Compositions" refers not only to the ciphered organization of the different façades, but also to the respective floor plans, which, individually, read as graphic compositions or abstract paintings. In addition, the Dom-ino cartouche – just like the subject matter of purist paintings – demonstrated that a limited architectural arsenal could provide endless compositional variety.

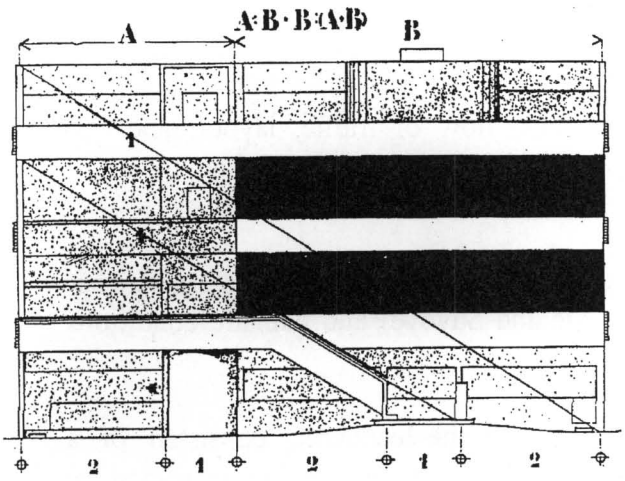
8.8.5 The Classical Connection

Due to the emphasis on aesthetic formulae of historical origin, Le Corbusier's purist architecture is often described as a classical Modernism. Behrendt, a protagonist of Wright, was adamant that Le Corbusier's work was revolutionary but not new, whereas Wright's work was truly original but not revolutionary (Serenyi, 1975: 5). Behrendt's views found support in Rowe's renowned essay "The Mathematics of the Ideal Villa: Le Corbusier and Palladio Compared" (1947; 1975: 46-55), with his comparisons between Villas Stein-de Monzie and Savoye and the 16th century Villa Foscari, Malcontenta (1563) and Villa Capra (La Rotonda), Vicenza (1569) by Antonio Palladio (1508-1580).

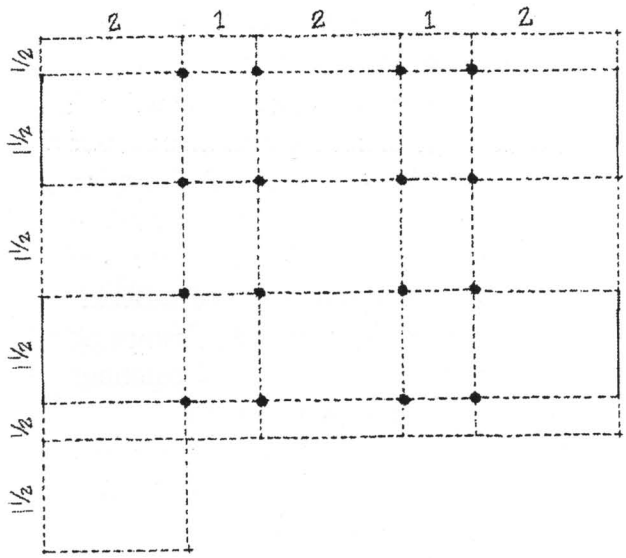
The classical overtones of Villa Stein-de Monzie, considered by James Stirling (1955; 1975: 58) as "the masterpiece of Neo-Palladionism in modern architecture", were, contrary to Villa Besnus, [16] a response to the client's request for a contemporary equivalent of an Italian Renaissance villa. As Rowe has demonstrated, the compositional organization of the plans and elevations of Villa Stein-de Monzie are almost identical to Villa Foscari – sharing also the algebraic relationships of the Golden Section (*fig. 8.36*). Rowe (1947; 1975: 53) admitted, though, that the mathematical correspondence between Villas Savoye and Capra is far less apparent but for certain symbolical similarities, which, he maintained, constitute the essence of these two archetypal Platonic villas in the history of architecture.

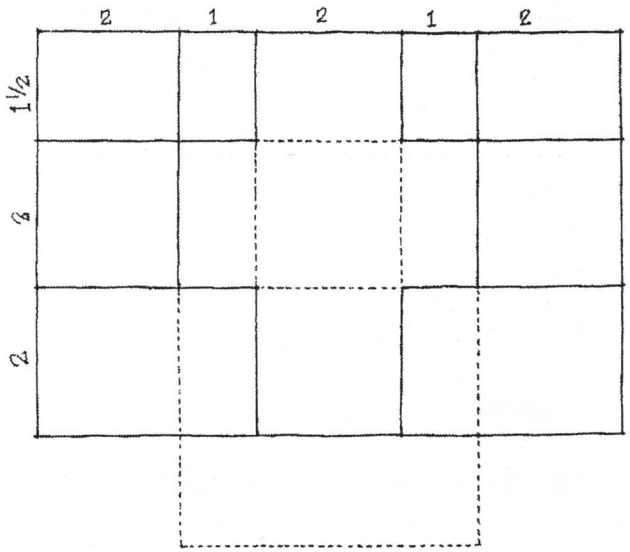
---

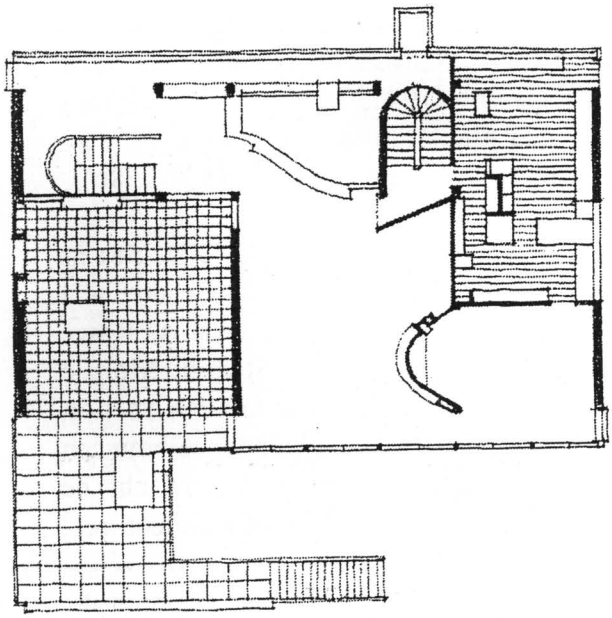
16 The client, Besnus, had requested an adaptation of Maison Citrohan after having seen its model on display at the Salon d'Automne in Paris in 1922. Instead, Le Corbusier chose Le Petit Trianon, Versailles (1769), designed by Jaques-Ange Gabriel for Louis XV, as source of reference. Although its spatial organization and planning was distinctly modern, Villa Besnus demonstrated the validity of underlying classical aesthetic principles in the ordering of the façades.

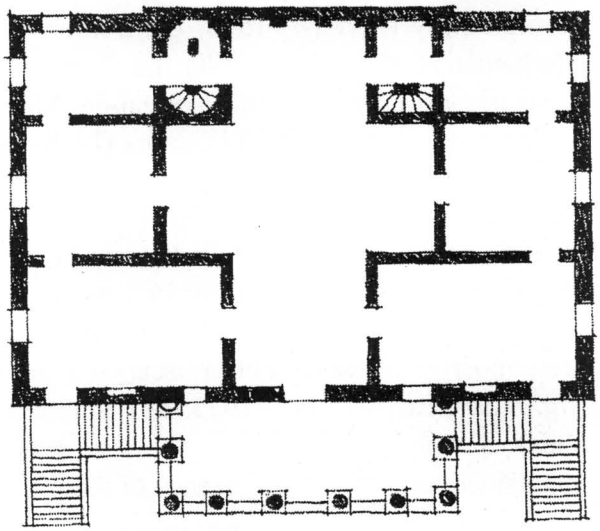












8.36 Comparison of Le Corbusier, Villa Stein-de-Monzie, Garches (1927) and Palladio, Villa Foscari, Malcontenta (1563).

As tempting as historical analogies may be, the complexity of the two Corbusian villas transcends oversimplification. And whilst their exteriors project a customary, classical restraint – reinforced by the uninterrupted *fenêtres en longeur* that neither allude nor conform to the functions behind – their interiors exude a formal modulation and spatial intensity, which Gans (1987: 61) attributes entirely to Cubism:

> "This continuous layering of space is consonant with the compositional devices of overlapping planes, shifting of figure and ground, and deconstruction employed in Synthetic Cubism's pictorial space. For example, the façades are organised as a series of overlapping planes, some real others implied, that recede or emerge in relation to the reference plane of the white wall ... They draw emphasis to the extreme periphery of the façade much as in the centripetal compositions of cubist paintings.

Rather, the brilliance of both Villas Stein-de Monzie and Savoye exists in the manner in which the classical and modern are synthesized, creating numerous interpretations and ambiguous readings. These dualities are testimony the architect's uncanny ability to manipulate and abstract – if not 'modernize' – historical compositional devices. Since transcendental, compositional principles had fallen into disfavour, Le Corbusier proved it was possible to re-assert an aesthetic objectification which the metaphysically-inspired, mathematical conventions afforded him. As proportion, order and visual harmony brought him "comforting truths", Le Corbusier maintained that "one only stops his work with the certainty of having reached the precise result" (Rowe, 1947; 1975: 51). It was indeed these precise results, imbued with the creative exuberance derived from his painterly experiments, that secured Le Corbusier's position as the most accomplished architect of this century. In the words of Stirling (1955; 1975: 58):

> "Garches [and Savoye], built at the culmination of Cubism and canonizing the theories in *Towards a New Architecture*, has since its inception been the standard by which Le Corbusier's genius is measured against that of other great architects of this century."

8.9 SPATIAL AMPLIFICATION

8.9.1 The Cubist Legacy Extended

As outlined in the preceding chapters, the revolutionary space-time dimension and the resultant formal permutations introduced by Cubism heralded incalculable consequences for the entire spectrum of the plastic arts.

Foremost, the violation of the customary pictorial procedures to create an illusion of depth radically altered the artist's attitude to the subject matter; the relationship of one object to another; and changed, finally, the rapport between the object and the painterly surface. The latter, in turn, gave rise to the self-referential relationship of the object that prompted its dematerialized condition from form to shape. The acceptance of the canvas as a two-dimensional surface manifested in the consideration to composition, but, more importantly, the act of distribution became a novel field of exploration: whether distributing the painterly content for semiotic purposes, as pursued by the Cubists; or whether investigating the sensory implications of the juxtaposed relationships of the dematerialized subject matter, as were furthered by the Orphists, Neo-Plasticists, Suprematists, and so forth – endeavours that collectively qualify as abstract art.

As this study indicated, Purism focussed, specifically, on the rationalization of this act of painterly distribution, resuscitating classical organizational conventions in order to do so. It is without a doubt the Cubists' acknowledgement of the canvas as a two-dimensional entity that instilled Le Corbusier's preoccupation with the architectural surface and its "vitalization"; treating it – whether plan or elevation – as a graphic composition, as if an abstract painting.

Picasso's extraordinary decision to depict different views of the same object simultaneously served as the most explicit violation of visual observation. The implications of this particular act were manifold:

1. It demonstrated the relative position that the observer occupies in time and space – not only from an optical point of view in relation to the observed artefact, but also from a philosophical point of view.

2. The synthesis of multiple vantage points into a single optical experience implied that the authoritative vantage point of perspective could be challenged, and was no longer the exclusive means by which to convey – or experience – visual observation.

3. Due to the cognitive perception of both time – the quantitative duration to move, in an imaginary sense, from one point of observation to another – and space – the physical terrain that had been covered in order to do so – time and space were recognized as viable artistic concepts.

4. The induced space-time dimension stimulated an awareness of space as a plastic phenomenon that could, moreover, be explored independently from any formal container.

Picasso's investigations into the depiction of pictorial depth without retort to perspective led to an unprecedented preoccupation with space *per se*. On the one hand, the eschewal of pictorial depth, implied space and even the two-dimensional spatial vacuum that was created, spawned the aforementioned artistic initiatives that were pursued towards their own pictorial ends. On the other hand, Picasso's example initiated an awareness of space that was, for the first time, explored towards plastic ends.

8.9.2 The Architectural Assimilation of Space

The novel spatial concept was swiftly absorbed by sculptors who abandoned their past preoccupations with mass to explore, instead, the evocative possibilities of space. The spatial phenomenon was also assimilated architecturally. Both authors, Maurice Besset and Banham, give, independently, a post-rationalized account of how this assimilation had occurred.

Firstly, the space-time dimension of cubist painting induced a virtual mobility – an imaginary sense of movement through space and in time. This notion of movement was promptly transformed architecturally, paradoxically, in order to be physically experienced. According to Besset (1968: 40):

> "Transposed to the plane of practicable space of architecture, this new mobility made it possible to break with the classic system of static, purely visual arrangements, composed in terms of axes and symmetries, and to endeauvour to reintegrate within architecture the sum total of complex experience of movement."

Secondly, the negation of perspective introduced a dramatic shift in the cogno-perception of space and, consequently, in the architectural expression of plastic space. Not only did the past use of perspective reinforce visual observation – both artistically and architecturally – it also endorsed the organization of architectural components according to the classical principles of symmetry and axes, and encouraged deliberated optical adjustments. Since the pictorial arts had indicated that perspective could indeed be challenged, the customary perspectival sense of space that had previously been observed from an authoritative or static vantage point, was transcended by an aspectival or experiential sense of space. This implied that an architectural space could be experienced from a multitude of different vantage points, responding to the novel pictorial concepts of simultaneity, space-time and suggestions of motion.

In the words of Banham from the *Age of the Masters* (1962; 1975: 51):

> "... the space of modern architecture is conceived as having a very special relationship to the observer: either he, or it, is in motion (in an age that thinks much about relativity, it doesn't matter much which moves) ... the interior spaces of a building are to be experienced as a series of partitions of infinite space by an observer moving through them on a prescribed route ... indicated by stairs, platforms, ramps even the pattern or texture of the floor, which guide him through a series of spatial manoeuvres."

Thirdly, the suggestion of depth that resulted from the juxtaposing of different objects in cubist painting amplified the notion of transparency – an aspect that found a literal counterpoint in architecture. Even though transparency in building had been actively investigated since the mid-19th century, the cubist explorations contributed considerably to the awareness of the plastic potential of transparency. This realization, combined with the sudden spatial revelation, led to a premeditated integration of the inside and the outside, and the conscious extension of space. According to Banham (*ibid.*: 56):

> "... the masters of the twenties introduced the idea of the interpenetration of inner and outer space, house and garden. Space in this sense flows almost tidally, away from the observer – when he is outside the house, space flows in, when he is within, space flows out into the garden."

Fourthly, the extensive use of glass in modern building construction also contributed to both the expression and observation of space. The deliberate modulation of the interior, the casting of shadows and even electrification could conspire to the external reading of a particular space. Authors Rowe and Robert Slutzky (1963: 45-54) distinguish between a literal and a phenomenal transparency in architecture, which they relate to cubist painting. The former dominates in the work of the Bauhaus contingents – most notably, Walter Gropius (1883-1969) and the visionary glass skyscrapers of 1920-1921 designed by Mies van der Rohe (1886/8-1969) – in which "literal transparency becomes physical fact". These examples are, though, devoid of any ambiguous spatial readings – qualities that are so distinctly apparent in Le Corbusier's purist architecture and, therefore, exemplary of a phenomenal transparency.

Lastly, the Cubists' preoccupation with space found recondite expression in architecture – least of all due to the fact that painting can only imply or allude to the third dimension, whereas architecture is the three-dimensional manifestation of manipulated space. As Banham (1962; 1975: 5) observes, the notion of architectural space as an *a priori* concept – conceived of independently from any formal container – is a phenomenon exclusive to this century:

> "The one thing that is undeniably new about modern architecture is the conscious manipulations of space. We talk loosely about Baroque space and Gothic space and argue about whether the Greeks ever had any sense of space at all ... For an architect to think of himself as using or working in space is purely twentieth century ... the space in which the modern architect consciously works is unlike the space, conscious or otherwise, of any previous architecture."

In the article entitled "Constructivism" (1941: 245), Rex Matienssen, the authority on the Greek conception of space, concurs:

> "From the earlier confusion of volume as an adjunct to conglomerate construction there emerged a new conception of the fundamentals of architecture, of defined and 'pure' space as an end in itself and not as a by-product."

This spatial cognition spawned a host of different interpretations and a plethora of practical investigations that were independently pursued by the Purists, Neo-Plasticists, Soviet avant-garde, Futurists, Bauhaus proponents, and so forth.

Besset (1968: 44) is adamant that despite earlier spatial explorations, most notably by Wright, [17] the self-conscious manipulation of architectural space had resulted from cubist painting:

> "The liberation of space which Cubism had accomplished in the sphere of the plastic arts ... opened up vast horizons in architecture also: mobilization of space, transparency of 'open' structures, geometrization of formal elements. All of these were demands implicit in the new architectural ethic which had been evolving since the turn of the century, but which the example of Cubism alone enabled architects to assimilate aesthetically. This shock was necessary before architecture could break free from the inertia of a stereomatic way of thinking ..."

Therefore, Cubism had provided modern architecture with a radically new conceptual point of departure that not only related to the customary enclosure of habitable space, but also enabled a predetermined spatial modulation with which to engender a variety of emotional experiences and plastic sensations.

8.9.3 The Spatial Paradox

The tectonic assimilation of the novel spatial consciousness found its most resounding expression in purist architecture. In fact, the majority of the inferences made by 20th century architectural historians with regard to space (whether acknowledging the generating cubist precedent or not) were derived from Le Corbusier's spatial antics of the 1920s. [18]

Naegele (1995: 93), however, draws attention to the extraordinary fact that purist theory seldom addressed the issue of space – irrespective of painting or architecture and, yet, so distinctly pertinent to both. Le Corbusier certainly cited space (in addition to light, shade and walls) as the last of the four supposed elements of architecture in *Vers une Architecture* (1923; 1987: 5), but the attainment of visual equilibrium remained his overriding preoccupation. Two years earlier, Le Corbusier and Ozenfant mentioned in "Le Purisme" that "Space is needed for architectural composition; space means three dimensions. Therefore we think of the painting not as a surface, but as a space" (Reichlin, 1997: 196), but they refrained from elaboration. Instead, they contradicted this ambiguous statement due to their incessant emphasis on order and harmony, which related, specifically, to the compositional treatment of the surface. Von Moos (1979: 38) adds to this paradox by referring to *Après le Cubisme* where the authors stated emphatically that the supposedly fourth dimension in art was no more than a "gratuitous hypothesis by the theorists of Cubism". Jencks (1973: 52) also labours the point:

---

17 Wright is generally regarded as the first modern architect who engaged self-consciously with the notion of space, but, as Besset, M., 1968, *Who Was Le Corbusier?* trans. Kemball, R. (Geneva: Editions d'Art Albert Skiva), 40-41, points out, he approached it from different premises than those of his European counterparts. Wright's spatial awareness resulted from the skeletal constructions utilized in the skyscrapers of Chicago – not dissimilar to Dom-ino. He employed the same design principles in his Prairie Houses of 1902-1909, which contributed to the spatial liberation of the traditional, enclosed, domestic prototypes. By contrast, the Europeans pursued the notion space through artistic investigations.

18 Giedion was the first architectural historian of the 20th century to document most extensively the alliance between modern art and modern architecture, with explicit reference to Cubism. His seminal writing *Space, Time and Architecture: Growth of a New Tradition*, 1941; 1967 (Cambridge, Mass.: Harvard Univ. Press), was largely responsible for the acceptance of space as the modern contribution made to the semantics of architecture. Giedion provided a pioneering account of how Cubism and the revolutionary space-time dimension manifested in Le Corbusier's architecture, particularly in Villa Savoye. However, with the passage of time, the information appears to be somewhat scanty.

> "The first chapter on Cubism [in *Après le Cubisme*], probably written by Ozenfant, attacks the movement because of its obscurity, its mythical scientism (all the talk about the fourth dimension) and its lack of representation."

(The reference to a mythical scientism is somewhat ludicrous when one considers the cumbersome metaphysical and quasi-scientific approaches adopted by the Purists to ratify the deficiencies of cubist compositions.) Naegele (1995: 93) proposes that the theoretical content of Purism was a concerted effort by its authors to concentrate on how it differed from other art movements and, consequently, did not include references to characteristics common to all..

Reichlin (1997: 196) – author of one of the few, and most recent, assessments of Le Corbusier's purist paintings and purist architecture – is of a contrary opinion. He maintains that "the concept of space plays a central role in the theory and practice of purist painting". Reichlin makes a convincing case for the latter, but less so with regard to its theoretical component – save for providing selected extracts from "Le Purisme", including the aforegoing, ambiguous quotation.

The reference to space is also conspicuously absent in Le Corbusier's description of the advantages of the five points of a new architecture, as expounded in the 1927 catalogue of the Weissenhofsiedlung. With respect to the *plan libre*, the most vivid demonstration of the new spatial revelation, he merely stated:

> "In the past, the plan had been the slave of the structural walls ... Reinforced concrete brought the innovation of the free plan in which the interiors were no longer rigidly determined by structural walls. They had become free." (Kirsch, 1989: 50) [19]

Ulrich Conrad's translation (1964; 1970: 99) of the "Five Points towards a New Architecture", published first in *Almanach d'Architecture Moderne*, Paris 1925/6, reads as follows:

> "The theoretical considerations set out below are based on many years of practical experience on building sites. Theory demands concise formulation. The following points in no way relate to aesthetic fantasies or a striving for fashionable effects, but concern architectural facts that imply an entirely new kind of building, from the dwelling house to palatial edifices."

It was only after the Second World War, and coinciding with Giedion's recommendation that the modern interpretation of plastic space was the primary contribution made to the universal semantics of architecture, [20] that Le Corbusier started making explicit references to space. In *New World of Space* (1948a: 8) Le Corbusier finally acknowledged his indebtedness to the revolutionary spatial paradigm introduced by the Cubists:

---

19 The first description of Le Corbusier's "Five Points of New Architecture" appeared in 1925/6 in *Almanach de l'Architecture Moderne*. It also made its appearance in the booklet *Weissenhof*, compiled by Alfred Roth, as part of the celebrations of the Weissenhofsiedlung in 1927. This particular extract is from Kirsch, K., 1989, *The Weissenhofsiedlung* (New York: Rizzoli), 50.

20 Towards the end of the 1930s, the initial enchantment with modern technology was surpassed by an increasing sense of disillusionment. Apart from the unprecedented political interference with aesthetic expression by both Hitler and Stalin, the devastation caused by the Second World War contributed to a further loss of faith in modern technology. It is not surprising that Giedion's *Space, Time and Architecture: The Growth of a New Tradition* found a receptive audience after the war, whereupon space – instead of utilitarian and technological considerations – was consecrated as the essence of modern architecture. Ironically, a stage when most of the theoretical investigations into the self-conscious manipulation of space had long ceased to exist.

> "I may say something of the 'magnification' of space that some of the artists of my generation attempted around 1910 during the wonderfully creative flights of cubism. They spoke of the fourth dimension [*sic*] with intuition and clairvoyance ... The fourth dimension is the moment of limitless escape evoked by an exceptionally just consonance of the plastic means employed."

In this work (1948a: 7), Le Corbusier even referred to his own spatial interpretation as an example of so-called ineffable space – "a miraculous manifestation of plastic acoustics".

However, Le Corbusier did often enough refer to mass and volume, making a definite distinction between these three plastic phenomena, considering volume (rather than space) as the "primordial basis of architectural sensation" (Besset, 1968: 96). It can, on the one hand, be advanced that the reference to volume coincides with Le Corbusier's sustained interest in form. On the other hand, as co-editor of *L'Esprit Nouveau* there can be no doubt that Le Corbusier must have been highly informed about the new polemics of space. [21] He was particularly familiar with the "perforated sculptures" (his term) of the cubist sculptors, [22] in addition to the spatial explorations of the De Stijl architects, whose retrospective exhibition, hosted in Paris in 1923, he had attended. [23]

Le Corbusier's somewhat unselfconscious response to an assimilated spatial awareness is not dissimilar to that of Picasso who denied vehemently any intentional retort to Einstein's scientific theories. It would seem that both Picasso and Le Corbusier responded implicitly to a collective consciousness at a particular point in time, though in both their instances, internalized through the medium of painting.

8.9.4 Le Corbusier's Artistic Response to Space

Despite their above-mentioned criticism of the fourth dimension, the Purists did employ the cubist technique of simultaneous depiction, but it has been advanced that it was adopted for conceptual rather than spatial purposes. Notwithstanding, the same space-time conclusions drawn from cubist paintings apply inevitably to the *peintures puristes*. Le Corbusier's own spatial intentions are apparent particularly in the orthographic renderings that projected simultaneously in both directions. These painterly gestures, firstly, alluded to the voluminousness of the object itself and, secondly, created a distinct sense of space around the depicted artefacts.

In keeping with the practice at the time, the Purists, too, questioned the legitimacy of customary representational techniques, especially perspective. A translated extract from their famous essay "Le Purisme" of 1921 reads as follows:

---

21 For example, an article, entitled "A Propos des Théories d'Einstein", by Paul le Becq had been published in *L'Esprit Nouveau*, no. 7 in 1922/3.

22 Besset (1968: 38) mentions that Le Corbusier and Ozenfant were among the first to publish examples of cubist sculptures. Besset (*ibid.*) provides an unsourced quotation by Le Corbusier, though made in 1936, in which the architect commented that the implications of these sculptors' work had not yet been fully comprehended, but he still refrained from making any specific reference to space, reading:: "Following the Cubist revolt and revolution, we saw sculptors create 'perforated sculpture' because they realized that in this way it could be incorporated more multifariously into a site, a whole landscape, a whole room ... It is safe to say that this sculpture is an unprecedented venture and that something new will come out of it." Le Corbusier also shared a close relationship with Lipchitz, from whom he had designed a studio-residence, Atelier Lipchitz-Miestchaninoff, Boulogne-sur-Seine, in 1924, and whose sculptures were exhibited at the Pavillon L'Esprit Nouveau in 1925.

23 Besset (*ibid.*: 93) advances that Le Corbusier might have been familiar with the theories of Neo-Plasticism since 1920. Serenyi, P. 1975, "Le Corbusier's Changing Attitude to Form", in Serenyi (ed.), *Le Corbusier in Perspective* , 69, maintains that Rietveld's Schröder-Schräder House, Utrecht (1924), had exerted a considerable influence on the realization of Villa Baizeau, designed some three years later.

> "Our concept of the object comes from total knowledge of it, a knowledge acquired by the experience of our senses, tactile knowledge ... the usual perspective only acts as the shutter release for the memory of these experiences." (Naegele, 1995: 94)

In addition to novel orthographic projections, Le Corbusier engaged in the hierarchial use of colour and tone, and introduced silhouette and shadow profiles to both imply and reinforce pictorial depth. As outlined in the previous chapter, Le Corbusier's paintings consistently exhibit premeditated spatial sensations. Reichlin (1997: 199) rightfully observes:

> "In the development of preliminary drawings into finished painting, Jeanneret progressively attenuated the modelling of objects and the articulation of spatial depth. But at the same time he rebalanced the relation between the supposedly center of the composition and the periphery of the painting, instituting an even saturation of spaces and events."

During rudimentary stage of Purism, the subject matter was intentionally rendered as free-standing objects of space, existing in space. On the authority of Naegele (1995: 90-91), Le Corbusier remarked retrospectively:

> "L-C lost the use of his left eye when doing this drawing *[La Cheminée]* at night: separation of the retina. This first picture is a key to an understanding of his plastic art: mass in space. Space."

The next stage of purist painting signified an overriding concern with the volumetric velocity of the *objets-types*, analogous to his much-quoted statement from *Vers une Architecture* (1923; 1987: 218) that architecture is "the skillful, accurate and magnificent play of volumes seen in light". Even when he engaged in the planimetric aspects of his subject matter, did he continue to allude to pictorial depth. In fact, during this final stage of purist painting, Le Corbusier appears preoccupied with contradictory spatial illusions. The manner in which the pictorial content hovers between the two-dimensional and three-dimensional resulted in disconcerting spatial ambiguities, creating the distinctly aspectival reading of space that found precedent in his mature Purist villas.

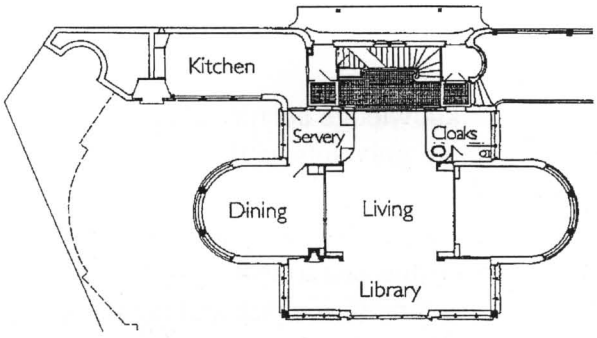
8.9.5 Le Corbusier's Architectural Response to Space

8.9.5.1 Dom-Ino as Self-Referential Sign

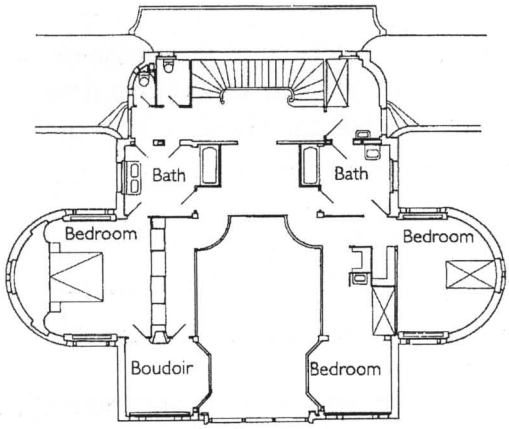
Despite the perplexing fact that Le Corbusier refrained from making any substantial references to space during the 1920s, his painterly explorations, firstly, enabled him to internalize the complex spatial dimension of Cubism and, secondly, honed his own spatial sensibilities which he concretized magnificently in his purist architecture.

Significantly, Le Corbusier had independently from any artistic precedent and rather unselfconsciously devised the vehicle for the manifestation of the assimilated spatial consciousness. If Picasso's spontaneous decision to violate the rules of perspective induced the modern aesthetic awareness of space, then Le Corbusier, in Dom-ino, discovered the tectonic means through which this spatial cognition could pragmatically be realized. As Plattus (1987: 17) observes:

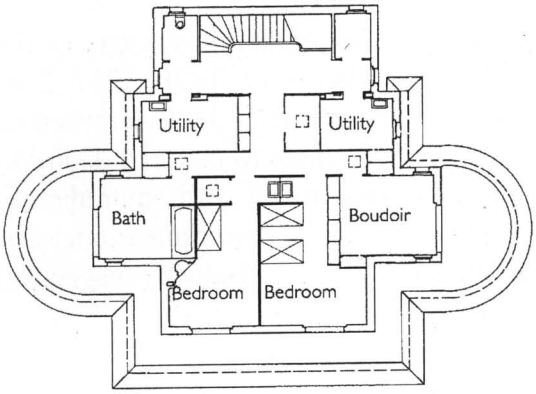
> "As one places Le Corbusier 'in context' and traces historical genealogies of the themes and images inherited, it is easy to lose sight of the fact that he, along with a handful of others, is responsible for the invention of a genuinely modern architectural space ..."



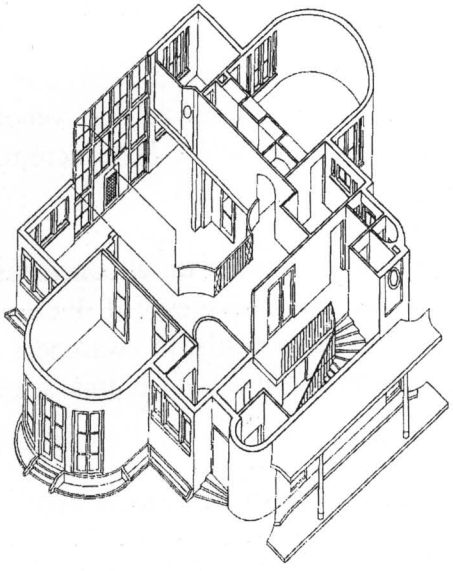
Ground floor plan



First floor plan

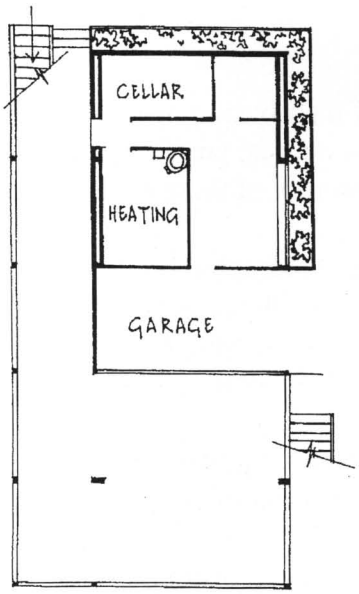


Second floor plan

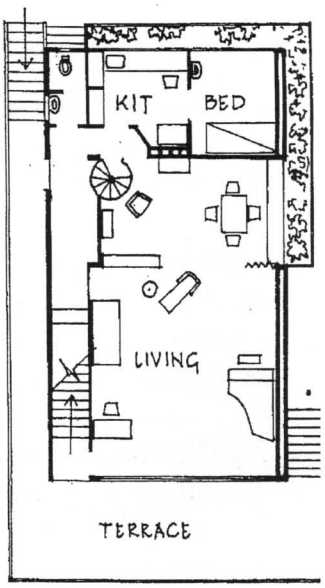


Axonometric

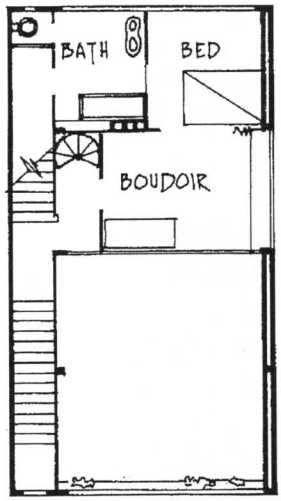
8.37 Villa Schwob, La Chaux-de-Fonds (1916).



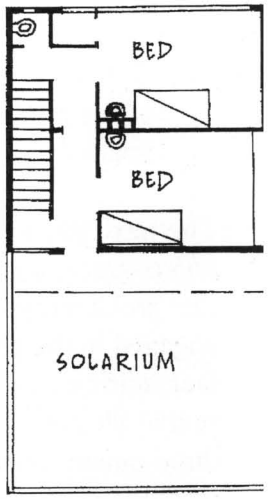
Ground floor plan



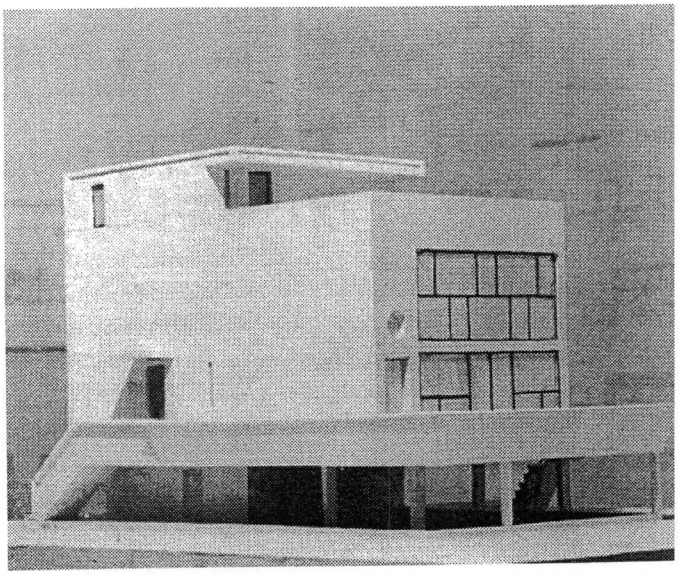
First floor plan



Second floor plan



Third floor plan



Model

8.38 Maison Citrohan, project (1921).

However, this thesis proposes that, had it not been for Le Corbusier's painterly pursuits, the intensification of the spatial experience in his architecture would have been unlikely.

Contemporary architect and theorist Peter Eisenman (1990: 119-128) describes Dom-ino as a self-referential sign. He reprimands architectural historians, Rowe in particular, for having obscured this significance by ascribing extraneous considerations to it; issues, in his opinion, that are extrinsic to architecture itself. Eisenman advances that this self-referring disposition of Dom-ino is consistently being overlooked – a condition that coincides with modern art, modern music and modern literature, [24] which resulted from the rejection of the narrative and mimetic representation. According to Eisenman (*ibid.*: 121), it is Dom-ino's "preoccupation with its own essence" – its inherent possibilities other than obvious utilitarian considerations – that affords it the distinction of being definitively modern:

> "[By] looking at ... Dom-ino with a different lens, proposing a different conceptual spectrum, it is possible to see in the precise selection, size and number, and location of the elements in the Dom-ino diagram the incipient presence of the self-referential sign. Such a sign notation ... begins to define not only a Modernist condition of architecture, but ... [defines] certain minimal conditions for any architecture ... its existence as an architecture about architecture."

Eisenman's views coincide with this author's conclusions that Le Corbusier was only able to internalize the full spectrum of Dom-ino's potential as a result of his painterly investigations, which obviously qualify as a self-referential form of art, as corroborated by Naegele (1995: 106):

> "Purism, like so much Parisian avant-garde art at the time, was a self-referential art, an art which constantly called attention to the act of seeing."

As indicated, Le Corbusier did not comprehend Dom-ino's self-referential significance instantaneously. It evolved gradually in his architecture over a period of time. Notwithstanding, and as Banham (1962; 1975: 56) rightly observes, Dom-ino – as an intrinsic ordering device – represented a "geometric order of space", enabling the architect's "free-play" with, and upon, that space. Thus, Dom-ino afforded Le Corbusier the tectonic means with which the spatial revelations of Cubism could be realized.

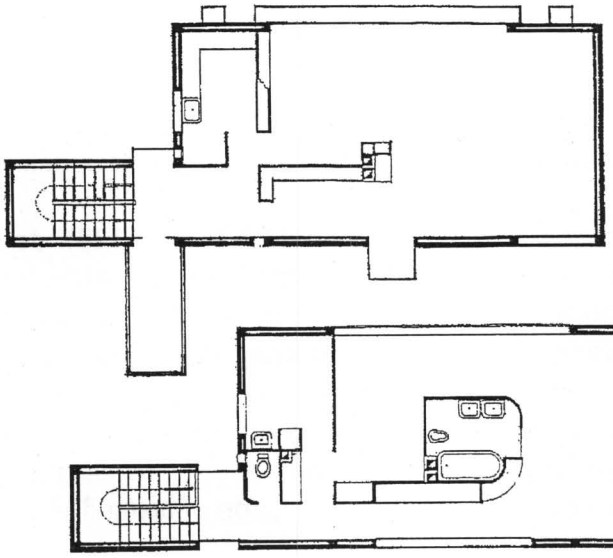
8.9.5.2 The Spatial Intensification of Purist Architecture

In concluding this reflection on the spatial aspects of Le Corbusier's architecture, a brief review of the spatial intensification of his purist villas is deemed necessary.

Le Corbusier had already introduced in 1916 a dramatic double volume space in his pre-purist architecture, which henceforth remained a salient feature. However, the double volume in Villa Schwob stemmed rather from an admiration for Byzantine architecture than from an interest in space *per se*. The Citrohan prototype also sported a double volume, but, according to Frampton (1980: 153-154), it was derived from a Parisian bistro that Le Corbusier frequented – a relatively insignificant demonstration of spatial interpenetration. Yet, a comparison of these two Corbusian examples (*figs 8.37-8.38*), clearly shows that the double volume in Villa Schwob materialized from the volumetric implication of form, whereas in Maison Citrohan it was motivated from the experience inherent in the space itself.

---

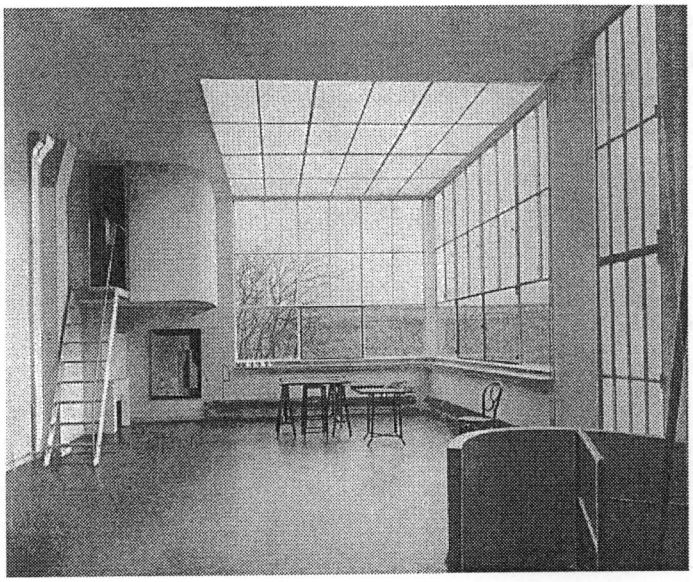
24 This preoccupation, of course, resulted from the impact of photography on the pictorial arts, which, via Impressionism, culminated in the genesis of Cubism and other 'self-referring' derivatives. As mentioned before, the concurrent developments in literature – initiated by James Joyce, (1882-1941) Virginia Woolf (1882-1941 [*sic*]) and Stein – and music – Stravinsky and Satie, amongst others – demonstrated the same internalized dispositions.

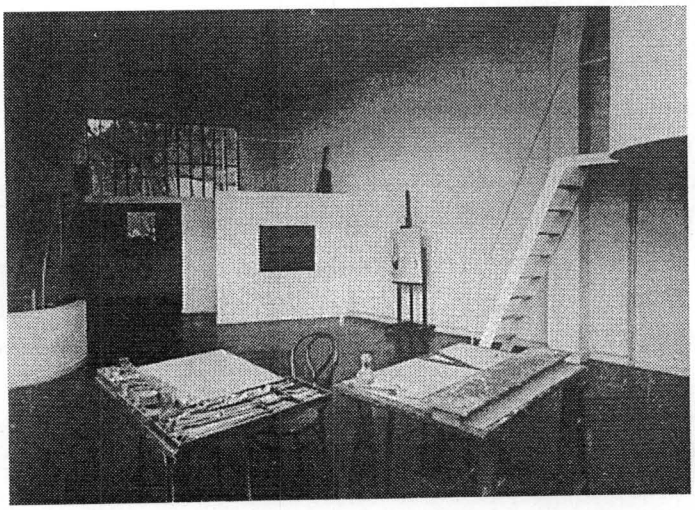


First floor plan

Second floor plan

8.39 Villa Besnus [Ker-Ka-Ré], Vaucresson (1923).





8.40 Interiors, Atelier Ozenfant, Paris (1923).

The spatial intensification of Le Corbusier's architecture commenced with the designs of Villa Besnus and Atelier Ozenfant – a stage when Volumetric Purism had already been surpassed by its fragmented phase. Although modelled on a classical precedent, Villa Besnus is the first example in which architectural components, that had traditionally been confined to the periphery of the building envelope, were treated as free-standing elements (*fig. 8.39*). Perhaps because Villa Besnus lacked the characteristic double volume, it is the one instance where Le Corbusier had to consider an alternative flow of space, hence in a horizontal direction and, presumably, the resultant act of dislocation. Significantly, this latter gesture called attention to inherent volumetric propensity of the various tectonic components, which, in addition to service cores, in due course included free-standing staircases, fire-places and columns. Besset (1968: 82) remarks:

> "In the initial phase (Dom-ino system, Schwob House), the replacement of load-bearing walls by pillars forming pin-point support was regarded only from an economical angle: the pillars were still included in the partitions, which were henceforth non-load-bearing and were produced by inexpensive materials. During the second stage [commencing with Villa Besnus], 'the pillars left the corners and calmly stood in the middle of the rooms.' Finally, 'the chimneys left the walls'."

These relocated, free-standing components also contributed to the persuasive flow of space, enabling the architect to take full advantage of the liberating implications of Dom-ino. Although Villa Besnus is the most tentative demonstration of this spatial effect, Le Corbusier was soon to comment on the "outer membrane" within which "organs" were freely distributed; diagnostically, rationalizing his design decision in the light of non-artistic considerations, as this unsourced quotation from Besset (*ibid.*: 86) indictes:

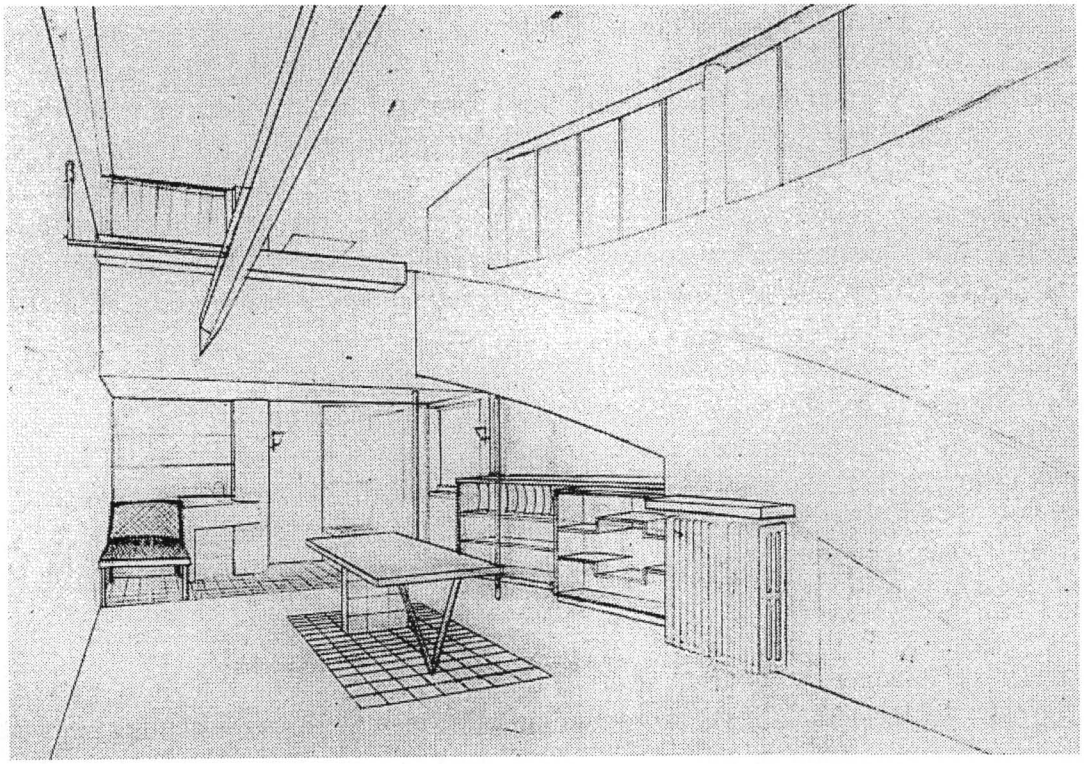
> "One day we noticed that the house, like the motor- car, could be a simple outer covering or membrane, containing multiple organs in free arrangement."

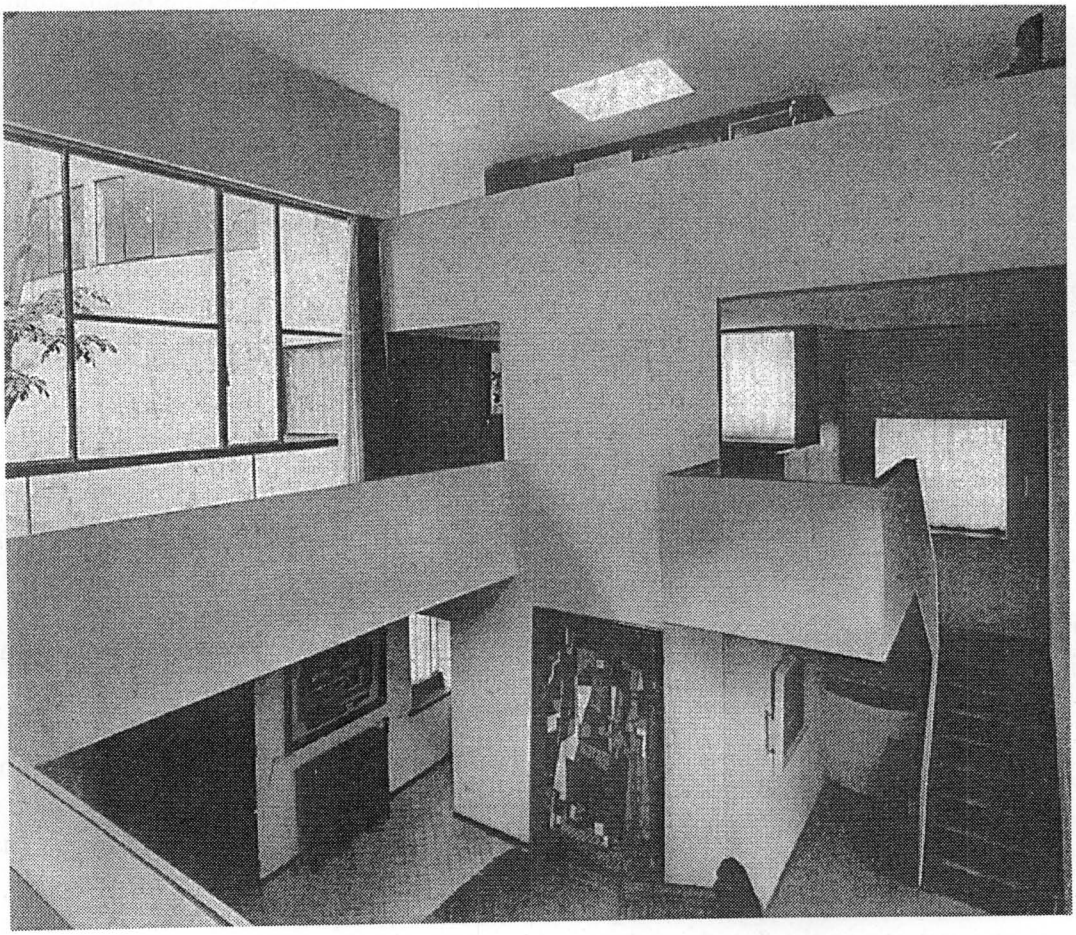
Contrary to Le Corbusier's statement, these particular spatial sensations recall the still-lifes of Volumetric Purism where the orthographic-projected *objets-types* exist as volumes in a space contained only by the confines of the canvas, thereby, accentuating the spatial flow around the voluminous obstacles. These pictorial observations coincide with Banham's (1962; 1975: 56) description of Le Corbusier's purist architecture:

> "Space in [Le Corbusier's] architecture, does not flow from the centre of a simple square room – there one experiences only a still 'Renaissance' space. It flows round corners, over the edges of balconies, along corridors, up ... staircases ... and round and behind obstacles and free-standing objects of all kinds."

Reichlin (1997: 202-203) also refers to the spatial significance of Villa Besnus in his comparison between purist art and purist architecture, providing the following accurate assessment:

> "Let us consider the Villa Besnus at Vaucresson ... The symmetry of the villa's elevations might lead one to expect large interior spaces centered on the great bays, but in fact a bathroom occupies the center of the first floor ... Once inside, the visitor is forced to the periphery and must discover the interior progressively, through partial, curtailed views ... There is no privileged viewpoint, no framing threshold to be grasped at a glance. Neither on the living room level nor on the first floor does the enveloping space offer itself in its entirety. Here are no viewpoints like those implicit in traditional interiors – viewpoints to which the traditional iconography of the 'interior' refers, based as that iconography is on rules of one-point perspective."





8.41 Interiors, Maisons La Roche-Jeanneret, Paris (1923).

Atelier Ozenfant, like most of the purist villas from this point onwards, synthesized the spatial revelations that Le Corbusier's purist paintings afforded him. The spatial complexity of Atelier Ozenfant culminated in the double volume studio space where the plastic potential of the staircases, landings and walls was exploited to maximum effect (*fig. 8.40*). The contrast of linear, planar and curvilinear forms promotes a simultaneous projection and recession, creating suggestions of depth and flatness at the same time. In addition, the corner window that extends to the roof plane amplifies the sensation of depth with its mullions projecting to a vanishing point far beyond. These conflicting cues, coinciding with the emblematic aspectival readings of purist paintings, introduced the spatial ambiguity that was to characterize his future purist villas. Reichlin (1997: 203) adds:

> "From the outset, Le Corbusier's 'architectural' objective in his purist paintings was not formulated to privilege a single viewpoint from which forms are controlled. In his architecture proper, Le Corbusier presupposed a plurality of views, itineraries, and readings."

Reichlin (*ibid.*: 203) also refers to the strip window as an "antiperspectival device", since it denies the curtailed views imposed by a traditional, narrow cone of vision offered by traditional windows, and analogous to the single vantage point of linear perspective.

In Le Corbusier's next design commission, Maisons La Roche-Jeanneret, the double volume was surpassed by a triple volume, with an uninterrupted flow of space which extended simultaneously in different directions (*fig. 8.41*). The consideration that Le Corbusier had by this stage given to a deliberated spatial animation can be substantiated as follows:

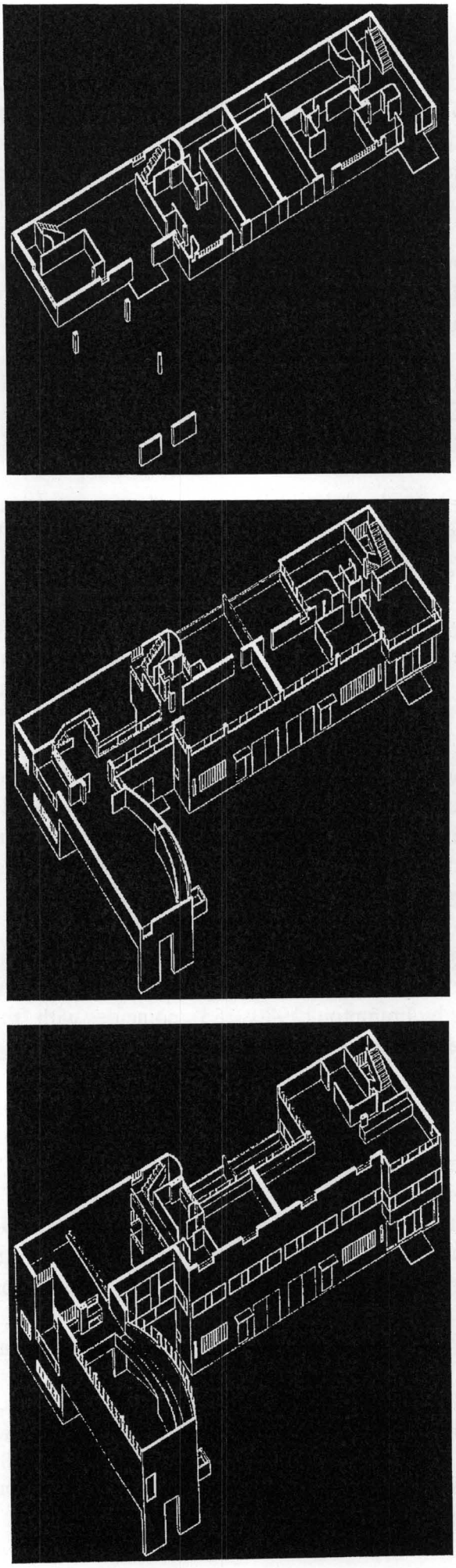
1. The accommodation was arranged in such a manner to continually circulate back to the triple volume entrance hall, permitting one to experience the spatial sensation anew each time from a completely different vantage point. This design consideration signified Le Corbusier's attention given to route as a procession through space and time, enabling the user to actively participate in the aspectival reading of modern space.

2. A distinctly layered spatial effect was created by superimposed tectonic features that must have been considered with their volumetric implications in mind. The resultant condition, coined *cubist coulisse* by Frampton (1980: 155), coincides with "the great moments of depth that occur through the gaps in the overlapping of cubist paintings".

3. The sudden introduction of colour in the interior is particularly significant since it was intentionally applied to create, reinforce and even contradict sensations of depth. [25]
On the authority of Besset (1968: 90, 93), Le Corbusier remarked: "The first experiments in multi-color (in the La Roche House), based on specific reactions of the colors, introduced the possibility of architectural camouflage, i.e. the emphasizing of certain masses, or alternatively, their effacement ..." Also, "... consider color as a contributor of space ... We'll get the painters in to blow up the walls that stand in our way ... If this or that wall is blue, it recedes; if it is red, it holds the plane, or brown; I can paint it black, or yellow ... Architectural polychromy doesn't kill the walls, but it can move them back and classify them in order of importance."

---

25 The use of colour in buildings for purposes other than decoration had been studied by the Neo-Plasticists since 1917. It is certainly no coincidence that Le Corbusier only started to apply colour to his buildings in the same year that the famous De Stijl exhibition was hosted in Paris. However, Le Corbusier's application of colour coincided with the aesthetic theories of Purism.



8.42 Axonometric projections. Maisons La Roche-Jeanneret, Paris (1923).

4. The introduction of the ramp for domestic use is equally important, [26] contributing to a kinetic spatial sensation.

These contemplated design considerations and the resultant spatial implications dominate in all Le Corbusier's purist villas from this point onwards. The flow of space in different directions, the interpenetration of space, residual space contained by the building envelope and at the same extended far beyond, the integration of the inside with the outside, deliberated spatial voyages, and experiential spatial sensations are all features that contributed his dramatic symphonies of space (*figs 8.42-8.43*).

8.9.5.3 Space-Time Paradigm

The implied fourth dimension manifested in Le Corbusier's architecture in several ways and justifies commentary. Although the space-time conclusions drawn by academics may not necessarily have been consciously intended by the architect, they are by no means unwarranted.

As indicated, the still-lifes of Rudimentary and Volumetric Purism do invite an imaginary sense of movement amongst the voluminous artefacts. This sensation of movement was mimicked architecturally where it materialized as journeys through space, and in time. Albeit somewhat tortuously introduced in Atelier Ozenfant, Le Corbusier's so-called *promenade architecturale* [27] became an important design feature, culminating splendidly in Villa Savoye.

On the one hand, the movement through a series of different spaces endorsed the multitude vantage points of cubist painting, creating the distinctly aspectival spatial experience in contrast with the static spatial observations of classical architecture. As a result, one has to move through the building in order to comprehend the architect's intentions and engage in the unfolding spatial drama. Paraphrased in Le Corbusier's own words:

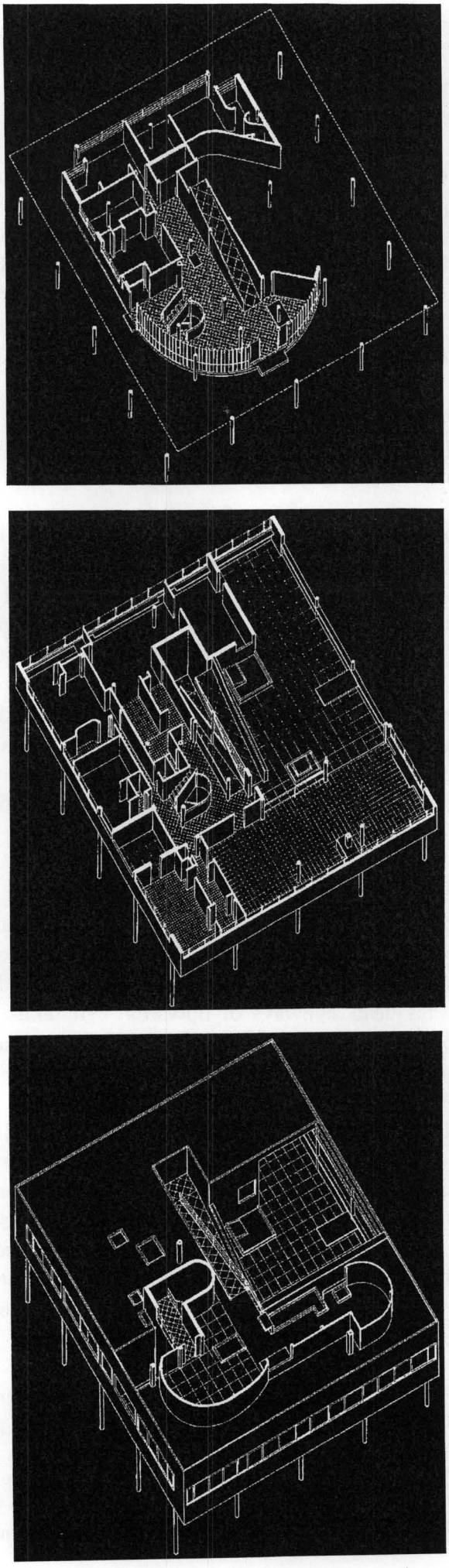
> "... you approach, you see, you get interested, you appreciate, you go all the way around, you discover things. You keep getting different impressions, one after the other. And the game being played becomes apparent. You walk about, you keep moving and turning around. Note what apparatus man responds to architecture with: he has two eyes which can look ahead; he can turn his head sideways or upwards ... It takes hundreds of successive perceptions to make up his architectural sensation. It is his promenade, his ramble, that counts, that is the prime mover of architectural events." (Besset, 1968: 100-101)

On the other hand, the spatial experience was further enhanced by the inclined floor plane of the ramp, creating a permanent spatial continuum in a manner that incremental stairs cannot. Due to added fact that the ramp in Maisons La Roche-Jeanneret was curved, it created a sensation of simultaneous movement in *three* directions: up, down and sideways. Giedion (1941; 1967: 529) considered the spatial kinetics that resulted from this method of moving through space and time the architectural equivalent of the scientific theories of the day. In Villa Savoye, Le Corbusier further exploited the spatial dynamics inherent in the ramp by incorporating the additional sensation of being inside and outside in one sequential experience of movement.

---

26 According to Baker (1996: 239-240), Le Corbusier's first use of the ramp appeared in 1917 in two abattoir designs for Bordeaux and Challuy, respectively. Although neither project was ever built, the proposed ramps were motivated exclusively from practical considerations.

27 The *promenade architecturale* refers to Le Corbusier's denotation of the procession of movement, which, according to Gans, D., 1987, *The Le Corbusier Guide* (New Jersey: Princeton Univ. Press), 66, was also inspired by the Arabic architecture of North Africa with its unfolding sequence of spaces. Le Corbusier frequently referred to *l'espace arabe*.



8.43 Axonometric Projections, Villa Savoye, Paris (1931).

Based on his research of Le Corbusier's purist paintings, Reichlin (1997: 205), too, arrives at similar conclusions:

> "The space of a painting is virtual, and the exterior point of view unique. The before and after of the various readings invited in a purist painting correspond to an essentially mental time. By contrast, the understanding of architecture requires a multiplicity of views integrated with each other during the real time of a tour ... it is here that the idea of the promenade arises. What is required is a 'tour', in the real time and space of observation, selects and structures 'physical sensations' so that the viewer's mind – the observer's mental, fixed 'place' – yields a synthesis of 'elective' images that permits an exhausting understanding of an object, a recreation of the 'creative moment'."

In this context, it is worth reiterating the Purists's statement from "Le Purisme" (Naegele, 1995: 94) that their "concept of the object" comes from "total knowledge of it, a knowledge acquired by the experience of our senses, tactile knowledge" – a cognition denied by perspective, but induced by Picasso's pioneering aspectival contributions to the visual and plastic arts.

Lastly, Eisenman (1990: 124) draws attention to another manner in which the cubist notion of simultaneity manifested in Le Corbusier's purist architecture. In examples such as Villas Stein-de Monzie and Savoye, and read from a distance, it appears as if the front façades had been superimposed onto their internal elevations. With alternate viewpoints presented all at once, this optical phenomenon acts, firstly, as a vivid – architectural, that is – demonstration of the relative position that the observer occupies in time and space, and creates, secondly, a sensation of depth that is simultaneously real (physically) and virtual (pictorially). This observation provides yet another compelling correlation between Le Corbusier's purist architecture and his *peintures puristes*, particularly those dating from Fragmented Purism. It again reinforces the profound manner in which Le Corbusier's architecture was influenced by Cubism and, subsequently, by his own painterly investigations. However, whether such theoretical conclusions were intentional or were merely a subliminal response to prevailing tendencies, remain open for debate.

Notwithstanding, there can be no doubt that by having synthesized the plastic revelations derived from his paintings with the tectonic potential that Dom-ino afforded him, Le Corbusier developed a spatial repertoire unsurpassed by few.

8.10 SUMMARY

This chapter reviewed the transformation of Le Corbusier's architecture that had resulted from his artistic career. A brief reflection on his formative influences was followed by an analysis of the various correlations between his purist art and architecture.

Le Corbusier's earliest projects were a synthesis of Jugendstil, Arts and Crafts and Swiss vernacular, followed by a tempered Classicism due to his travels between 1907 until 1911, and contact with the early proponents of the Modern Movement. However, the development of the Dom-ino structural system, commenced in October 1914 with the assistance of the Swiss engineer Max du Bois, remains the principal accomplishment of his formative years.

The genesis of Purism coincided with Le Corbusier's decision to emigrate from Switzerland to France in 1917. Although financially one of the most adverse periods in his life, the next six years were invigorating from an intellectual point of view. Apart from distinguishing himself as a writer and painter, Le Corbusier also pursued his architectural interests through his pivotal housing prototypes, Maisons Monol and Citrohan, collective housing project, Les Immeuble Villas, and contentious urban planning proposals, Une Ville Contemporaine and Plan Voisin. This period of intense theoretic enquiry culminated in the publication of *Vers une Architecture* in 1923 – the influential iconography of

Modernism that was predicated upon classical aesthetic values. The remaining years of the 1920s were the most productive from a practical point of view, since the architect was able to concretize his theoretical insights in a series of villas, commencing with Villa Besnus and Atelier Ozenfant in 1923, and culminating in Villa Savoye, completed in 1931.

Despite Le Corbusier's reiteration of the dependence of his architecture on his paintings, though largely retrospectively, he refrained from elaboration. Notwithstanding, the connection between his art and architecture is far more complex and multi-faceted than could easily be assumed.

The formal component of Le Corbusier's architecture was approached from two independent sources – the one methodological, the other metaphysical. It was only though the medium of painting that he was able to synthesize these two approaches and to evolve a methodologically-derived plastic repertoire, a metaphysically-inspired design method, and a coinciding intellectual doctrine that were applicable to both fine arts and architecture.

It has been indicated that the same conceptual premises that pertained to the choise of subject matter of Le Corbusier's paintings were extended to his buildings and their environment. Pavillon l'Esprit Nouveau – an amalgamation of his theoretical design prototypes – demonstrated vividly his two different interpretations of harmony – the utilitarian equilibrium existing between function and form, and the visual equilibrium manifesting in the organization of both the pictorial and the architectural content. As a commentary on the idealized industrial culture, Pavillon l'Esprit Nouveau – in both a micro and macro context – epitomized the optimism of the Machine Age.

The physical appearance of Le Corbusier's purist villas do recall the forms and shapes of his paintings, but is has been advanced that it was the pictorial ambiguities and their inherent plastic potential that enabled him to extend his architectural repertoire way beyond the formal.

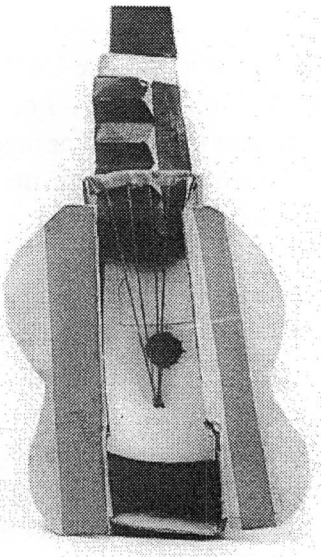
The compositional correlation between Le Corbusier's art and architecture serves as the most literal connection between these two autonomous disciplines. It was only once Dom-ino was recognized as a compositional mechanism – an ordering devise that could fulfil the same duties as his favoured *tracés régulateurs* – that Le Corbusier was able to internalize and capitalize on the tectonic advantages of his own invention. The importance ascribed to order and harmony was also reflected in his chosen terminology of "Four Compositions", which demonstrated the different formal permutations and spatial organizations afforded by Dom-Ino – evidenced by Maisons La Roche-Jeanneret, and Villas Stein de-Monzie, Baizeau and Savoye.

Given the attention to the organizing of his buildings according to metaphysically-inspired numeric conventions, Le Corbusier's architecture is often referred to as a classical Modernism, proving that it was indeed possible to synthesize two paradoxical aesthetic points of departure. However, the spatial complexity and plastic propensity inherent in his work transcends oversimplification. In spite of his lack of reference to the notion of space during the 1920s, his purist villas exude a spatial ambiguity and the distinctly aspectival spatial expression that were derived undoubtably from his artistic explorations, via the cubist precedent.

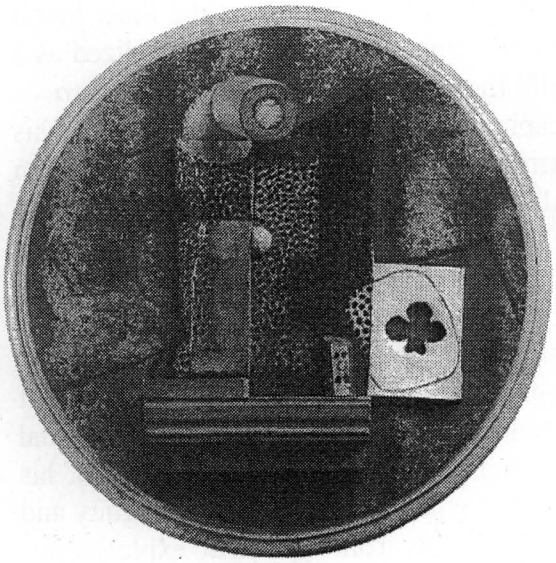
In the final analysis, Le Corbusier's painterly pursuits enabled him to, firstly, clarify his personal aesthetic position with regard to an intrinsically utilitarian discipline such as architecture and, secondly, evolve a plastic phenomenology that sustained him throughout his entire architectural career.



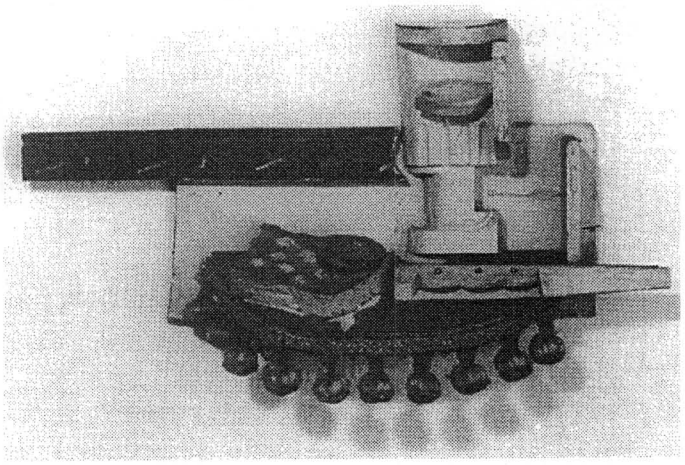
9.1 Picasso, *Woman's Head* (1909).



9.2 Picasso, *Guitar* (1912).



9.3 Picasso, *Glass, Pipe and Ace of Clubs* (1914).



9.4 Picasso, *Glass, Knife and Sandwich on a Table* (1914).

CHAPTER 9 THE VOLUMETRIC TRANSFORMATION OF CUBO-FUTURISM: THE SOVIET AVANT-GARDE

9.1 PREFACE

This chapter, and the next, continue the investigation into the volumetric incarnation of modern art that emerged, concurrent with Purism, in the Soviet Union and the Netherlands.

This particular chapter traces the architectural premises of the Soviet Union that were derived from artistic experimentation. It also reviews the extent to which the distinctive socio-political context of the USSR both contributed and undermined the aesthetic precepts on which the respective Soviet architectural initiatives were founded.

9.2 INTRODUCTION

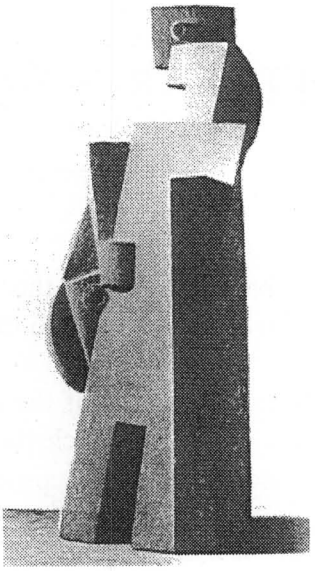
The revolutionary formal and spatial innovations of Cubism heralded incalculable consequences for the entire spectrum of the plastic arts. Yet, as Besset (1968: 40) points out, at the time of the genesis of Cubism, its creators were solely concerned with the pictorial implications of form and space – oblivious of the potentially unifying role it could play between fine arts, sculpture and architecture, which, in hindsight, seems totally apparent.

Cubism, essentially, emerged as a result of Picasso's intrigue with the depiction of the volumetric propensity of sculpture. Once he had achieved this, Picasso intermittently produced sculptures that, paradoxically, explored the pictorial innovations of Cubism in the third dimension. During the analytical phase of Cubism, Picasso's sculptures displayed the same formal characteristics that were evident in his paintings, and whereby his subject matter had been reduced to fragmented volumes (*fig. 9.1*). However, with the advent of collage in 1912, the distinction between painting and sculpture became far less obvious. It was not long before both Picasso and Braque started to produce a series of reliefs, excecuted in a novel range of materials such as cardboard, wood and sheet metal (*fig 9.2*).

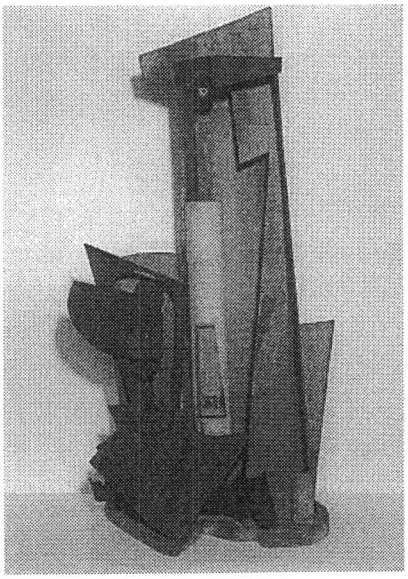
According to Cooper and Tinterow (1983: 362, 376), these reliefs were not considered by Picasso and Braque to be autonomous sculptures but to assist, instead, in establishing certain compositional and spatial relationships:

> "Several drawings Picasso made from late summer 1912 through 1913 reveal that he was studying his constructions to determine how light fell on the objects and how in turn shadows could be used to establish spatial relationships in his paintings and *papiers collés* ... Braque himself told Christian Zervos ... these reliefs were primarily intended to help 'to clarify and enrich his pictorial idiom' and were not thought by Braque as sculptures."

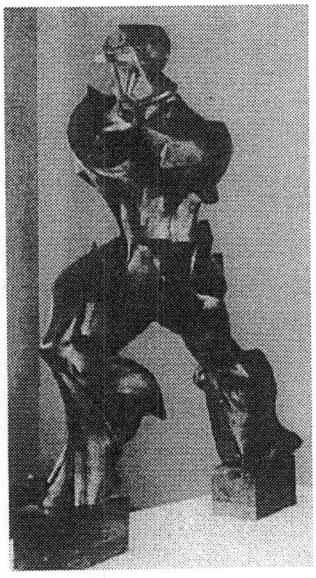
Notwithstanding, the ease with which cubist still-lifes could be extrapolated into the third dimension demonstrated how the conceptual content of Cubism could be conveyed in both the pictorial and plastic arts (*figs 9.3-9.4*); that the volumetric illusions created pictorially could be conveyed as effectively as sculptures and, ultimately, be exploited architecturally. Consequently, this additional repertoire of Cubism suggested evocative creative possibilities never conceived of before in the history of the plastic arts.



9.5 Lipchitz, *Man with a Mondolin* (1917).



9.6 Laurens, *Bottle and Glass* (1918).



9.7 Boccioni, *Unique Forms of Continuity in Space* (1913).

Following the pioneering attempts at sculpture by Picasso and Braque, a first generation of cubist sculptors emerged. The most prominent included: Jaques Lipchitz (1891-1973), Henri Laurens (1885-1954), Alexander Archipenko (1887-1964), Raymond Duchamp-Villon (1876-1918) and Constantin Brancusi (1876-1957). All these sculptors started by employing the reductive cubist idiom, simplified representational form, and emphasized the underlying geometric substructure of their subject matter (*figs 9.5-9.6*). The initial formal preoccupation was soon abandoned in favour of other plastic and, particularly, spatial considerations. Cooper and Tinterow (1983: 362) observe:

> "... the radical advance Picasso and Braque had achieved in their first cardboard constructions – the opening up of solids and the adoption of transparencies, voids and internal volumes as positive elements of the composition ... were subsequently of great consequence for future developments in sculpture. For the first time, the physical mass of a sculpture was abandoned for a new constructive method in which volume and mass were suggested instead of being literally re-created." [Emphasis added by author.]

Just as the pioneering abstract fine artists engaged in the autonomy of the rudimentary principles of the pictorial arts, modern sculptors followed suit. Consequently, plastic concepts, such as, space versus residual space, solid versus void, positive volumes versus negative volumes, transparency versus opacity, and so forth, were explored to great effect. In turn, this extended three-dimensional repertoire provided a vital connection with the semantic development of modern architecture.

9.3 FUTURIST SCULPTURE (1912-1916)

One of the most important links between sculpture and architecture was provided by the futurist signatory, the gifted Italian artist-*cum*-sculptor Boccioni. Banham (1960; 1994: 121) concurs:

> "One sees Boccioni ... in one of his most influential roles, as a codifier and systematiser of *ad hoc* Cubist practices, and their inclusion within the Futurist theory, even before they had been systematised and included within Cubist theory."

In response to the new sculptural innovations he encountered in Paris in 1912, [1] as well as the revolutionary aims of Futurism, Boccioni (1912; 1968: 300) wrote his influential "Manifesto Tecnico della Scultura Futurista", demanding a total volumetric repudiation:

> "Let us get rid of the lot, and let us proclaim the ABSOLUTE AND FINAL DISCARDING OF THE FINITE LINE AND OF THE CLOSED FORM STATUE. LET US TEAR THE BODY OPEN AND LET US INCLUDE ITS SURROUNDINGS IN IT ... Thus can the transparent planes of glass, of sheet metal, wires, electric outside and inside lighting indicate the planes, the directions, the tones and the halftones of a new reality."

---

1 Lynton, N., 1980, "Futurism", in Stangos, N. (ed.), 1991 ed., *Concepts of Modern Art* (London: Thames & Hudson), 103, mentions that Boccioni saw in Paris sculptures of Archipenko, Brancusi, Duchamp-Villon and some unspecified others. Whether these sculptors had already, at that very early stage, expanded the plastic implications of Cubism beyond the formal example of Picasso and Braque, is highly unlikely. Consequently, it is reasonable to assume that Boccioni was the first modern sculptor to recognize the plastic (versus the pictorial) potential of space.

Boccioni's creative contributions were manifold:

1. He fully grasped the plastic significance of space, demonstrated in his sculptures, *Development of a Bottle in Space* (1912) and *Unique Forms of Continuity in Space* (1913), and echoed in his manifesto (1912; 1968: 300-303): "Sculpture must ... give life to objects by making their extension in space palpable, systematic, and plastic, since no one can any longer believe that an object ends where another begins ..." Also, "We proclaim that sculpture is based on the abstract reconstruction of the planes and volumes that determine the forms, not their figurative value."

2. He expanded considerably the material repertoire of Picasso and Braque by calling for an assortment of items to be incorporated into the three-dimensional arts: "Affirm that even twenty different materials can compete in a single work to effect plastic emotions. Let us enumerate some: glass, wood, cardboard, iron, cement, horsehair, leather, cloth, mirrors, electric light, etc., etc." (*ibid.*: 304) These diverse and contrasting range of materials encapsulated distinct tactile and volumetric qualities with far-reaching plastic, conceptual, and even surreal, implications.

3. Boccioni was one of the first modern artists to realize that the new plastic revelations engendered by Cubism encompassed specific architectural connotations: "... there can be no renovation if not through a SCULPTURE OF ENVIRONMENT, for through this plasticity will be developed and, continuing, will be able to MODEL THE ATMOSPHERE that surrounds things." (*ibid.*: 304) He, moreover, had very definite views on architecture, stating in 1913: "The search for naturalistic form removes sculpture (and painting also) from both its origins and its ultimate end: architecture ... Thus I have as my ideal not a pyramidal architecture (static state), but a spiral architecture (dynamicism) ". [2]

4. Apart from these exclamations, Boccioni's extended scale of materiality, coupled with its latent tectonic, plastic and kinetic potential, found a physical counterpoint in architecture, but, as noted by Frampton (1980: 85): "Paradoxically, this concept of a spirally structured, non-monumental, mixed-media object to be extended into the immediate environment was to have more influence on Russian Post-Revolutionary 'Cubo-Futurist' Constructivism than on the evolution of Futurist architecture."

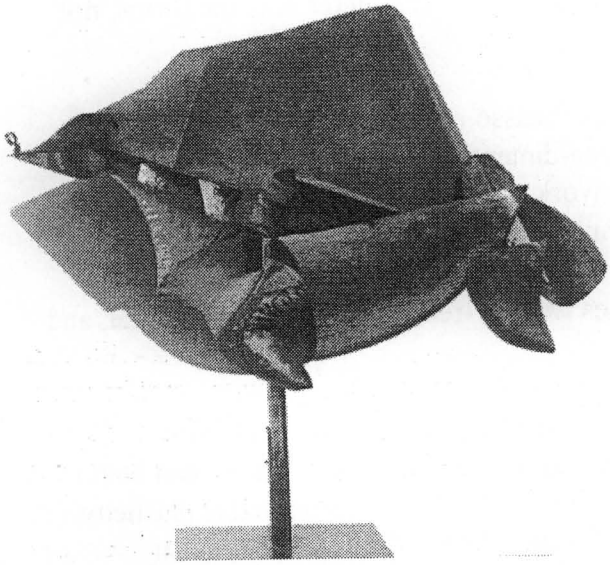
5. Most importantly, Boccioni sensed a methodological connection between modern sculpture and architecture owing to their plastic correspondence, which the seminal futurist architect Sant'Elia failed to recognize.

Since Sant'Elia's architectural portfolio was largely derived from the idealized, mechanized environments described by Marinetti, this author is of the opinion that it did not encompass even remotely the spatial inferences apprehended by Boccioni. Sant'Elia did, though, relish in the prevailing techno-scientific climate and the availability of new building materials, calling for a non-monumental, impermanent architecture devoid of ornamentation in his "Manifesto dell' Architettura Futurista". However, his eloquent visionary drawings were not entirely consistent with his precepts, [3] as endorsed by Frampton (1980: 88):

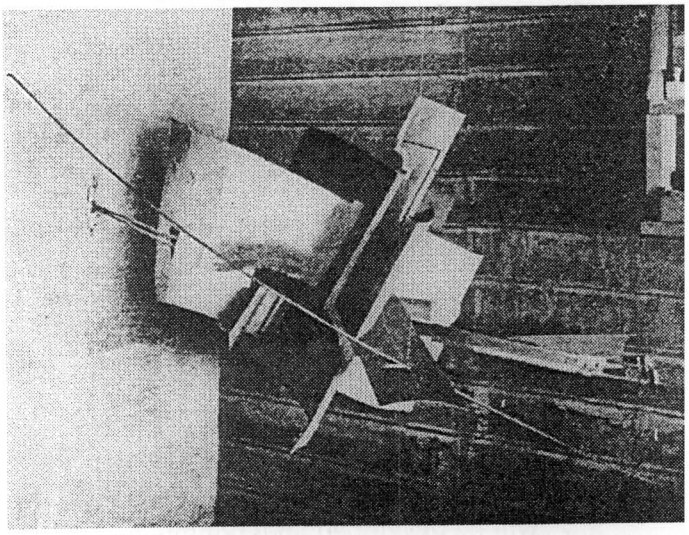
---

2 Boccioni, quoted in Frampton, K., 1980, *Modern Architecture: A Critical History* (London: Thames & Hudson), 85, from the preface of the catalogue of the first exhibition of futurist sculpture shown at Galerie Boëtie, Paris, in 1913.

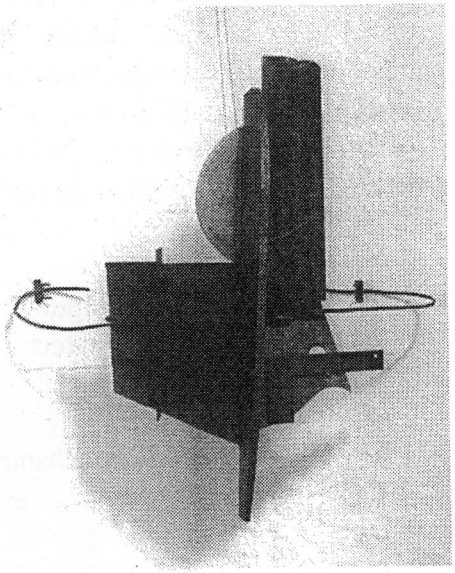
3 As mentioned in Chapter 6, it is highly probable that Marinetti altered the Sant'Elia's (and Nebia's) manifesto. Weston, R., 1996, *Modernism* (London: Phaidon), 87, contends that Marinetti added the paragraph referring to an impermanent and transient architecture, and that it did not necessarily reflect Sant' Elia's views – hence the discrepancies noted by Frampton.



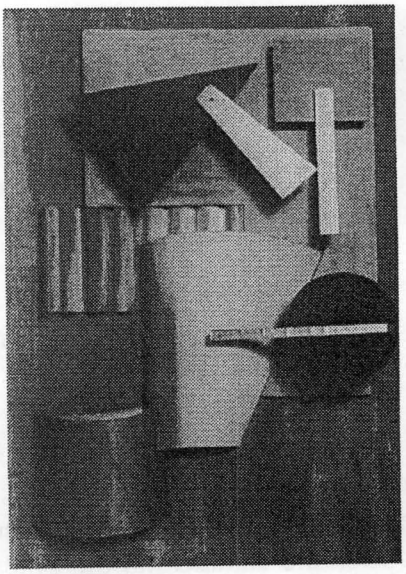
9.8 Boccioni, *Dynamicism of a Speeding Horse + Houses* (1915).



9.9 Tatlin, *Corner Relief* (1915).



9.10 Tatlin, *Counter-Corner Relief* (1915).



9.11 Puni, *Suprematist Construction* (1915).

> "Where Sant'Elia took a stand against all commemorative architecture and, in consequence, against all static and pyramidal forms, [his] drawings are replete with such monumental images."

Regrettably, Boccioni's and Sant'Elia's realizations were short-lived as both died in 1916. Their creative legacy was furthered by the ensuing cubo-futurist initiatives that emerged in Russia, as Lynton (1974; 1980: 105) points out:

> "Russia may be claimed as futurism's greatest immediate debtor ... the revolutionary art of Russia, especially the architecture, in several respects is the fulfilment of what the Milanese men had attempted."

9.4 THE ASSIMILATED SOVIET RESPONSE

9.4.1 Introduction

Modern Soviet architecture is a complex synthesis of diverse and often conflicting aesthetic and ideological premises. The author of the definitive study on pioneering Soviet architecture, Khan-Magomedov (1987: 10), criticizes Western historians for being either oblivious of this particular characteristic or deliberately choosing to ignore it. He (*ibid.*: 149-150) also deplores the fact that modern Soviet architecture is generally being reviewed under the collective banner of Constructivism, which, although the most significant, was but one of several architectural approaches that emerged during the heroic period of the Modern Movement. Presumably, the fact that the major opposition to Constructivism selected the inappropriate term "Rationalism" to denote its intrinsic perceptual and expressionist tendencies, also contributes to the prevailing acrimony and ignorance.

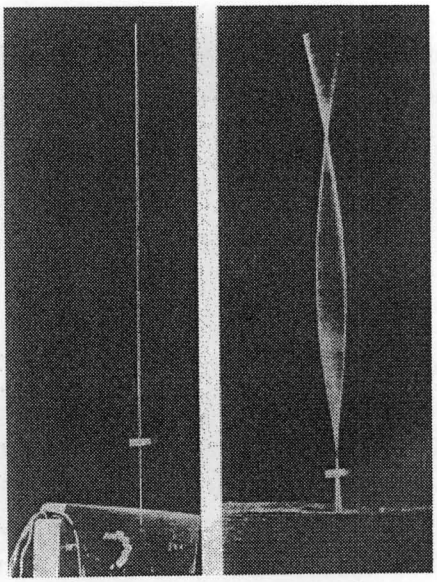
Suprematism serves as another case in point. Although Malevich's aesthetic initiatives made a substantial contribution to the crystallization of a constructivist design idiom, he was ideologically closer aligned with the Rationalists. Moreover, numerous artists and architects worked simultaneously in different modes of expression or switched from the one to the other at some point in their career, including, Lissitzky, Alexandr Rodchenko (1891-1956) and Konstantin Melnikov (1890-1974). Consequently, the history of modern Soviet architecture is fraught with contradictions. However, instead of attempting to clarify ambiguous viewpoints or individual approaches, this study highlights the extent to which Soviet Modernism was informed by artistic experimentation.

Whilst acknowledging Rationalism, this study reviews Constructivism in greater detail as it demonstrates best how political ideology and utlitarian premises undermined the very aesthetic principles upon which this particular movement was founded.

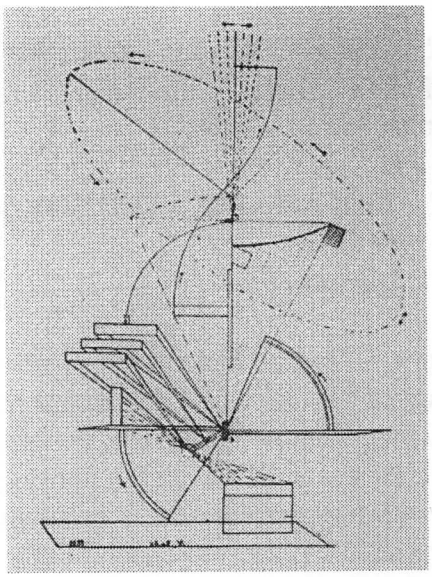
9.4.2 The Plastic Connection Extended

Although Boccioni relegated the figurative to a secondary role, he did not quite sever his ties with the phenomenological (*fig. 9.8*). Notwithstanding, his influence – apart from that of Picasso and Braque – was discernible in emerging Russian aesthetic endeavours.

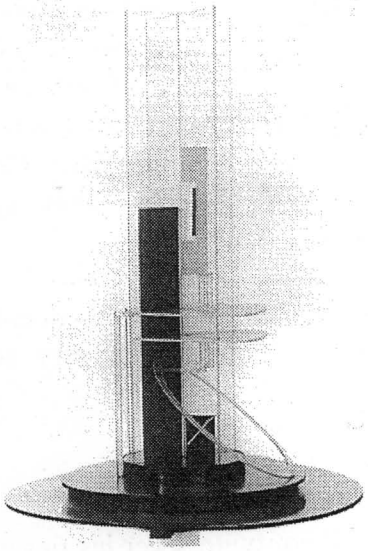
According to Chipp (1968: 312), Vladimir Tatlin (1885-1953) was the first person in the history of the plastic arts to produce in 1913 a totally abstract relief, consisting of metal, glass and wood, "pushing to an extreme although logical consequence the idea of Cubist collage and construction". Tatlin, a fine artist by training, had been experimenting with Cubism since 1911 and even designed a stage set based on cubist principles for the play *A Life of the Tzar*, by Obstrovsky in 1913. Although Tatlin's acquaintance with Malevich can surely not be disregarded, Moszynska (1990: 72) maintains that the



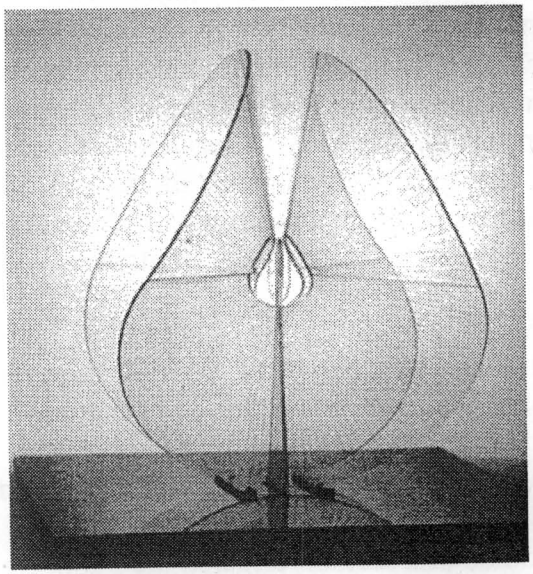
9.12 Gabo, *Kinetic Construction* (1920).



9.13 Gabo, *Kinetic Construction* (1922).



9.14 Gabo, *Column* (1923).



9.15 Gabo, *Translucent Variation on Spheric Them* (1937).

pioneering abstract sculpture was produced in response to Tatlin's visit to Picasso's studio in Paris in 1913 where he encountered the cubist reliefs first-hand.

In turn, Boccioni's influence, particularly his preoccupation with the use of materials, was soon evident in Tatlin's so-called relief constructions, exhibited at the aptly entitled "0-10, The Last Futurist Exhibition" of 1915. Tatlin's initial static, corner reliefs (*fig. 9.9*), modelled after the cubist example, had been surpassed by counter-corner reliefs that suspended in space (*fig. 9.10*). Unlike Picasso and Braque who employed somewhat indiscriminately different materials to convey primarily the semiotic content of their plastic endeavours, Tatlin was far more concerned with the inherent properties of the materials he used, coupled with their method of construction – usually pieces of wood nailed together or rivetted metal – hence his incessant reference to a "culture of materials" and "real materials" suspended in "real space" (Khan-Magomedov, 1987: 64). Thus, Tatlin had not only repudiated the two-dimensional surfaces from which reliefs projected in the past, but he challenged also traditional concepts of mass and volume, and replaced conventional carving and modelling procedures with novel construction techniques.

Although drawn to Malevich's abstract pictorial vocabulary, Tatlin was not interested in the supposedly transcendental significance of form, but in the propensity of the materials that he was using – often found objects. The "0-10 Exhibition" highlighted this difference in approach, which, according to Moszynska (1990: 73), caused a rift between these two artists that marked the beginning of the ongoing ideological feud between the spiritual and materialist attitudes of post-revolutionary Soviet art and, ultimately, architecture. The artist and sponsor of the "0-10 Exhibition", Ivan Puni (1894-1956), synthesized the approaches of Malevich and Tatlin in his *Suprematist Constructions* (*fig. 9.11*), as did numerous others.

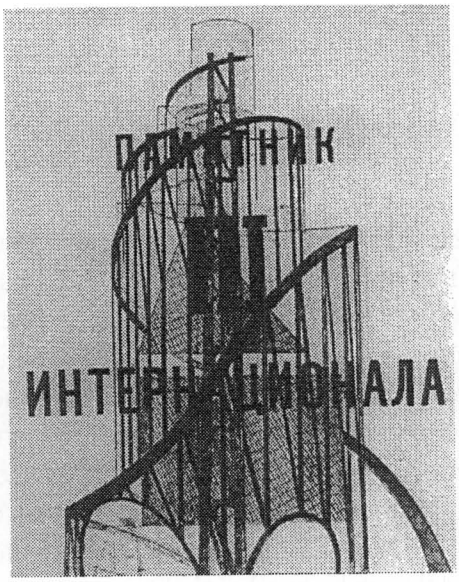
Russian sculptor Naum Gabo (1890-1977) and his half-brother, painter Anton (Natan) Pevsner (1884/6-1962), were also substantially influenced by Cubism and Futurism, which both had been investigated independently since the early 1910s. As Gabo and Pevsner contributed significantly to the spatial component of the ensuing constructivist initiative, their endeavours demand attention. Pevsner had presumably been exposed to Cubism since he moved to Paris in 1911. Gabo, exiled in Norway during the First World War, had been experimenting with synthetic cubist sculptures since 1914. Upon their return to the Soviet Union after the Russian Revolution of 1917, they met Tatlin in Moscow who further informed their creative development in the field of sculpture.

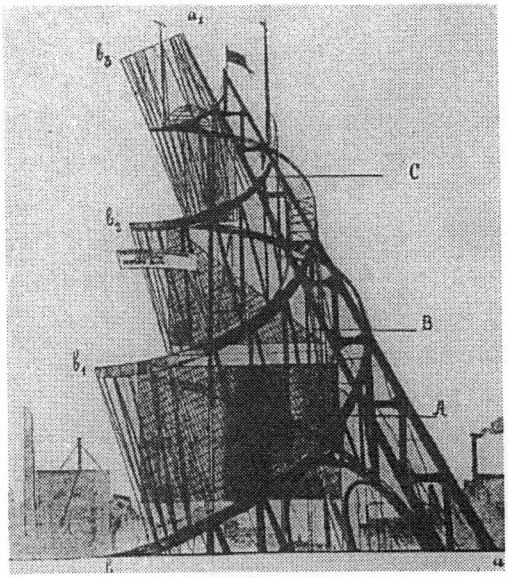
Although Gabo and Pevsner acknowledged their indebtedness to both Cubism and Futurism, they were eminently critical of the fact that neither movement had fully explored its potential, as communicated in their "Realistic Manifesto", published in August 1920 (1968: 326-327):

> "Neither Futurism nor Cubism has brought us what our time has expected of them ... Cubism, having started with simplification of the representation technique, ended with its analysis and stuck there ... the whole Futurist noise about speed is too obvious an anecdote, and from the moment that Futurism proclaimed that 'Space and Time are yesterday's dead' it sunk into ... obscurity ..."

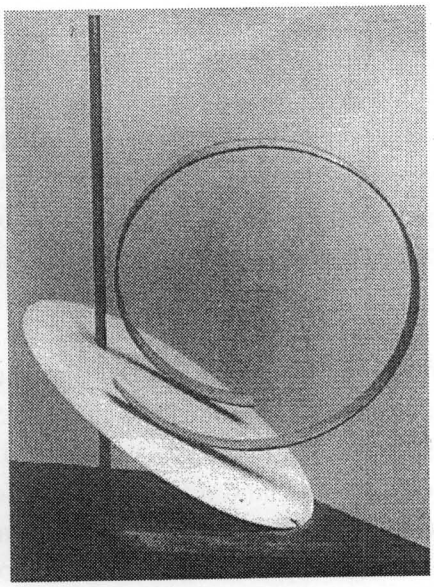
Gabo and Pevsner (*ibid.*: 328-329) also provided one of the most eloquent references to the novel space-time dimension, warranting this lengthy quotation:

> "We say ... Space and time are re-born to us today. Space and time are the only forms on which life is built and hence art must be constructed ... <u>The realization of our perceptions of the world in the forms of space and time is the only aim of our pictorial and plastic art</u> ... We renounce <u>volume as a pictorial and plastic form of space; one cannot measure space in volumes</u>

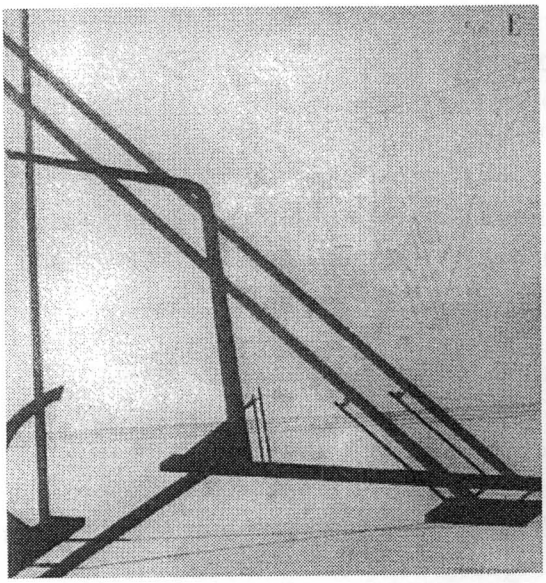




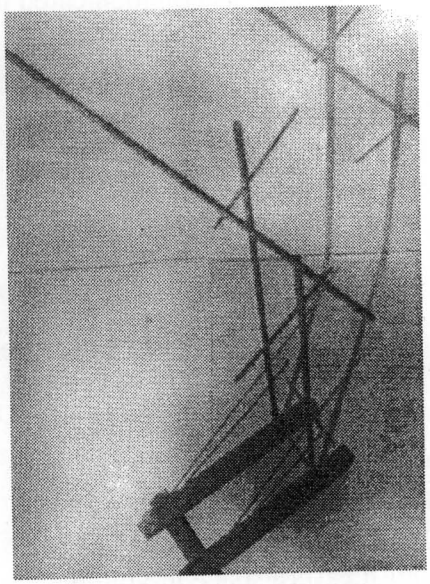
9.16 Tatlin, Monument to the Third International, project (1920).

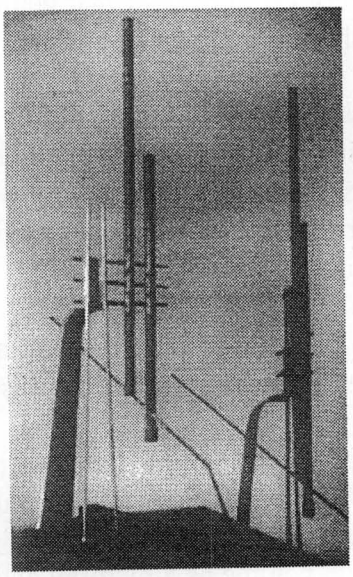


9.17 V. Stenberg, *Construction* (1920).



9.18 G. Stenberg, *Construction* (1921).





depth? We affirm depth as the only pictorial and plastic form of space. We renounce in sculpture, the mass as a sculptural element ... But you as sculptors of all shades and directions, you still adhere to the age-old prejudice that you cannot free the volume of mass. Here ... we take four planes and we construct them with the same volume as of four tons of mass ... We renounce the thousand-year delusion in art that held the static rhythms as the only elements of the plastic and pictorial arts. We affirm in these arts a new element, the kinetic rhythms, as the basic forms of our perception of real time." [Emphasis as quoted.]

These two brothers not only internalized the magnitude of the space-time dimension to an even greater extent than did Boccioni, but it is also vividly demonstrated in Gabo's famous free-standing kinetic sculptures dating from approximately 1920 (*figs 9.12-9.15*). Moreover, Gabo's active interest in the creative possibilities presented by mechanization, found a precedent in Tatlin's rotating architectural structures, [4] precipitating Art and Op Art, dating from the late 1950s and 1960s.

9.5 THE GENESIS OF CONSTRUCTIVISM

9.5.1 Introduction

In addition to his sculptural repertoire, Tatlin developed a corresponding syllabus for academic tuition, teaching from 1918 a novel art course, entitled "Construction, Volume and Material", initially in Moscow and then in Petrograd. This period of consolidation provided him with the opportunity to reflect on the longer-term objectives of his artistic production; presumably, recognizing its worth as preparatory (or so-called laboratory work) for practical implementation. In keeping with many of his generation and coinciding with his interest in materials, Tatlin also eulogized the creative potential of industrial technology and engineered edifices. His example and precepts generated a considerable following, compounded by his highly influential official commission, the Monument to the Third International, excecuted in model format between 1919 and 1920 (*fig 9.16*).

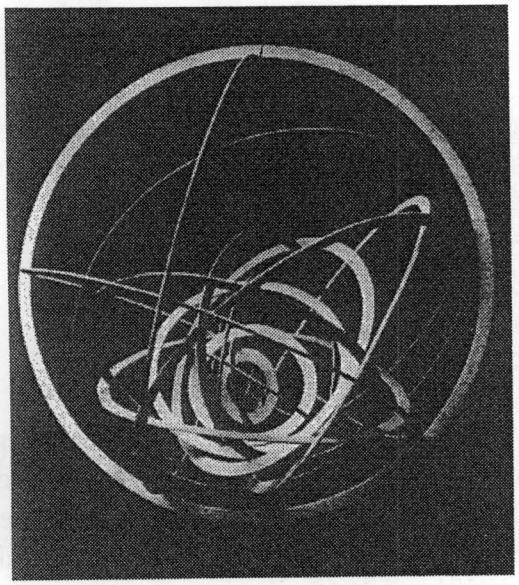
Apart from serving as the most vivid expression of Boccioni's call for a dynamic, spiral architecture, the Monument to the Third International marked the transition from pictorial and sculptural concerns to utilitarian preoccupations. Furthermore, it symbolized the dawn of the modern era in the Soviet Union, and the genesis of Constructivism. [5]

Besides a banner reading "Engineers Create New Forms" that accompanied the exhibited model in Petrograd and Moscow in November and December 1920, respectively, Tatlin and his three assistants – painters Pavel Vinogradov (q.v.) and Iosif Meerzon (1900-1941) and sculptor Tevel Shapiro (1898-q.v.) – published a brief newspaper statement, entitled "The Work that Faces Us". They informed their readers of the seminal role of Tatlin's reliefs in the monument's realization and, more specifically, in honing his material, technological and spatial sensibilities (Cooke, 1989a: 24).

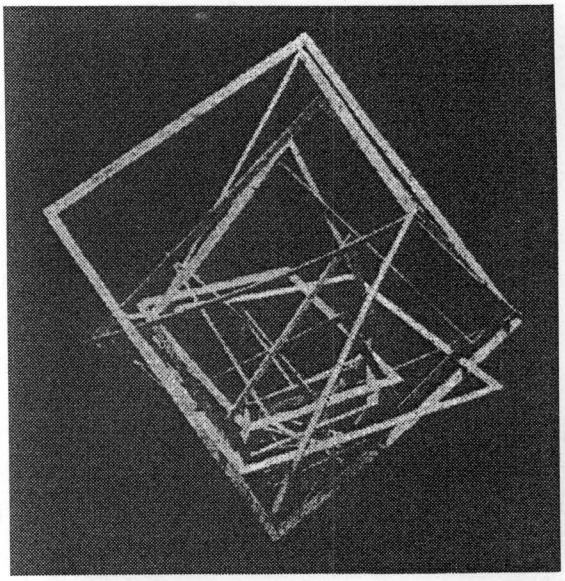
---

4 It is not clear whether Gabo's interest in motorized, kinetic constructions informed the rotating structures of Tatlin's Monument to the Third International, or vice versa. However, there is little doubt that Tatlin's pioneering kinetic reliefs contributed to Gabo's preoccupation with motion – apart from the dynamic, but physically static, examples of Futurism.

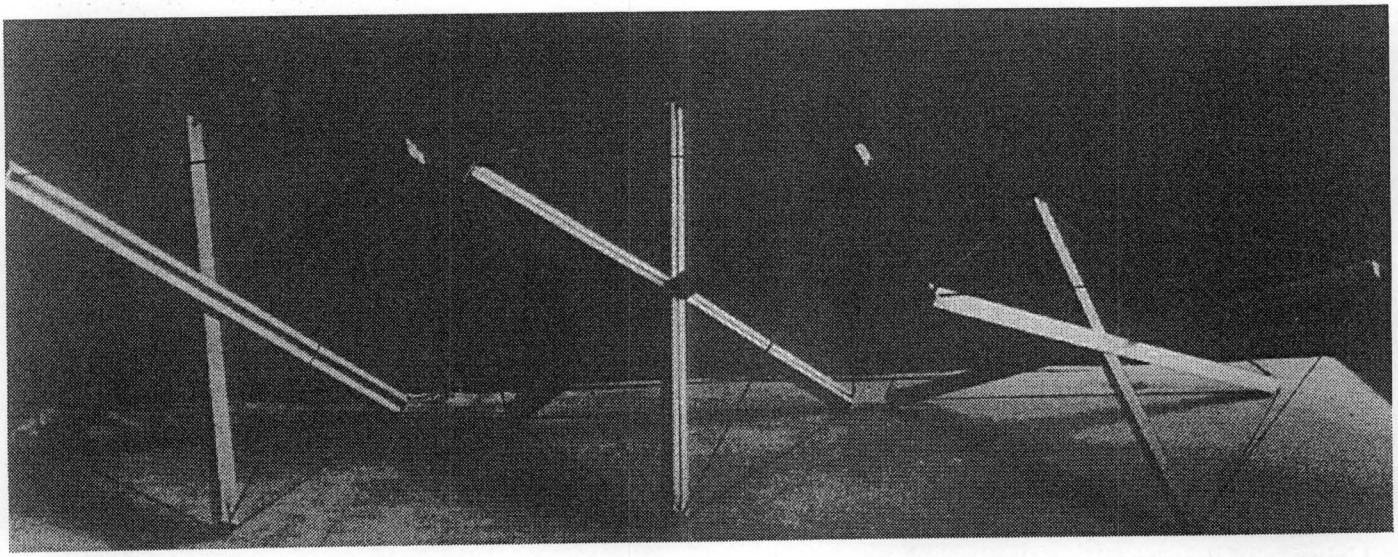
5 Although the Monument to the Third International served, in retrospect, as the first example of Constructivism, the term itself is said to have enjoyed currency only since the founding of the aesthetic initiatives by the so-called Constructivists of the World in January 1921. However, Kahn-Magomedov, S., 1987, *Pioneers of Soviet Architecture – The Search for New Solutions in the 1920s and 1930s*, trans. Lieven, A. (New York: Rizzoli), 149, maintains that "undiscovered [evidence] may push this date back to 1920, or even 1919". Scharf, A., 1966, "Constructivism", in Stangos (ed.), 1991 ed., *Concepts of Modern Art*: 167, refers to a painting by Malevich, entitled *Suprematist Destroyer of Constructivist Form*, dated 1916 and aimed specifically at Tatlin's abstract counter reliefs. If the dating of Malevich's painting is accurate, then the term "Constructivism" has been in circulation for a longer time than inferred to by Khan-Magomedov.



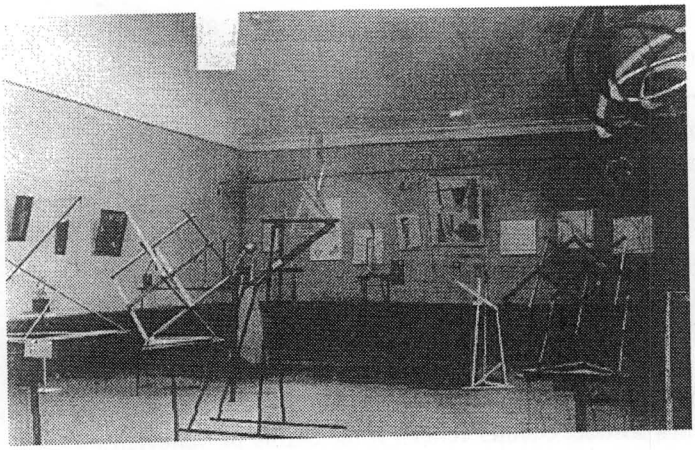
9.21 Rodchenko, *Spatial Construction* (1921).

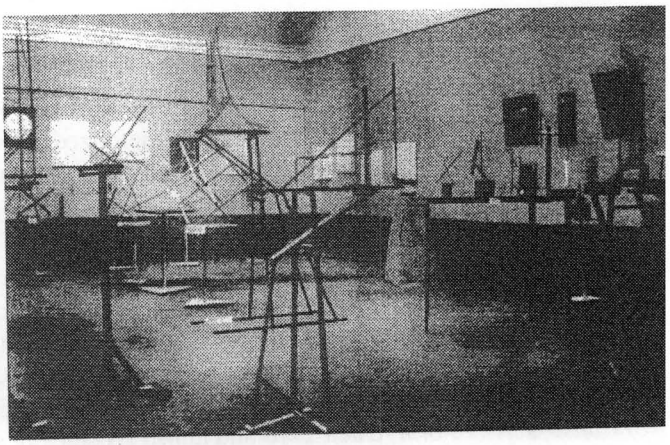


9.22 Rodchenko, *Spatial Construction* (1921).



9.23 Ioganson, *Spatial Construction* (1921).





9.24 Vintage photograph of the *OBMOKhU Exhibition*, Moscow (1921): Stenberg, Medunetsky, Ioganson and Rodchenko.

In this article, they drew attention to the methodological connection that exists among the pictorial, plastic and utilitarian arts, calling for the infusion of aesthetic preoccupations with functional significance:

> "In this way an opportunity emerges of uniting purely artistic forms with utilitarian intentions ... The results are models which stimulate us to inventions in our work of creating a new world [and which] call upon [us] to exercise control over the forms encountered in our new everyday life." (Cooke, 1989a: 24)

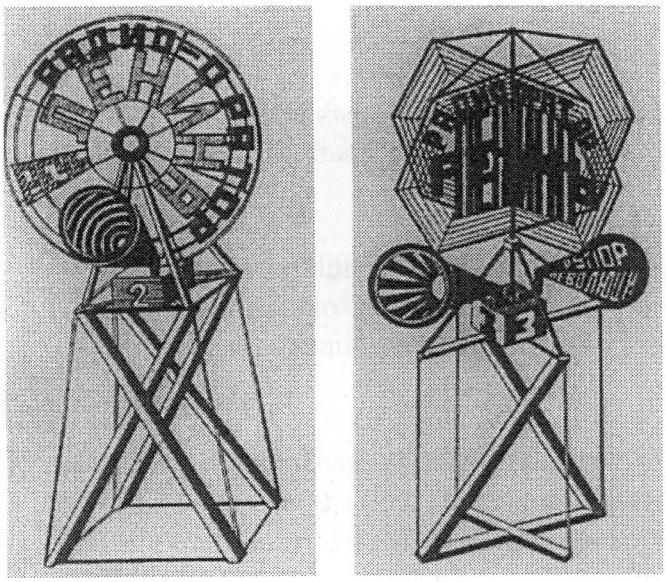
They also regarded 'non-functional' art valid only in so far as it served as preparation for utilitarian implementation. This premise coincided with the Marxist ethos of production, and contributed substantially to the politicization of art – all views that had already been in circulation for some time. The controversial poet and one of the earliest Russian Futurists', Vladimir Mayakovsky (1893-1930), and the so-called Leftist author and literary critic Osip Brik (1888-1945), amongst others, had been promoting the idea of the democratization of art in a series of articles published since 1918.[6] Although Tatlin's views must have been informed by the theoretical tenets of these authors, the Monument to the Third International was its earliest physical manifestation. As a result, this structure, and the premises on which it was founded, served as a fitting response to the socialist agenda of the post-revolution Soviet Union, securing Tatlin's pioneering role in the emergence of the contentious constructivist movement.

9.5.2 Spatial Construction (1921)

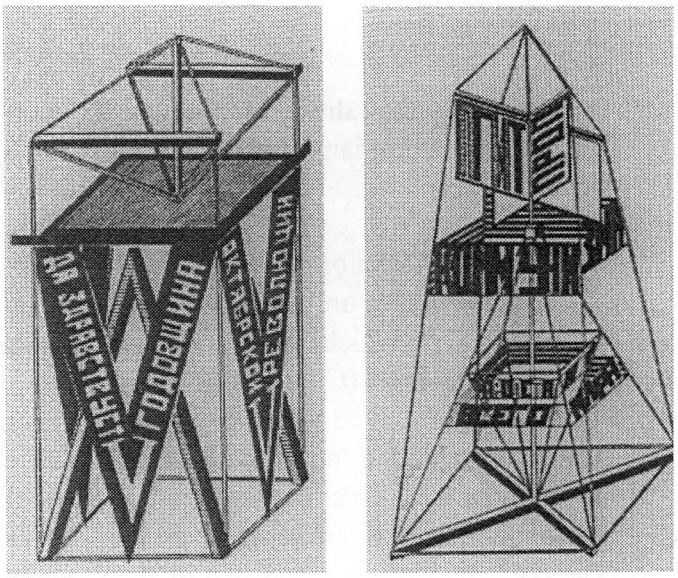
Tatlin's summons to imbue aesthetic preoccupations with utilitarian significance was responded to first by his former students, Vladimir Stenberg (1899-1982) and his brother Georgii (1900-1933), and Kazimir Medunetsky (1899-1934), of the so-called OBMOKhU Group (Society of Young Artists). In January 1921 they proclaimed themselves the "Constructivists of the World". Their initial pictorial compositions and relief constructions were surpassed by so-called spatial constructions (*figs 9.17-9.20*), excecuted in a diverse range of industrially produced materials – standard steel profiles, glass, wire, brass pipes and so forth – and assembled in accordance with basic engineering techniques. Regarded as prototypes for utilitarian purposes, these structurally daring, though immobile, constructions served as the quintessential expression of the modern age. On the authority of Khan-Magomedov (1987: 65), the Stenberg brothers inferred that artistic invention based on elusive aesthetic principles had been transcended by technical efficiency, dictated by rationality and material propensities. Presumably informed by the preoccupations of both Gabo and Pevsner with regard to the dematerialization of mass and volume, the Stenbergs recognized that space can, instead of the fragmentation of hermetic form, also be emphasized by means of open-ended lattice frameworks and girders – structural features that in due course became synonymous with a constructivist design vocabulary.

---

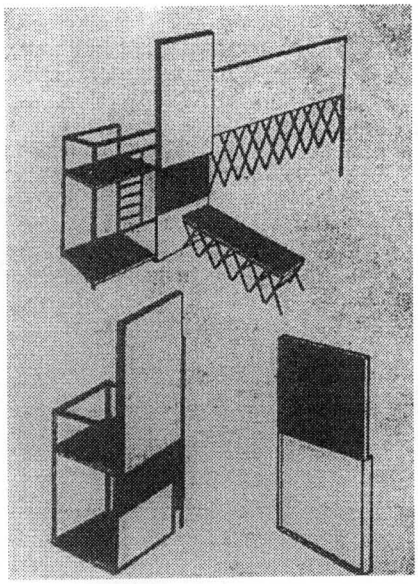
6 According to Khan-Magomedov (1987: 62), the article "Decree No. 1 Concerning the Democratization of Art", *Gazeta Futuristov* (Futurist's Gazette, Moscow), dated March 1918, by Mayakovsky, Valentin Kamensky (1907-1975) and one of the two brothers Burlyuk – either David (1882-1967) or Nikolai (1890-1920) – was the first on the topic. These authors insisted that modern art be brought to "the people" and they implored artists to "seize their paintpots and use the brushes of their trade to illuminate and bedeck all the flanks, foreheads and breasts of cities and stations, and the endlessly running flock of railroad trucks. From now on, the citizen will at every moment savour the profound thinking of his great contemporaries, contemplate the colourful brilliance of today's joyful beauty..." Similar views were expressed by Brik, leftist author Boris Kushner (1888-1937) and artist and art historian Nikolia Punin (1888-1953) in a series of articles published in the periodical *Iskusstvo Kommuny* (Art of the Commune, Moscow) between December 1918 and April 1919. According to Khan-Magomedov (*ibid.*: 146-147), these authors were adamant that the purpose of art was not to decorate life, but to "shape" it. All artists were summoned to produce useful items, giving rise to the notion of so-called Production Art.



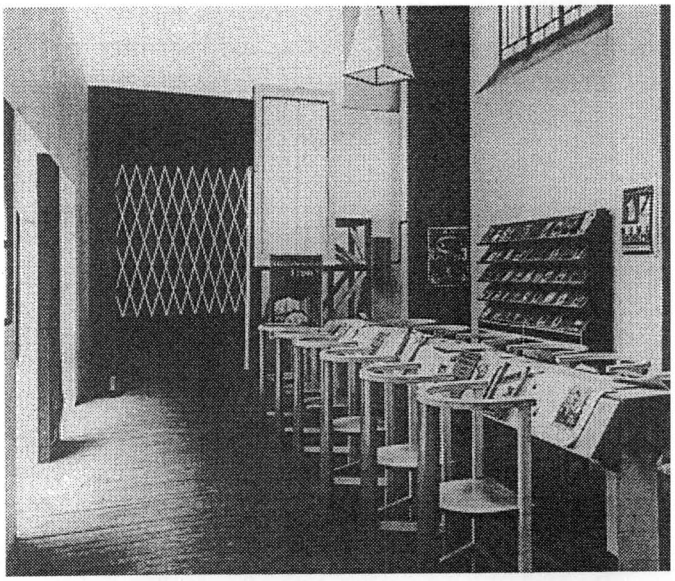
9.25 Klutsis, Agitational Loudspeaker Stands (1922).



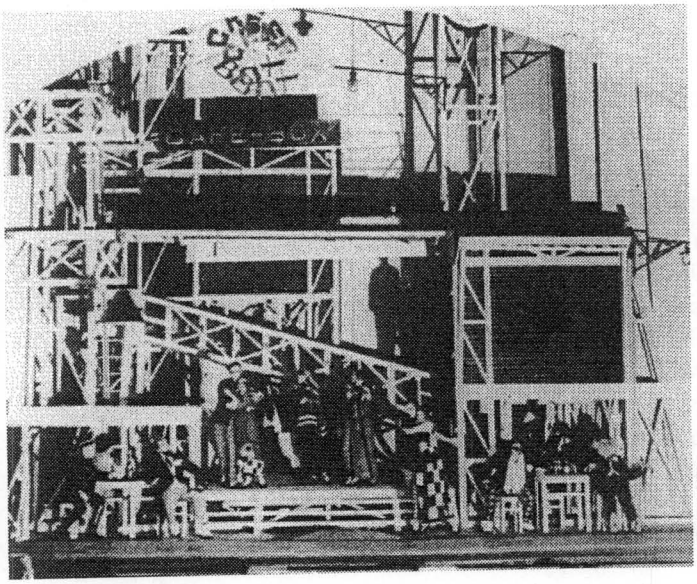
9.26 Klutsis, Speaker's Platforms (1922).



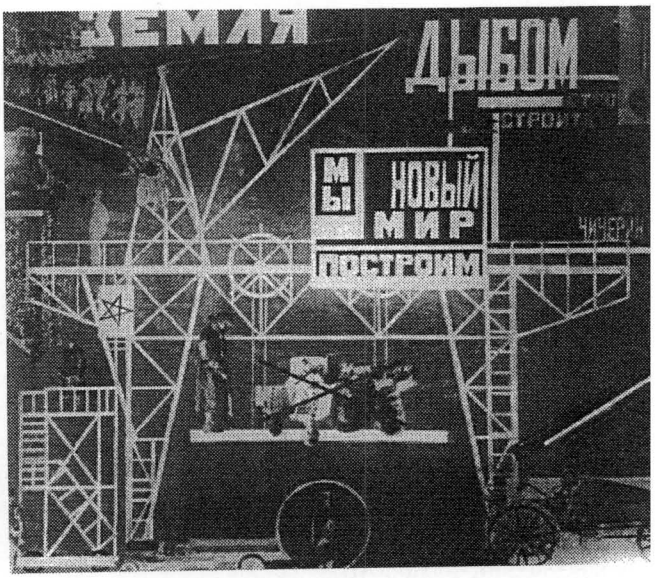
9.27 Rodchenko, Collapsable Worker's Furniture (1925).



9.28 Rodchenko's Furniture in Melnikov's USSR Pavilion, *Exposition Internationale des Arts Décoratifs*, Paris. (1925).



9.29 A. Vesnin, stage-set, *The Man who was Thursday*



9.30 Popova, stage-set, *The World Upside Down*

In March 1921, these pioneering artist-technicians were joined by Rodchenko, his wife Varvara Stepanova (1894-1958), Alexei Gan (1895-1940) and Karel Ioganson (c. 1890-1924) to constitute the "First Working Group of Constructivists". Rodchenko's collapsable constructions (*figs 9.21-9.22*) added another dimension to these highly innovative spatial and structural explorations. The resultant dynamic constructions signalled an advance from two-dimensional investigations to independent three-dimensional explorations with their own inherent plastic laws (*figs 9.23-9.24*). Kahn-Magomedov (1987: 66) notes:

> "... it was no longer a matter of a painter enthralled by the interaction of open spatial compositions, but of a constructor in search of new methods of design and the opportunities made available by the structuring of space ... Malevich first depicted volumes in a plane and then transferred them into space. Tatlin may be said to have translated the illusion of plasticity in a Cubist picture into a three-dimensional object. The Stenbergs and Medunetsky first sketched out their constructions in a plane and then carried them out in space. Rodchenko, however, literally converted the picture surface into a three-dimensional composition without adding anything to it."

Fully aware of the utilitarian potential of their novel spatial constructions, the laboratory work of these early Constructivists served as one of the most significant advances to modern architecture.

9.5.3 Constructivist Production (1921-1923)

Although relishing in the spatial, kinetic and tectonic possibilities assimilated via the Cubists, Futurists, Tatlin and Gabo, the pioneering Constructivists developed, from the onset, a highly politicized rationale for their creative investigations. Declaring "Scientific Communism" (based, ideologically and literally, on dialectical materialism) to be their "sole premise" (Cooke, 1989a: 24), they aimed at forging a synthesis between political dogma, industrial technique and plastic resolution in order to affect the entire spectrum of aesthetic disciplines. As Gan, the most prominent theoretical exponent of the early Constructivists, noted in his controversial book *Konstruktivizm* of 1922:

> "It is essential to channel [our] work into a definite system; to create disciplines through which all Constructivists' experimental work can be directed ... the primary objective [must be] to establish a scientific foundation for the approach to constructing buildings and services that could fulfil the demands of Communist culture ..." (*ibid.*: 24-25)

Gan's views coincided with those of Brik, Boris Kushner (1888-1937) and Boris Arvatov (1896-1940) – the major proponents of so-called Production Art. However, Brik, Kushner and Arvatov were mere ideologists and it was ultimately the Constructivists who put theory into practice. In keeping with the utilitarian agenda of Constructivism, the exploratory spatial constructions were soon adapted for practical implementation.

The suprematist artist Klutsis was one of the first to combine the novel structural vocabulary with Rodchenko's mobile and convertible principles in his designs of a series of items for agitational purposes, such as, Speaker's Platform (1922, *fig. 9.25*) and Agitational Loudspeakers for Public Holidays (1922, *fig. 9.26*). Rodchenko followed suit with his flexible and multi-purpose pieces of furniture – some of which were exhibited in Melnikov's famous USSR Pavilion at the "Exposition Internationale des Arts Décoratifs" in Paris in 1925 (*figs 9.27-9.28*). The renowned stage sets designed from 1922 by Lyubov Popova (1889-1924) and Alexandr Vesnin (1883-1959), amongst others, provided a suitable vehicle for concretizing these initial structural experiments, whilst satisfying the requirements for conveying propagandist messages (*figs 9.29-9.30*). The extended *œuvre* of these multifariously talented artist-artist-technicians (or "productionists") is legendary. They are noted also for the original contributions they made to cinematography, the applied and graphics arts, and fashion design.

However, before reviewing the architectural component of Constructivism, attention is directed to concurrent aesthetic initiatives that played an equally important role in the evolution of modern Soviet architecture.

9.6 VOLUMETRIC SUPREMATISM (1919-1935)

The volumetric stage of Suprematism cannot be divorced from the political climate in the Soviet Union during the tumultuous 1920s. The evolution of Malevich's artistic career, in particular, serves as a fitting barometer of the circumstances prevailing at the time.

After producing his notorious *Suprematist Composition: White on White*, Malevich ventured into academia in 1919 at the invitation of the head of the School of Art in Vitebsk, the idiosyncratic artist Marc Chagall (1887-1985). Upon Chagall's resignation soon after Malevich's arrival, [7] he became director of the school – a position he held until 1922.

Apart from the fact that Malevich had exhausted his painterly repertoire, his change of direction must have been due to the increasing stigmatization of the fine arts. Ironically, its redundancy was not instigated by the authorities but by the staunch, if not somewhat fanatical, proponents of Constructivism.

As early as 1916, Malevich launched a personal attack on Tatlin with his, rather out of character, painting *Suprematism Destroyer of Constructivist Form* (unwittingly setting the stage for the adoption of the suprematist vocabulary for propagandist purposes). Malevich's adamant insistence that the objective of art is to hone spiritual awareness did not curry favour in an atheistic context and inevitably opened him up to criticism. Three years later, at the "10th State Exhibition", Moscow, Rodchenko launched a counter-attack on the metaphysically-inspired *White on White* with his pernicious *Black on Black*, intended to symbolize the death of Suprematism – albeit prematurely and at a stage when Malevich had already directed his energies elsewhere. The demise of fine arts was consecrated at the famous "5x5=25 Exhibition", hosted in Moscow in 1921, where Rodchenko exhibited his "last paintings" and ceremoniously announced that "representation is finished: it is time to construct" (Moszynska, 1990: 76). Gan added fuel to fire with his declaration in 1922 of an unconditional war on fine art in *Konstruktivizm*, rightfully observing that for art to be associated with theological and metaphysical premises was irreconcilable with Marxist doctrine.

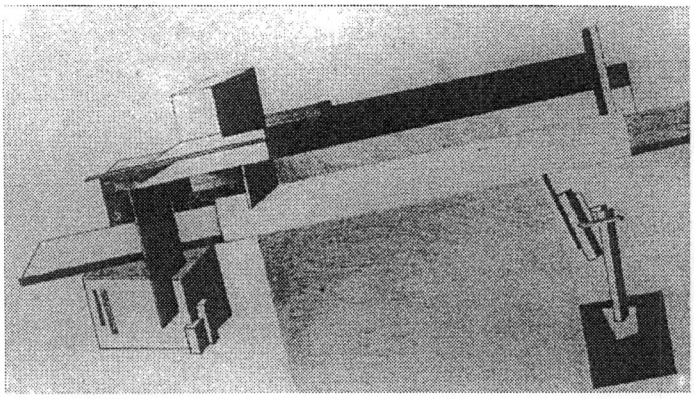
Consequently, Malevich's advance into the three-dimensional can be attributed to mounting political pressure rather than logical consequence. He succumbed, and contrary to his own contentions, [8] to the utilitarianism promoted by the Constructivists. Yet, Malevich (1927; 1968: 346) justified his change of heart as follows:

"Suprematism has opened up new possibilities to creative art, since by virtue of [the] abandonment of so-called 'practical consideration', a plastic feeling rendered on canvas can be carried over into space. The artist (painter) is no longer bound to the canvas (picture plane) and can transfer his compositions from canvas to space." [Emphasis as quoted]

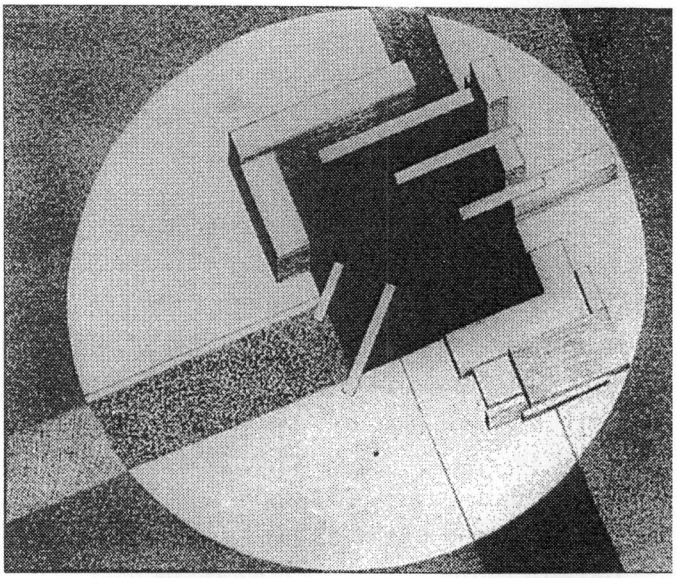
---

7 See the autobiography, Chagall, M., 1995 ed., *Marc Chagall My Life* (New York: Orion) for his recollections of the political conflicts in the artistic arena during the early 1920s in the Soviet Union.

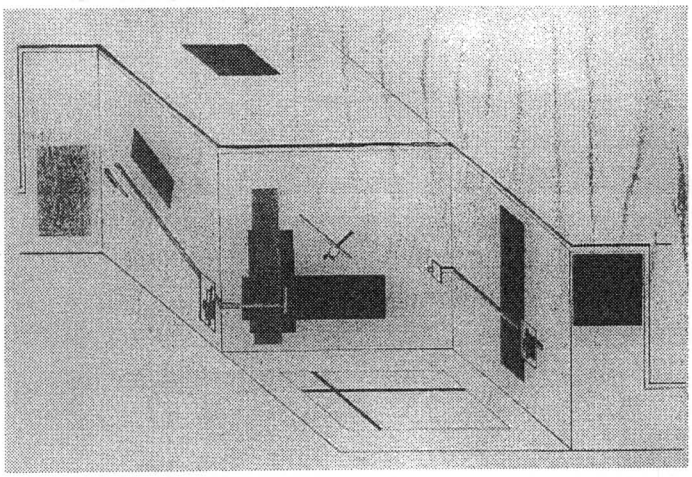
8 Malevich's statements and actions are riddled with contradictions. On the one hand, Lodder, C., 1982, "The Kostakis Collection: New Insights into the Russian Avant-garde", *AD*, vol 53, no. 5/6: 21, mentions that Malevich addressed a letter to one Kudriashev, dated December 1920, informing him that Suprematism had to adopt a more "constructive attitude". He also encouraged his students to participate in the reconstruction of society. On the other hand, he own writings are replete with attacks on utilitarianism and political perscriptiveness.



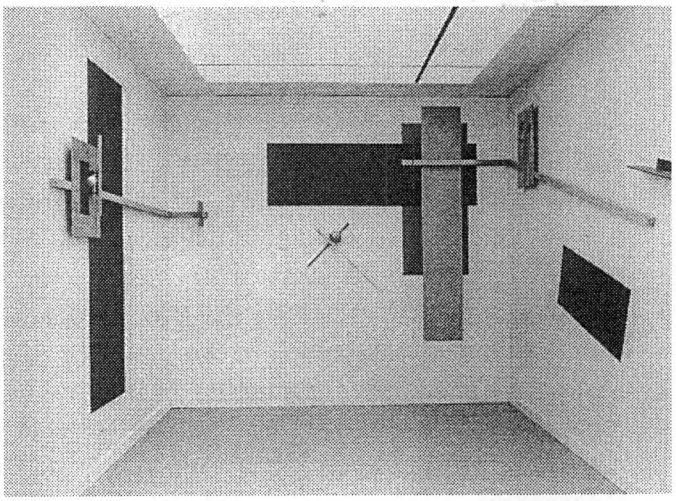
9.31 Lissitzky, *Proun – Bridge* (1921).



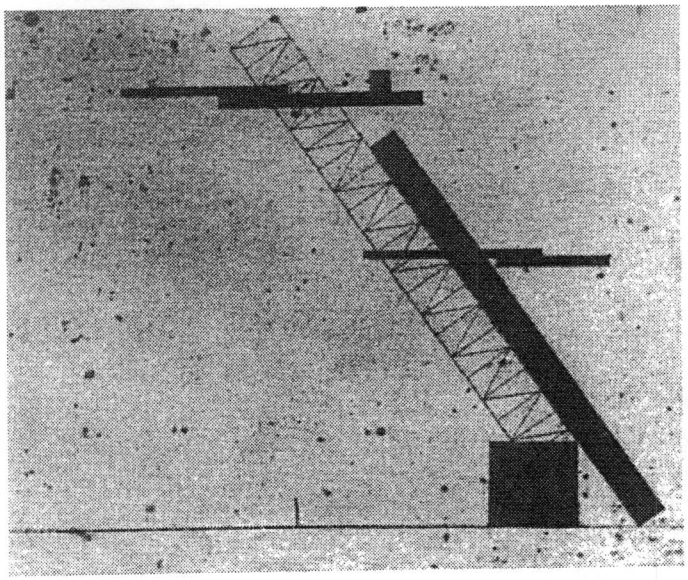
9.32 Lissitzky, *Proun – City* (1921).



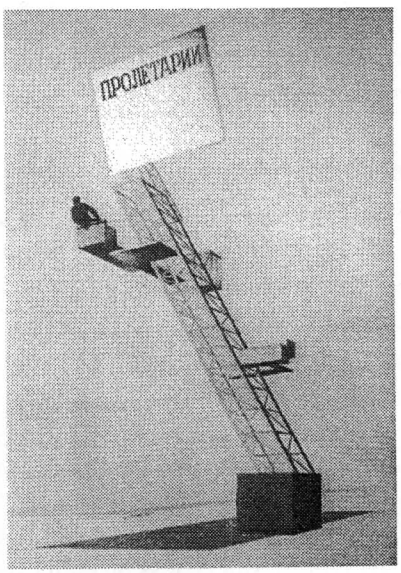
9.33 Lissitzky, Proun Room (1923).



9.34 Lissitzky, Proun Room, *Grosse-Berliner Kunstausstellung* (1923, reconstruction).



9.35 Student project, Vitebsk School of Art



9.36 Lissitzky, Lenin Tribune, project (1924).

Notwithstanding, Volumetric Suprematism contributed significantly to the crystallization of a constructivist design idiom, initiated by Lissitzky who headed the design and architectural studios at the Vitebsk School of Art (renamed Vitebsk Artistic and Practical Institute). Although Lissitzky never ascribed to the metaphysical premises of Suprematism and was ideologically closer to the Constructivists, he was the first architect to fully recognize the compositional worth and latent volumetric potential of Suprematism, which he explored via his renowned Prouns (Projects for the Affirmation of the New). His Prouns, commenced with in 1919, preceded the first spatial investigations of the early Constructivists by two years. From the onset, these orthographic projections of complex suprematist compositions displayed distinct architectural characteristics, as suggested by the following titles: *Proun – Bridge* (1920-21, *fig. 9.31*), *Proun – City* (1920-21, *fig. 9.31*) and *Monument within a Circle* (1920-21).

Like Tatlin, Lissitzky regarded his volumetric investigations as preparatory explorations for real architectural commissions, which Kahn-Magomedov (1987: 63) refers to as "a compositional stock-piling for later use". The Prouns dominate as formal and planar studies of different compositional arrangements, and in which the difference between mass and volume was investigated. Noted for his graphic skills, Lissitzky carefully considered the compositional distribution of the respective suprematist forms, but it is not clear whether this went beyond intuitive experimentation. Inspired by Malevich's painterly example, Lissitzky was also interested in the dynamics created by defying the orthogonal, but he never subscribed to the mobile antics of Tatlin, Gabo and Rodchenko.

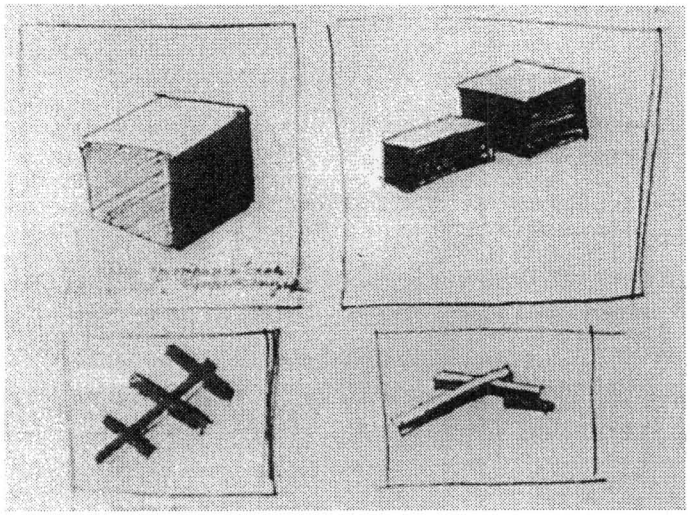
In addition to beautifully crafted drawings, Lissitzky produced three-dimensional corner reliefs. He also mimicked Malevich's approach of emphasizing the corner, not for symbolical purposes but to amplify the spatial revelations engendered by Cubism. By extending the boundaries of his suprematist reliefs across the room, the customary definition of the different planar surfaces were obscured, and the continuation of space was emphasized. These plastic qualities, prominently displayed in his so-called Proun Room at the "Grosse-Berliner Kunstausstellung" of 1923 (*figs 9.33-9.34*), served as precedent for the interiors designed by Van Doesburg and also influenced the Mies's architecture of 1920s and 1930s.

Lissitzky's embrionic studies stood him in good stead as demonstrated by his proposal for the Lenin Tribune (1924, *fig. 9.36*) in which the emblematic diagonal is boldly expressed in the third dimension. Lissitzky's skillful synthesis of suprematist forms, innovative compositional organization and structural daring created a memorable record of pioneering Soviet architecture.

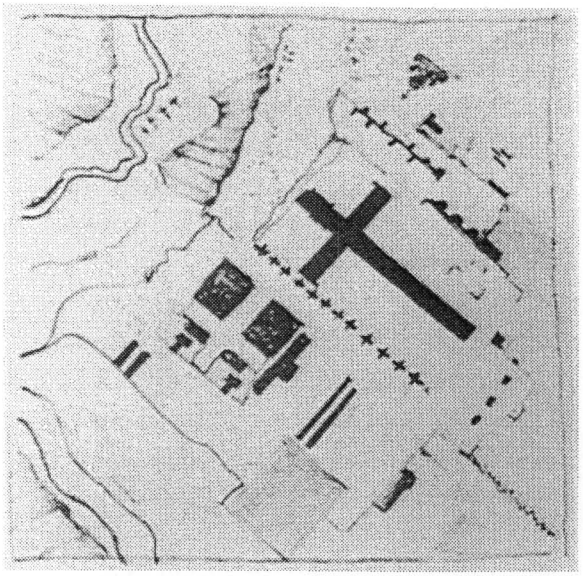
Malevich followed suit with his horizontal and vertical Arkhitectons [Arkhitectoniks] and utopian proposals for dwellings, entitled Planits, commenced with from approximately 1923. [9] His initial extrapolations of basic suprematist forms (*fig. 9.37*) were surpassed by complex volumetric modulations that were mostly executed in model format (*figs 9.39-9.41*). Despite their complexity, these volumetric modulations are static, and far less planar and spatial than Lissitzky's Prouns – exemplary, rather, of what American author Francis Ching (1979: 72) would term as studies in "additive form". With rare exceptions (*fig. 9.38*), Malevich chose not to explore the footprints of any of his dynamic suprematist compositions, as Lissitzky had done. Instead, he concentrated on the inexhaustible permutations of mass – precipitating the brutalist architecture of the late 1950s. As Khan-Magomedov (1987: 64) rightfully observes:

---

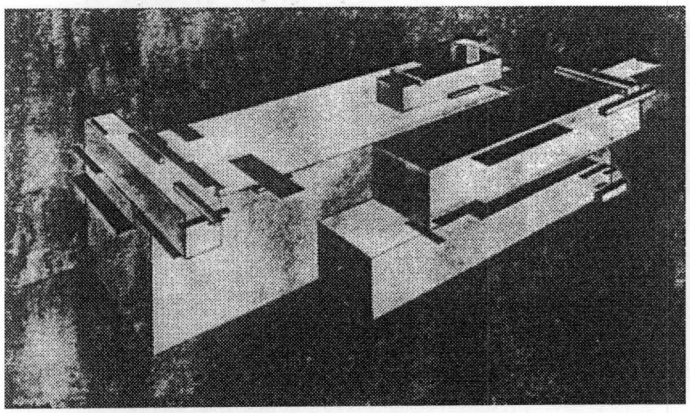
9 It is noteworthy that Malevich only started to conduct three-dimensional investigations, following Lissitzky's example, once he had left Vitebsk for Leningrad (former Petrograd / St Petersburg).



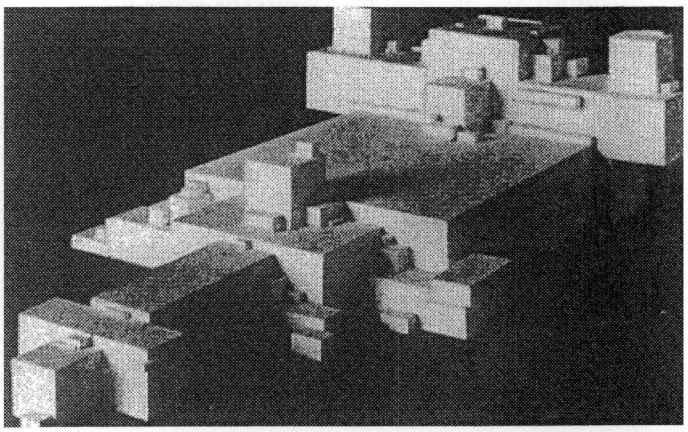
9.37 Malevich, *Diagramme for the Development of Volumetric Suprematism* (1923).



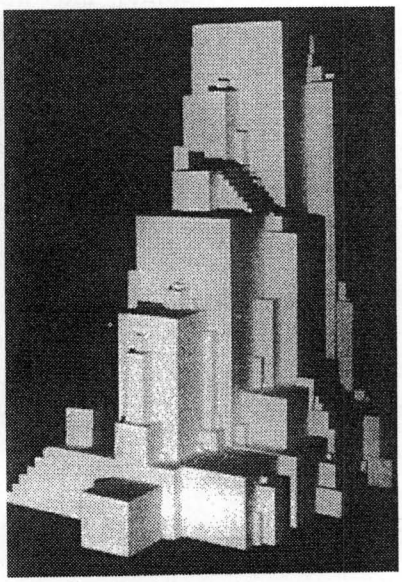
9.38 Malevich, *Aerial View of Suprematist Composition* (n.d.).

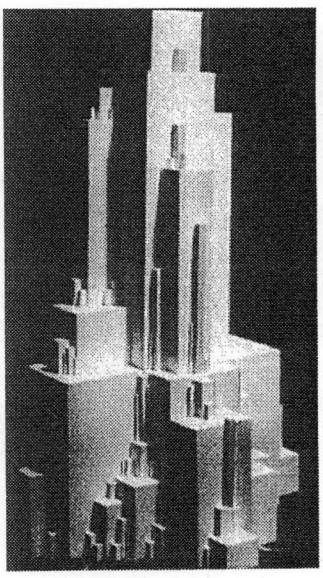


9.39 Malevich, Arkhitecton (1923).



9.40 Malevich, Horizontal Arkhitecton (1923).





> "As a painter, Malevich helped architects to see plain geometric shapes afresh and revealed the virtually inexhaustible opportunities for their combination in effective and complex spatial compositions."

Malevich, too, referred to his architectural explorations as spatial constructions, but formal constructions serve as a more appropriate description, especially when compared to those kinetic, spatial constructions produced by the Constructivists. Notwithstanding, both Lissitzky and Malevich introduced new plastic concepts to architecture and played pivotal roles in the transition from fine arts to architecture. Khan-Magomedov (*ibid.*) concurs:

> "The juxtaposition of volumes in Malevich's architectonic compositions and Lissitzky's Prouns generated relationships and devices seldom or never before used for architectural purposes: the horizontal and vertical displacement of volumes relative to each other; overhangs of one volume over another; the siting of a large and bulky inchoate shape over smaller scattered ones; the soaring into space of a large volume supported only by a small area of its lower surface, and so on. A negation of symmetry, a fresh approach to gravity – the visually 'weighty' above the apparently 'light' – the rich opportunities offered by light and shade, contrasting differences of scale, the constantly changing of general spatial composition as an object is viewed in the round from every angle – all this gave an architect new means of achieving effects substantially different from those of traditional architecture ..."

It is noteworthy that ever since Malevich imbued Suprematism with distinct utilitarian connotations, he had regained credibility amongst his peers, but he never swayed from his conviction that aesthetic considerations surpassed all else. He also remained totally committed to artistic autonomy and repudiated any connection between art, science and technology (Scharf, 1966; 1991: 138-140). Malevich (1927; 1968: 346) was adamant that practicality *per se* was relative and had a limited life span, whereas art based on absolute values was timeless:

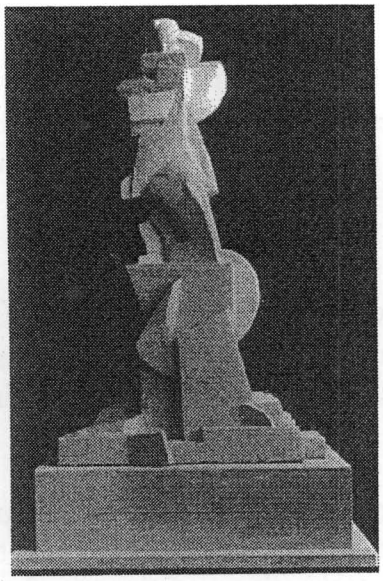
> "... the chronic failure of everything utilitarian ... is gauged by ... this measuring stick [that] is variable in the highest degree. In light of this, all works which, at present, are a part of 'practical life' or to which practical life has laid claim, are in some senses devaluated. Only when they are freed from the encumbrance of practical utility (that is when they are placed in museums) will their truly artistic, absolute value be recognized ... It cannot be stressed too often that absolute, true value rises only from artistic, subconscious, or superconscious creation."

Surprisingly, Malevich was left in peace by the authorities. He continued to teach, but with diminishing importance until his death in 1935. He was buried in a suprematist tomb – the only design of his ever excecuted.

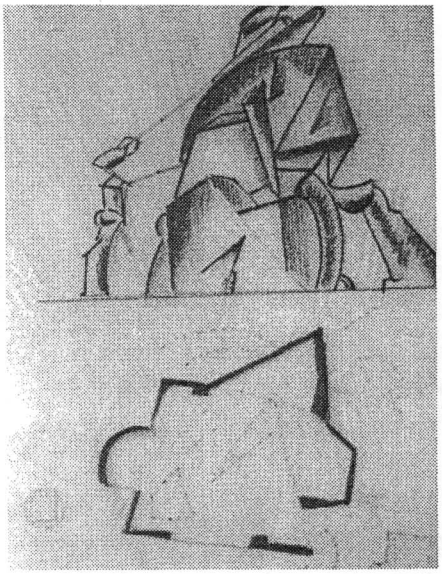
9.7 SYMBOLIC ROMANTICISM (1919-1923) AND SOVIET RATIONALISM (1919-1932)

Significantly, the earliest multi-disciplinary initiative in the Soviet Union that explored the connection between the plastic arts and architecture was pursued by Sinskulptarkh (Commission for the Resolution of Questions Bearing on the Synthesis of Sculpture and Architecture), founded in May 1919 in Moscow, and chaired by cubist sculptor Boris Korolev (1885-1963).

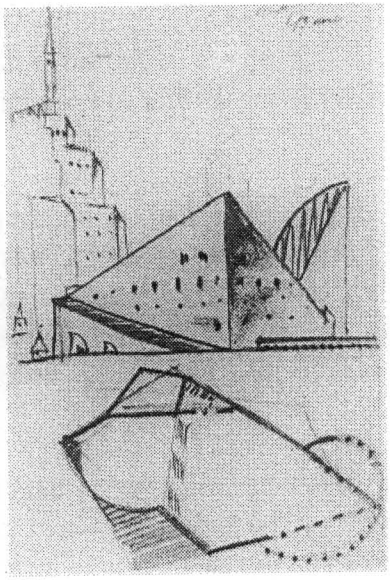
Korolev had for several years been employing the analytical procedures of Cubism in a series of figurative sculptures (*fig. 9.42*). His sculptures increasingly started to display distinct architectonic characteristics. Evidently, this architectural inclination prompted the joint effort between himself and seven architects, including, Nikolai Ladovsky (1881-1941), Vladimir Krinsky (1890-1971) and



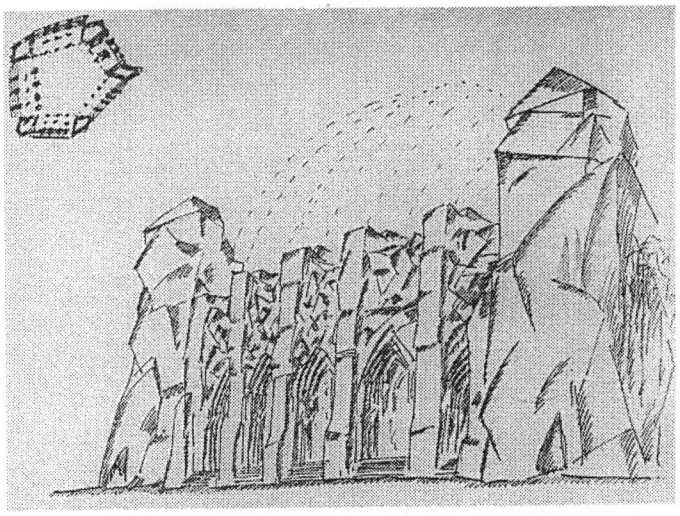
9.42 Cubist sculpture: Korolev, *Karl Marx Monument* (1919).



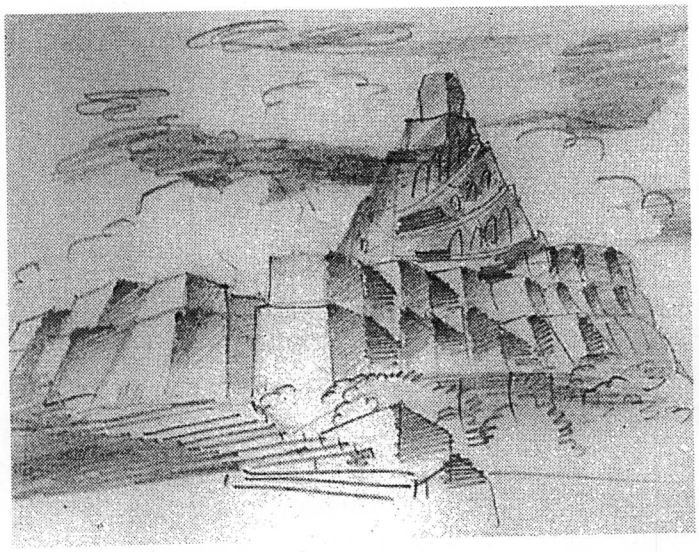
9.43 Korolev, Experimental Architectural Design, project (1919).



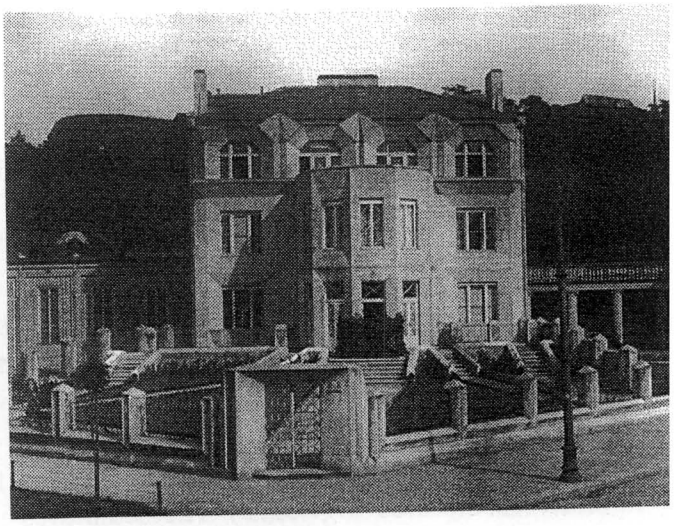
9.44 Ladovsky, Temple for a Communion between Nations, project (1919).



9.45 Iatelov (q.v.), Temple for a Communion between Nations, project (1919).



9.46 Dombrovsky (q.v.), Temple for a Communion



9.47 Chochol, Villa below Vysehrad,

Fidman (1887-1950) – all of whom had rejected past design premises and were anxiously searching for a new semantic approach to architecture. Like their counterparts abroad, Soviet architects were committed to find new means of architectural expression, compounded, in their instance, by the Russian Revolution and the political stigmatization of Classicism.

It is not exactly clear how the short-lived Sinskulptarkh (later known as Zhivskulptarkh – Commission for the Synthesis of Painting, Sculpture and Architecture – before its dissolution in 1920) operated, [10] but Korolev evidently offered tuition in the principles of "plastic composition". This interdisciplinary collaboration resulted in a peculiar combination of geometric and biomorphic modulations (*figs 9.43-9.44*), emblematic of a supposedly rationalist approach to modern architecture that was formulated by Ladovsky. Even more bizarre was the manner in which the cubist method of volumetric fragmentation had been applied to Gothicism and various other archaic styles. This idiosyncratic design approach was pursued by exponents of the other contemporaneous architectural trend, entitled Symbolist Romanticism and led by Iliya Golosov (1883-1945, *figs 9.45-9.46*).

Examination of these early projects produced under Korolev's influence reveals that only the formal aspects and the reductive methodology of Cubism were emulated, and that an intrinsic understanding of the conceptual significance of space was clearly lacking. This is particularly evident when these projects are compared to the spatial compositions of the early Constructivists. By contrast, the Constructivists had grasped that mass and volume could, instead of faceting form, be suggested by different and, specifically, illusionary means.

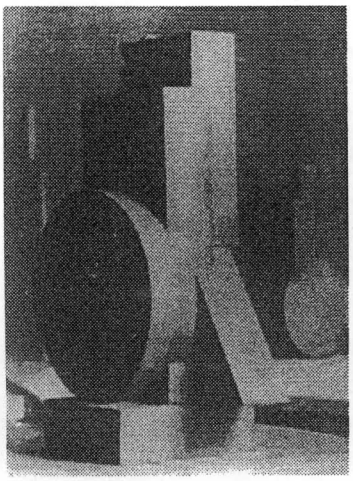
As has been mentioned before, the analytical stage of Cubism had, and in addition to Maison Cubiste, also served as design precedent to the contingent of Czechoslovakian architects from the Graphic Artists Group since 1912 (*fig. 9.47*). It is uncertain whether either of these architectural investigations informed the Soviet initiatives, although they all shared a mutual preoccupation with form. However, as endorsed by Weston (1996: 71), the plastic worth of Cubism did not lay in a faceted formal treatment, but in the cognition of space – the predetermined modulation of space instead of form.

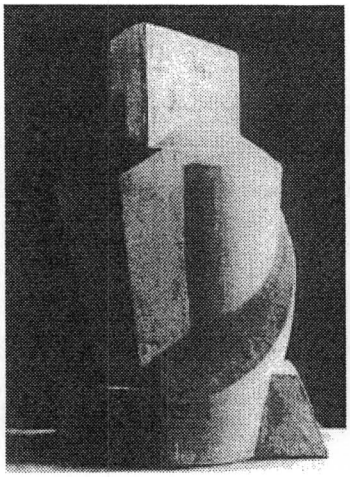
The Symbolic Romantics were particularly concerned with a 'heroic', though dynamic, architecture that drew heavily on past stylistic models, combined with Korolev's plastic design methodology. Specific forms, such as, spirals and pyramids, featured prominently and were pregnant with symbolism. Golosov was also responsible for elaborate theories on the attainment of visual dynamics in architecture – both literally and formally – and on the distinction between mass and form (Khan-Magomedov, 1987: 102-105). In time, the principal tenets of Symbolism Romanticism were assimilated by the Rationalists.

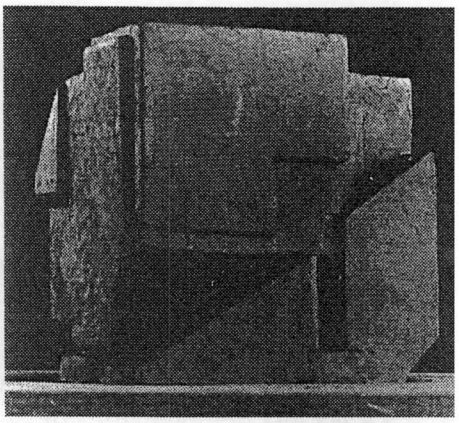
The Rationalists, in turn, were interested in the psychological implications of form – a view that had been informed by Kandinsky's aesthetic and metaphysical premises. Ladovsky was adamant that the formal appearance of a building should not be determined exclusively by its function, but that it should be iconographic and emanate symbolical meaning. He later proclaimed space to be the most important factor in generating form (*ibid.*: 107), although, in this author's opinion, never proved convincingly. Ladovsky supported his convictions with quasi-scientific studies on the perception of form, space and colour, which, presumably, contributed to the choosing of the unfortunate term "rationalism" to denote their endeavours – a term derived more from the rationalization of their efforts than from substantiated scientific evidence.

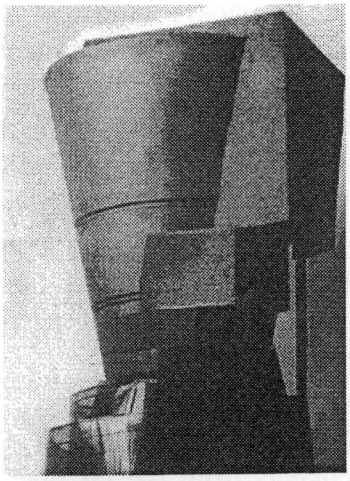
---

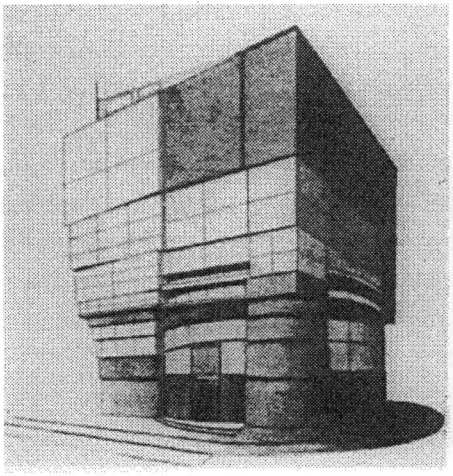
10 Kahn-Magomedov (1987: 67) simply refers to Sinskulptarkh as "the first association of avant-garde architects in the USSR" (as opposed to an educational institution). He also mentions an independent sculptural co-operative, assuming at the instigation of Sinskulptarkh, where Korolev offered his course in plastic composition. Evidently, it was as a result of these initiatives that the two renowned educational institutions, InKhuK and VKhuTeMas, were founded in Moscow in 1920.

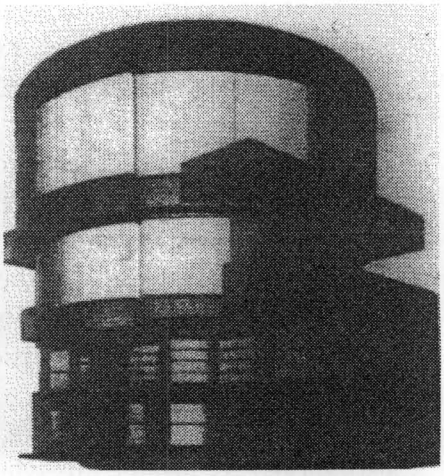


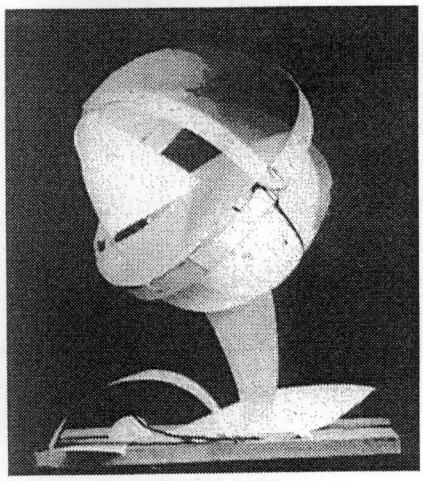


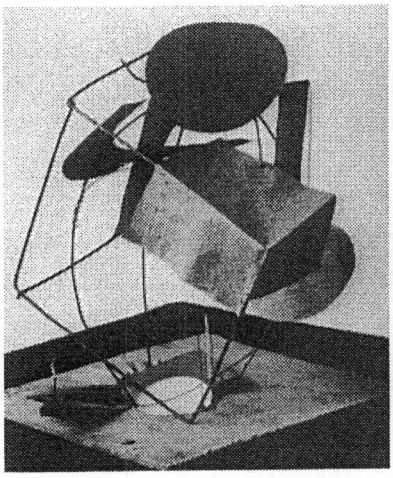


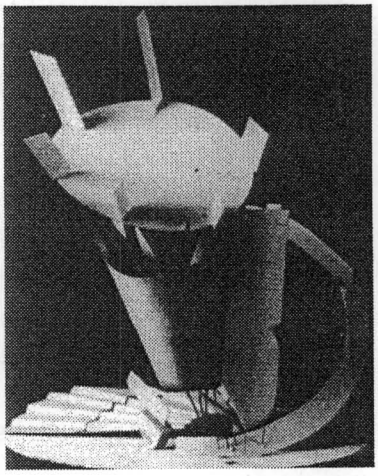


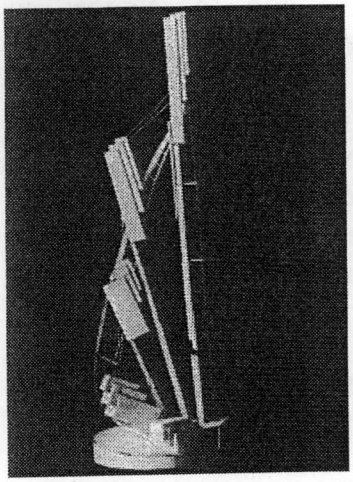


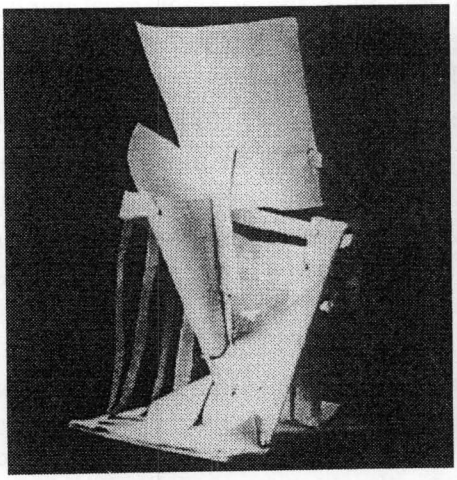


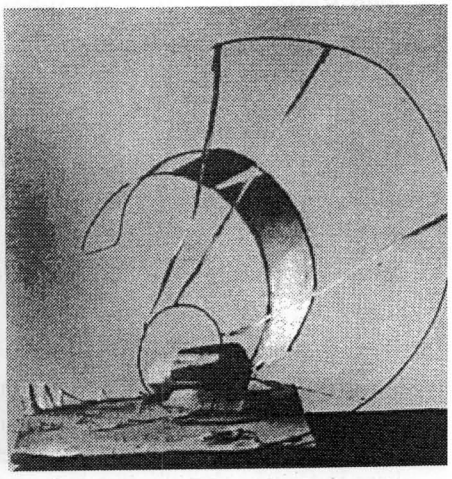












The dissemination of rationalist premises is complex and often contradictory, especially when taking into account that its evolution occurred over a twelve-year period. In hindsight, the aggrandizement of the 'scientific' aspect of Rationalism seems to have been a concerted effort at justifying its perceptual stance in opposition to the utilitarianism promoted by the Constructivists. According to Khan-Magomedov (1987: 107):

> "In Ladovsky's view, Constructivists paid too much attention to the technological and functional efficiency of architectural form, while he and the Rationalists argued additionally for the need to elicit objective perceptual, psychological and physiological criteria."

This statement summarizes the difference in approach between the Rationalists and the Constructivists, and underlies the turbulent aesthetic debate of the Modern Movement in the Soviet Union.

Ladovsky called consistently for methodical research into modern architectural principles in order arrive at so-called objective aesthetic criteria. At the same time, he encouraged creativity, innovative architectural form-making and original design solutions (*ibid.*). Despite the obvious contradictions, Ladovsky played a pioneering role in the pedagogical development of modern architecture in the Soviet Union. His psycho-analytical method of teaching was implemented at both VKhuTeMas (The Higher State Artistic and Technical Studios, renamed VKhuTein [The Higher State Artistic Technical Institute] in 1927) and InKhuK (Institute for Artistic Culture), the two renowned academic institutions found in Moscow in 1920. Ladovsky's famous course – known by the generic name of "Space Discipline" – also exercized a considerable influence on the Bauhaus cirriculum, although structured specifically for architectural purposes. The exercises dealing with the fundamental principles of architecture – form, surface, mass, volume, weight, balance, composition, and so forth – were soon adopted by academic institutions throughout the Soviet Union. These educational programmes contributed significantly to the sound disciplinary foundation that characterized the extraordinary creative output of the Soviet Union during the heroic period of the Modern Movement (*fig. 9.48*).

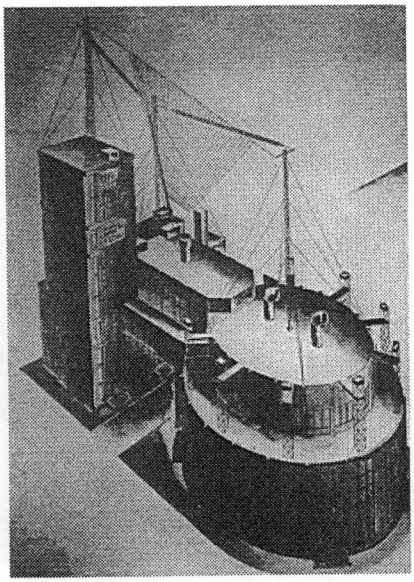
9.8 CONSTRUCTIVIST ARCHITECTURE (1923-1932)

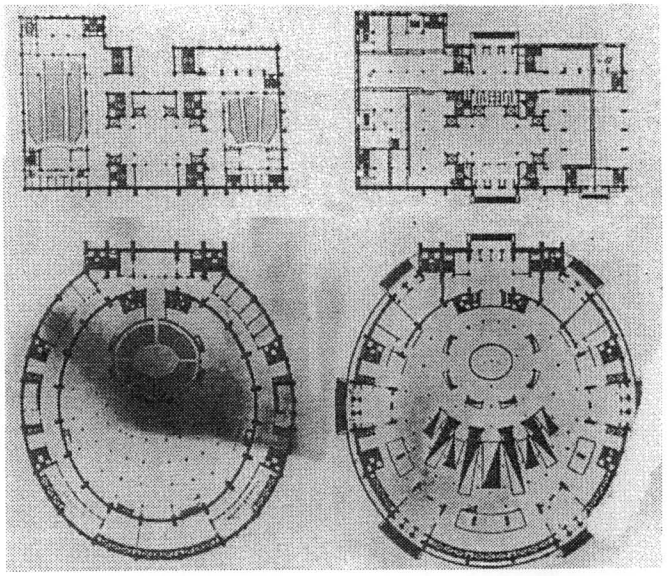
9.8.1 Introduction

It is important to bear in mind that the first substantial example of constructivist architecture materialized only in 1923 – some four years after the first architectural investigations had been initiated by Lissitzky, the Symbolic Romantics and the Rationalists. Historians cite the competition submission for the Moscow Palace of Labour by the Vesnin brothers (*fig. 9.49*) as the first fully resolved architectural project executed in a constructivist idiom, which, accordingly, excludes Tatlin's visionary Monument to the Third International.

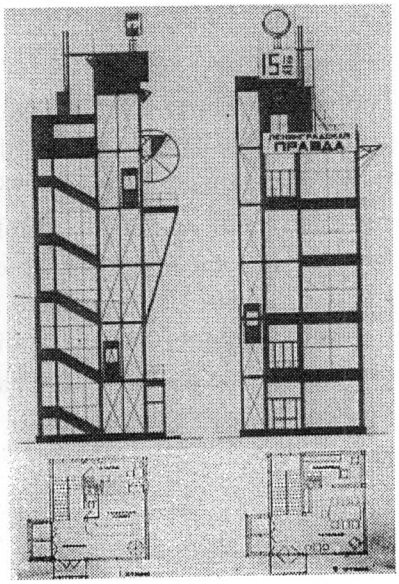
The Vesnins' competition entry was noted for its structural daring – a rectilinear volume suspended between the circular court-house and administrative components – functional clarity, industrial appearance and the extensive use of modern materials, including suspension cables (although they appear somewhat superfluous). However modern in comparison with other entries, this project did not come near to display the elegance, design maturity and technological integrity of the Vesnins' submission for the Leningradskya Pravda Building, Moscow (*fig. 9.50*), of a year later. Yet, the role of Alexandr Vesnin's set designs in informing his entrée into architecture cannot be over-emphasized.

The winning entry submitted by the Vesnin brothers for the ARCOS Joint-Stock Company Building, Moscow, also in 1924 (*fig. 9.51*), marked a watershed in the history of modern Soviet architecture: Constructivism, representing a viable, autonomous architectural movement, had finally come into its own. This project and the Leningradskya Pravda had elicited a tremendous response, both in the local press and abroad, and were frequently cited as [illegible]

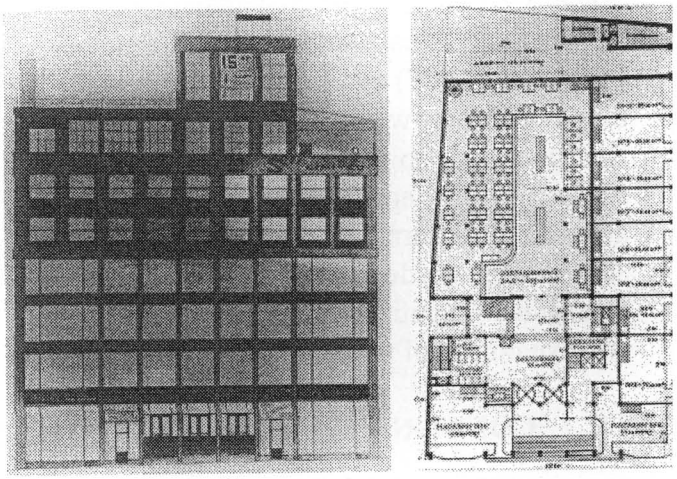




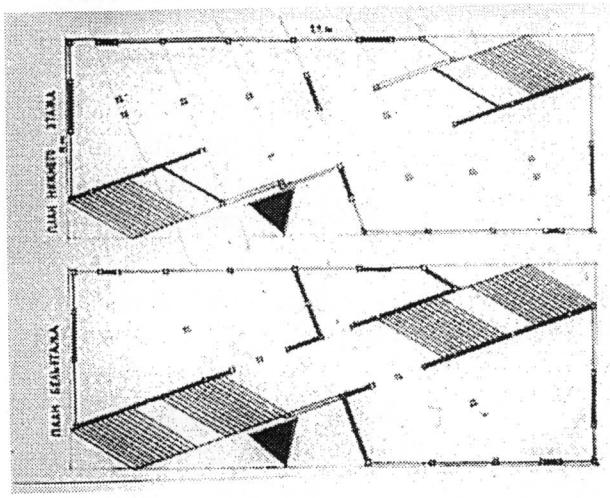
9.49 Vesnin brothers, Palace of Labour, competition submission (1923).

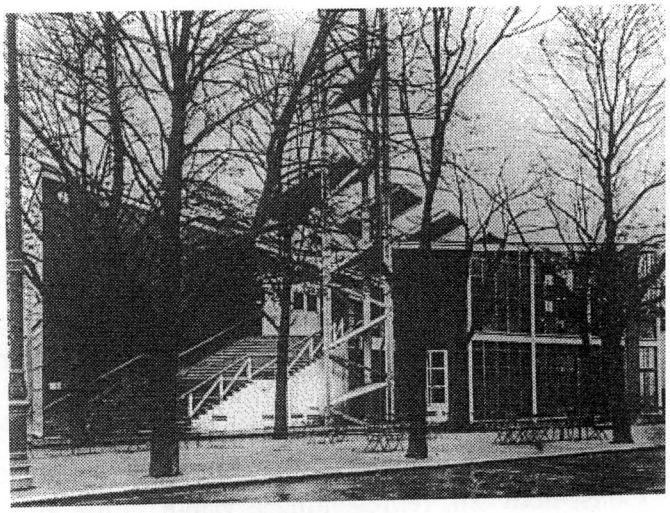


9.50 Vesnin brothers, Leningradskaya Pravda, competition submission (1924).



9.51 Vesnin brothers, ARCOS-Joint Stock Compan Building, competition submission (1924).





architecture. The sanctified industrial aesthetic was promptly adopted, amalgamated with the formal and compositional investigations conducted by the Suprematists, and furthered by the galaxy of talented Soviet architects – most notably, Lissitzky, Melnikov, Iakov Chernikhov (1889-1951) and Ivan Leonidov (1902-1959). As Khan-Magomedov (1987: 66) poignantly remarks:

> "Suprematist compositions, Prouns, Arkhitectons, Counter-Reliefs and spatial constructions ... formed part of the mechanism whereby the baton of innovation passed from painting to architecture."

Also noteworthy is the way in which the constructivist design idiom dominated subsequent competitions hosted in the Soviet Union during the next couple of years, evident also in Melnikov's winning submission for the USSR Pavilion of 1925 (*fig. 9.52*). Even the work of the Symbolic Romantic, Golosov, underwent a remarkable transformation because of these persuasive influences.

9.8.2 Theoretical Impetus

If the Vesnin brothers were responsible for the consecration of a constructivist architecture, its theoretical impetus and sobering functional bias were provided by the prolific architect and author, Moisei Ginzburg (1892-1964). Having obtained a conventional classical architectural education from the Academy of Milan, Ginzburg was as *au fait* with the inadequacies of Classicism in meeting contemporaneous demands, as with the exaltations of the Futurists. Upon his return to Moscow in 1914, Ginzburg furthered his studies in engineering at the Moscow Polytechnical Institute, travelled extensively and finally accepted a post as the chief editor for *Arkhitektura*, the journal of the Moscow Architectural Society (MAO), in 1922.

Familiar with the laboratory work of his contemporaries and acutely aware of the socio-political polemics of the day, Ginzburg developed a sound theoretical framework for a new architectural direction within a Soviet context. This was initially explored in his seminal writing *Stil' i Epokha* (Style and Epoch) of 1924, and expanded upon in a series of essays published over the next couple of years. Not only is *Stil' i Epokha* regarded as the Soviet equivalent of *Vers une Architecture*, but it was also closely modelled on the earlier publication, both in content and layout. Yet, as Catherine Cooke (1989a: 27), the Western authority on Constructivism points out:

> "While circumstances made Corbusier's fundamentally romantic book a major inspiration to architectural thinking world-wide, there is no doubt that Ginzburg's is the more useful and thoughtful work."

Like Choisy long before, Ginzburg equated the development of different stylistic characteristics with the evolution of construction techniques and structural typologies that responded to the technological, social, economical, and even national particularities of a specific place and epoch. The prevailing industrial era called for the development of a new 'plastic type' – not phenomenologically derived as in the case of Art Nouveau – but a type that would respond holistically to, or that had been predetermined by, all the above-mentioned factors. To this effect – as recognized also by Le Corbusier – the machine and modern engineering structures served as precedents for establishing new design parametres and aesthetic criteria. Ginzburg was adamant that it was not their formal appearance that should be imitated, but the underlying principles, as posed in *Stil' i Epokha* (1924):

> "How are we to build a bridge between these contemporary ensembles and the architectural monuments, once we realise that this is possible only through the principles of creativity and not through the actual forms? " (Cooke, 1989a: 28)

Dismembering The 1ST object is to establish the FORM of the SOCIAL CONDENSER as the product of:

1: The social and productive preconditions of the brief:

Consideration of all the PRECONDITIONS - both REQUIREMENTS and POSSIBILITIES

a. Study of how these may change through social and technological changes - stressing not the dimensions, but the dynamic, the changing use of the spaces over time.

b. Build up the FLOW DIAGRAMS - from individual ones to the overall one, which is THE FIRST SPATIAL DIAGRAM OF THE BUILDING.

c. Study the SCHEMES OF EQUIPMENT these require. d. Establish the DIMENSIONS of that equipment, also the correct FUNCTIONAL SPACING of it.

e. Study the ENVIRONMENTAL REQUIREMENTS of the activities and processes taking place - temperature, light, accoustics.

f. Build up the scheme of the SOCIAL CONDENSER on the basis of this material - establishing an integrated organism as a SPATIAL PROTOTYPE.

2: The technical and constructional preconditions of the realisation:

a. Study of the BUILDING MATERIALS at the architect's disposal - stressing the maximum possible revolutionary reassesment of them, using as far as possible the most advanced (ie the minimum mass).

b. Study of the STRUCTURAL METHODS AND SOLUTIONS that are appropriate in the light of the preconditions of the brief; study their character and the technical possibilities that they afford. - stressing the most RATIONAL methods of construction in the light of the spatial possibilities.

c. Study of the conditions and methods of PRACTICAL REALISATION involved, in relation to each detail and to the architectural whole. - the actual METHODS OF BUILDING, seeking the maximum INDUSTRIALISATION, 'assembly' rather than 'building' with all the architectural consequences of this.

Consideration of PERCEPTION and VISUAL CLARITY

The 2ND object is to look at the MATERIAL FORMS crystalised as the social condenser, in terms of the PROBLEM OF PERCEPTION, so that the useful activity of the condenser is enhanced by the user's clear perception of it.

Constructivism sees FORM as ACTIVE, rather than passive.
It sees the ORGANISATION of PERCEPTION as much as part of its task as the organisation of the material factors.

There are two stages to this:

A: The following must be studied IN ORDER, from PARTICULAR properties of the particular object, to GENERAL questions:

1. The FUNCTIONAL CHARACTER of the object, its purpose
2. Its STATE - static or moving?
3. MATERIAL - its properties and faktura, colour etc
4. The RELATIVE SCALES of parts and whole
5. The TEKTONIC STRUCTURE of the object.
   How it is constructed. The links of parts and whole.
   The principles upon which its parts are related.
6. FORM AS A BOUNDARY, a 3-D volume, a defined space
7. The main distinguishing marks of the object as a SPATIAL ORGANISATION

(a) Perception in respect of the fundamental characteristics of the object

(c) Perception of UNITY AND WHOLENESS.

(d) How to ORGANISE PERCEPTION to make CLEAR the relationships of the elements comprising the object, their absolute and relative SIZES, clarity of the OVERALL SPATIAL FORM of it.

(b) Perception in respect of SPATIAL INTER-RELATIONS and of SPACE in general.

B: In relation to the perception of these characteristics, the second stage of the studies ARE THEN GROUPED AS ABOVE, (a)-(d)

Consideration of the RATIONAL USE of the FORMAL ELEMENTS of the architecture

The 3RD object is to study THOSE ELEMENTS OF ARCHITECTURE ITSELF which are the OBJECTS OF PERCEPTION, namely, in order of COMPLEXITY

A: SURFACE B: VOLUME, as a system of surfaces

C: The volumetric coexistence OF MANY BODIES (intersecting, or contiguous, or related but separate)

D: SPACE TIME and MOVEMENTS as METHODS OF ORGANISING SPACE; space as the inter-relation of individual volumes TO EACHOTHER and the whole; the LOCATION of an object in space; space as an ISOLATING factor; space as the ORGANISATION of NON-RELATED or PARTIALLY RELATED dimensions (space - street - town etc).

TWO IMPORTANT PRINCIPLES are to be observed THROUGHOUT THIS PROCESS:

1: None of this laboratory dismemberment must concern itself with ARTISTIC EXPRESSIVENESS IN GENERAL, for Constructivism only understands expressiveness CONCRETELY, in relation to DEFINITE AIMS AND INTENTIONS, as something specific to its context.

2: All such studies carry the basic danger of CANONISATION of certain forms, of their becoming fixed elements of the architect's vocabulary. Constructivism is LEADING THE BATTLE against this phenomenon, and studies these basic elements of architecture as something CONTINUOUSLY CHANGING in connection with the changing preconditions of the form-making situation. It NEVER ADMITS therefore the FIXING OF FORMS. Form is an unknown, 'x', which is always evaluated anew by the architect.

Therefore we have ALSO TO STUDY not just the ELEMENTS OF ARCHITECTURE, but the METHODS OF THEIR TRANSFORMATION; we have to study HOW THAT FUNCTION, X, CHANGES, how a change in the brief effects the form.

Amongst such TYPES OF TRANSFORMATION we may include:

1. change in the object's external relationships;
2. vertical or horizontal dismemberment of it;
3. the cutting of the surface or volume from the inside (doors, windows etc);
4. the cutting of the surface or volume from the outside (change of silhouette);
5. differences in the object's material, colour or faktura;
6. change in the spatial relationships of its parts;
7. the introduction of mobility into the parts or the whole;
8. the introduction of new (working) elements, and so on.

In all this, 3 things are vital:

1: This method of transformations is PART OF THE ARCHITECT'S REAL, PRACTICAL TOOLS;

2: That TRANSFORMATION involves not just AESTHETICS, but reorganisation of the WORKING, CONSTRUCTIVE ELEMENTS;

3: That what we are changing is the MATERIAL OBJECT, but this is done IN THE CONTEXT OF ITS ESSENTIAL PURPOSE and of its PERCEPTION BY THE USER.

Consideration of the POSSIBILITIES of INDUSTRIALISED BUILDING.

The 4TH object is the study of INDUSTRIAL PROCESSES, not as FETISHISM, not to IMITATE industrial forms, but to identify THOSE CHARACTERISTICS that will be the HALLMARKS OF INDUSTRIALISATION in ARCHITECTURE. Thus we study:

1: How industrial technology CREATES a functional form.

2: The particular processes characteristic of industrial production which LEAVE A STAMP on the character of its products.

This must be done in relation to the INDIVIDUAL COMPONENTS of the building and in relation to WHOLE ORGANISMS (kitchens etc).

Reassembly The 5TH object is THE RESTORATION OF ORGANIC WHOLENESS. This applies whether the functional method was being used for ANALYSIS OF an EXISTING PRODUCT, or for the CREATION OF A NEW PROJECT. (Either of these processes involves all four sections above.)

9.53 Cooke's Summary of Ginzburg's Functional Design Method.

These principles of creativity referred to honesty (design integrity), structural simplicity and economy of means, and found endorsement in the fact that engineering phenomena contained nothing superfluous, accidental or decorative. According to Cooke (*ibid.*), Ginzburg also stated that "neither the engineering structure nor the machine gives us an expressive spatial solution which is what constitutes the distinguishing mark of architecture", but he never argued the point convincingly. Yet, his writings are replete with liberal references to "spatial types" and "spatial organization", which nowadays would translate as space-planning, rather than the conscious manipulation of plastic space.

Unlike the poetic rhetoric that characterized *Vers une Architecture*, Ginzburg was far more methodical and explicit in his structuring of the machine analogue, providing, especially in ensuing articles, an extensive strategy for design implementation – an aspect that was distinctly lacking in Le Corbusier's writings. This finds corroboration in Cooke's views (*ibid.*: 28):

> "For all Corbusier's eulogies on the logical and precise methods whereby engineers create forms, nowhere did he attempt to build a bridge into the practice of architecture."

9.8.3 Methodological Impetus

It is exactly this methodological component that consistently distinguishes modern Soviet architecture from other pioneering aesthetic initiatives. Although all the early modern architectural movements provided elaborate justifications for their design intentions, none developed as extensive a strategy of implementation as the Soviets. As has been referred to, even the Bauhaus curriculum was informed by their example.

Ginzburg's series of articles published in *Sovremennaya Arkhitektura* or *SA* (Contemporary Architecture – the mouthpiece of the Union of Contemporary Architects [OSA]) between 1926 and 1930, contained his systematic analysis of a so-called functional design method, characteristically listed under theoretical and operational categories, which Cooke (*ibid.*: 29) eloquently condensed to table format (*fig. 9. 53*). Ginzburg devised a linear model of supposedly scientific design decision-making in which intuitive form-making was subjected to utilitarian and social demands. Ginzburg and the like-minded Constructivists (predominantly those based in Moscow) went to great lengths to substantiate this functional design approach with available technical and statistical data, playing a pioneering role in advancing building science and quantifying their findings. Cooke (*ibid.*: 36) is of the opinion that the emphasis on emperical disciplinary knowledge was indicative of a professional obligation felt to the Marxist-materialist society – an observation made in response to her unsourced remark by Lenin:

> "In order to really know an object, it is necessary to comprehend, to study, all aspects of it: all its internal and external connectivities."

Considerable attention was also given to the development of design strategies and building typologies for collective facilities for which no precedent existed, and for which new design norms and building standards had to be established. In these instances, advantage was taken of the enticing possibilities presented by modern technology and new building materials, coupled with novel concepts, such as, pre-fabrication and standardization.

In an article, entitled "Constructivism as a Method of Laboratory and Teaching Work" (1927), [11] Ginzburg stated that although he approved of laboratory work as an essential component of architectural education, these formal and plastic investigations should not be aesthetically motivated (Cooke: 1989a: 31). Instead, such exercizes should merely equip the student with a design vocabulary necessary to meet different programmatic requirements. Ginzburg's convictions are paraphrased by Cooke (*ibid.*) as follows:

The elements of form

Elements on a plane

1 Linear elements

The line occupies the absolutely dominating position in all representation of form. It is therefore the starting point of all compositional work.
Lines may be classified in the following ways:

- according to the movement characteristics of the point generating the line, as:
  - straight
  - broken
  - curved
  - mixed
- according to direction, as:
  - vertical
  - horizontal
  - diagonal
- according to position, as:
  - lines on a plane
  - lines in space
- according to degree of regularity, as:
  - right
  - non-right
- according to relationship with other lines:
  - intersecting
  - non-intersecting
  - intertwining

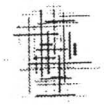
They may also create figures or part-figures of 2 kinds: closed & non-closed

All these possible combinations of lines are available for expressing our ideas in a series of constructions.
Different technical devices, such a changes of thickness of the lines, are available for reinforcing a composition's constructiveness.

Constructive compositions of STRAIGHT lines are the first stage.

We may thus set exercises of the following kinds:

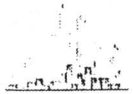
1 To assemble a harmonious combination of straight lines of different thicknesses in order to get a linear coloured ornament.



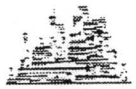
2 To compile a bunch of coloured straight lines with a dynamic slope.



3 From a series of vertical straight line lines to assemble an image which would produce the impression of a building.



4 The same, out of horizontal lines alone.



5 The same, out of vertical and horizontal lines.



BROKEN LINES are the next stage.
1 To compile from broken lines a bi-coloured ornament.
2 To compile from broken lines a bi-coloured figure drawing.[6]



The third stage will be constructive compositions of CURVED LINES.

These have particular interest as a result of the abundance of compositional possibilities and the infinite diversity of possible curves, paying attention always to the smoothness of an elastic curve, which is the source of its dynamic properties. Their wide usefulness derives from the way these dynamic properties enhance the constructiveness of our constructions.

Curved lines may be classified into the following types:
- nodal
- spiral
- circular
- mixed with smooth transitions
- complex curves

Each has its own characteristics and its specific artistic value. The spiral, for example, is especially popular for its essential tension.

Through smoothly conjugated lines and complex curves we can construct the most intricate compositions which communicate our thoughts with intense visual conviction.[7]
Exercises might be:

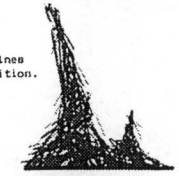
1 To assemble from curved lines a dynamic ornament.



2 To assemble from curved lines a static drawing.



3 To build from curved lines a coloured spatial composition.



We may do the same with MIXED LINES.[8]

2 Planar elements

A composition is planar when all its elements are distributed on one plane surface. Planar compositions offer study material for many series of exercises. The simplest employ the so-called 'right' figures, the rectangle, [illegible] and circle.[9]

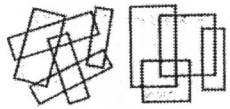
The non-right figures are infinitely numerous and potentially complex in construction. They may be classed by external configuration as follows:
- rectilinear figures containing right angles
- rectilinear figures with no right angles
- curvilinear figures
- figures of mixed outline

Rectilinear configurations have the greatest interest for us, since they have the widest range of practical applications, but those with acute and obtuse angles have less potential to make constructive combinations.
Curvilinear figures sometimes completely resist constructive combination. We cannot constructively link 2 circles, though curvilinear planes are sometimes capable of constructively embracing each other.

Figures of mixed outline can permit rich constructive combinations.[10]

Constructive combinations of PLANES ON A PLANE are the threshold of many practical tasks. The preliminary solution of a building plan requires constructions of this order. Planar figures, being diverse in their configurations, have equally diverse roles in design.[11]
Exercises may include:

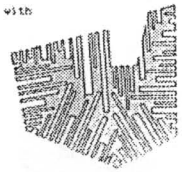
1 A coloured harmonic combination of horizontal and vertical planes.



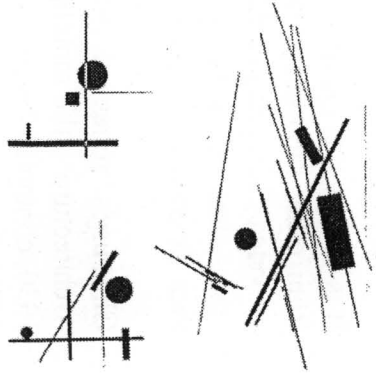
2 Composition of various transparent figures.



3 Treatment of the plane with an asymmetrical figure.



4 A complex coloured composition of a right-angled type with linear elements and a circle.

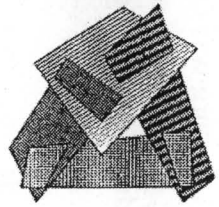


5 A bi-coloured composition from a series of elements.

STRAIGHT LINE figures.
BROKEN LINES.
CURVED LINES.
MIXED figures.

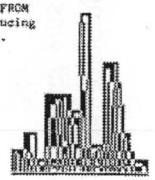


6 COMPLEX NON-RIGHT POLYGONAL figures with different colourations.

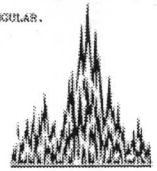


7 SYMMETRICAL COMPOSITION FROM A SERIES OF RECTANGLES producing an impression of a building.

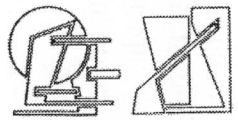
THE SAME, but ASYMMETRICAL.



8 THE SAME, but NON-RECTANGULAR.



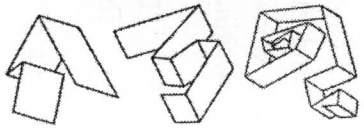
9 COMBINATIONS OF NON-RIGHT figures[12]



Elements in space

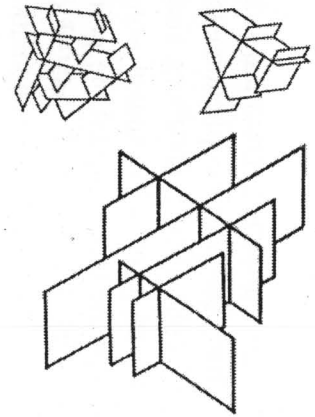
1 Planes

A BENT SINGLE PLANES are the first step towards a formal solution of the simplest spatial concepts. Artistic expressiveness depends on the designer's particular solution.



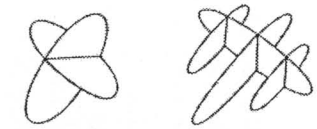
B SPATIAL COMBINATIONS OF SEVERAL PLANES are among the most valuable exercises for developing spatial thinking and familiarity with constructive principles. The basic principles of constructivism are encountered here. The intersection of one plane with another produces a constructive joint. Proportional relationships and relative angles determine the quality of overall constructive spatial combinations. The configuration of the component planes may be as follows:

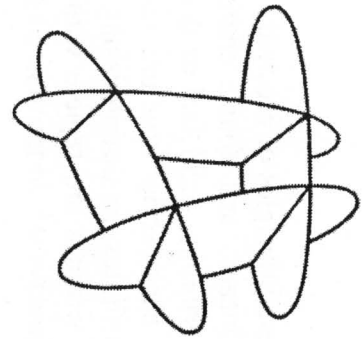
1 Rightangled rectilinear planes are the most useful for building constructive combinations through the diversity of manipulation possible with these universal forms in the area of buildings and machines. The matching of one rectangular plane to another requires little force, and the compositions may have powerful dynamics of a horizontal, vertical, an inclined or mixed type.



2 Polygonal rectilinear planes rarely offer useful constructive combinations.

3 Ovals and circles are more attractive, but their specific external configurations limit the constructive possibilities available.





4 Indeterminate forms can be assembled constructively, but they have no interest for us, being very rarely encountered in practice.[13]

> "[According to] these grammars and disciplines of formal construction were the essential prerequisite if the architect was to respond with perfect fluency to new social briefs, to handle the logical evolution of his own design solutions, and to refine those solutions to the point of perfect formal and stylistic coherence."

In stark contrast with the 'precise', even mathematical, [12] precepts propagated by Ginzburg and his followers, the unique methodological contribution of the prodigiously talented, Leningrad-based architect Chernikhov warrants special attention. Chernikhov's entire approach to architecture was premised on laboratory work, which he pursued with a rigour and dedication unlike anyone else in the constructivist genre – if not in the entire history of modern architecture (*fig. 9.54*).

Chernikhov, too, adopted mechanical engineering as the design paradigm for modern architecture, but which he admirably synthesized with the formal and compositional aspects of Suprematism. In the process, he devised a so-called method of compositional invention which he documented and illustrated extensively. [13] In *The Construction of Architectural and Machine Forms*, Chernikhov's *magnum opus*, he pursued the machine analogue far more literally than theoretically, and even referred to the different modes of mechanical jointing (*fig. 9.55*) as the basic principles of Constructivism:

> "The fundamental elements of constructivism consist of all the various possible unions of elements which go to make up a structure. The following formal relationships of elements must therefore be recognised as the basic principles of constructivism: a) Insertion b) Clamping c) Twisting d) Embracing e) Mounting f) Bending g) Coupling h) Piercing, and so on." (ibid.: 32)

Most significantly, Chernikhov – often referred to as the Russian Piranesi – was able to translate these basic engineering strategies into magnificent architectural structures or *fantazii*, which only recently captured the attention of architects world-wide (*fig. 9.56*).

Chernikhov's exceptional understanding of the rudimentary principles of architecture (internalized as a result of the advances made in modern art and modern sculpture), combined with mechanical engineering, provides the most comprehensive – although completely underrated – example of the codification a modern architectural vocabulary. The exhaustive extent to which he itemized the various aspects of architecture and demonstrated their tectonic realization in his seminal publications, *Fundamentals of Contemporary Architecture* (1930), *The Construction of Architectural and Machine Forms* (1931) and *Architectural Fantasies* (1933), serves as testimony of an extraordinary creative output and genius. Unlike his Muscovite counterparts, Chernikhov never negated intrinsic aesthetic principles, and even admitted to the complexity of the design-making process. The following translated extract from *Fundamentals of Contemporary Architecture* (1930) serves as a case in points:

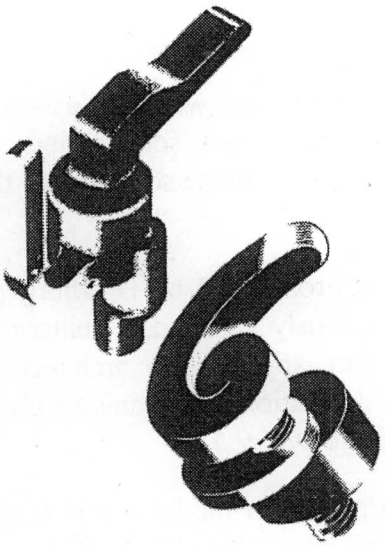
> "Every person is endowed with the feeling for the CONSTRUCTIVE. But that feeling expresses itself in the most diverse ways and in different intensities. There are sudden moments of constructive inspiration, when new solutions and new ideas flow extremely rapidly in our creations ... In contrast, there are depressive moments, when we lack any feeling for construction ... It is necessary therefore to recognise the unarguable fact that the act of CONSTRUCTION must be regarded as a complex and powerful experience." (Cooke, 1989a: 54)

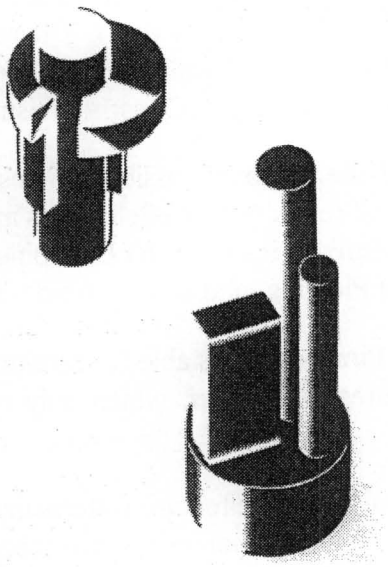
---

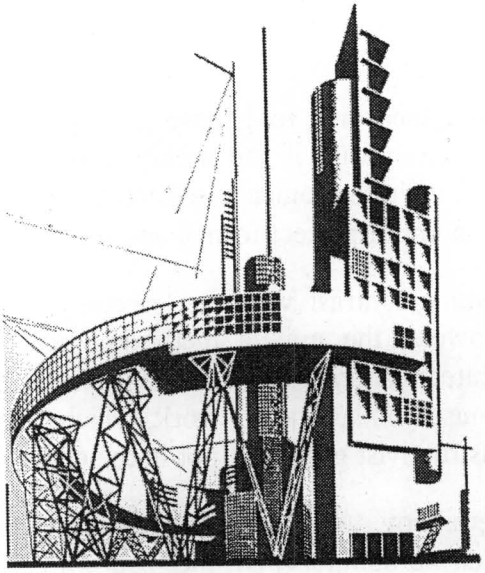
11 See the condensed contents of Ginzburg, 1927, "Constructivism as a Method of Laboratory and Teaching Work", *SA*, no. 6 (Moscow) in Cooke, C., 1989, 'The Development of the Constructivist Architects' Design Method", Papadakis, A. (ed.) *Deconstruction Omnibus Volume* (London: Academy Editions), 29.

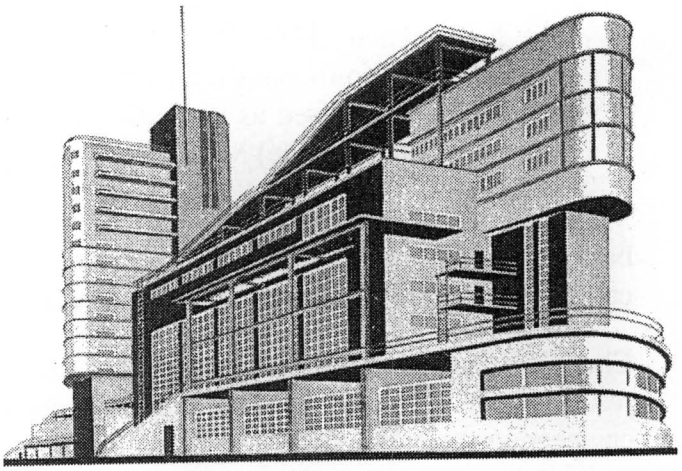
12 See the mathematical design methods advanced by former VKhuTeMas students, Nikolia Krasilnikov (1899-1983) and Lydia Kamarova (q.v.), as outlined in Cooke (*ibid.*: 33-36).

13 See Papadakis, A., 1989 (ed.), *AD – Russian Constructivism and Iakov Chernikhov*, vol. 59, no. 7/8, dedicated to Chernikhov's *oeuvre* and design methodologies. In this issue, refer specifically to translated extracts from Chernikhov, 1931, *The Construction of Architectural and Machine Forms.*

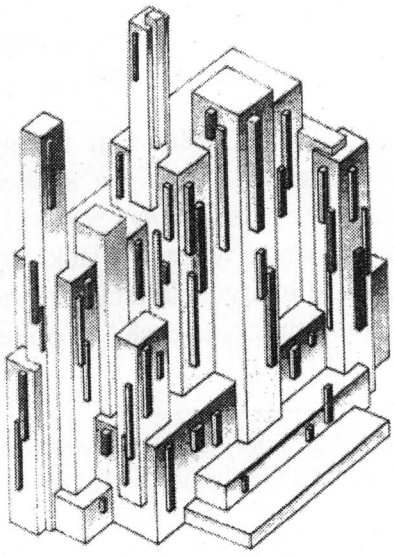




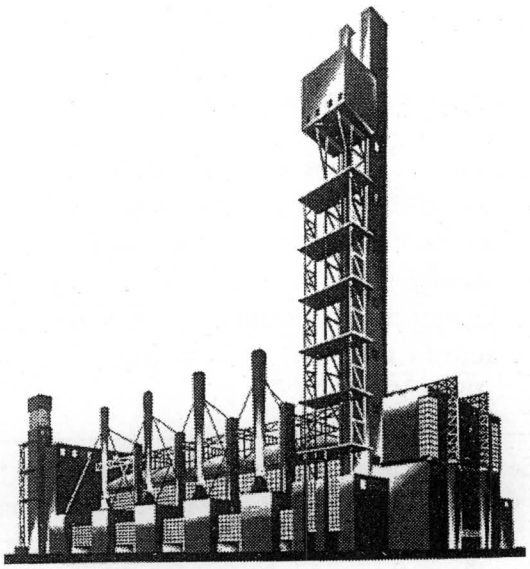




9.55 Construction principles derived from mechanical engineering.



Formal composition



Projects incorporating constructive and suprematist principles

and Machine Forms (1931)

Perhaps owing to a lack of planimetric information (just as in the case of Sant'Elia's futurist fantasies), Chernikhov's magnificent three-dimensional drawings do not exhibit the spatial deliberation and intensity evident in the work of Le Corbusier, Rietveld and Mies. Rather, the formal treatment, subject matter and rendering techniques of Chernikhov's visionary projects recall the monumental edifices and mechanistic imagery of Sant'Elia – a correlation worthy of academic pursuit. Notwithstanding, Chernikhov developed an architectural inventory that demonstrated a formal complexity, compositional modulation and creative exuberance unsurpassed by few.

9.9 THE DEMISE OF CONSTRUCTIVISM

It is noteworthy, that as Constructivism gained in popularity, it was increasingly employed stylistically, compelling its major theoretical proponents to continually emphasize its scientific (versus embryonic artistic) *modus operandi*. Khan-Magomedov (1987: 193) asserts that the founding in 1925 of the architectural union of the Constructivists, OSA, by Ginzburg, the Vesnin brothers and Gan, amongst others, was a concerted effort to combat this tendency towards stylization. This is particularly evident when reviewing the objectives of OSA, written in 1926:

> "OSA brings together people closely bound by a single ideology and conducts collective-theoretical scientific research and practical work on a well-defined plane in a struggle against inertia and survivals from the past." (Khan-Magomedov, 1987: 595) [14]

Mention is also made of the difference in design approach between themselves and ASNOVA (Association of New Architects, founded in 1923), the professional association of the Rationalists:

> "ASNOVA is the union of a small group of architects with a definite ideology, the essence of which is the quest for an abstract form in purely aesthetic terms. OSA [by contrast] collectively resolves, and implements in practice, the new architectural form functionally derived from the purpose of a given structure, its materials, construction and other production conditions, and thereby responds to the concrete tasks set by the socialist development of the country. " (*ibid*).

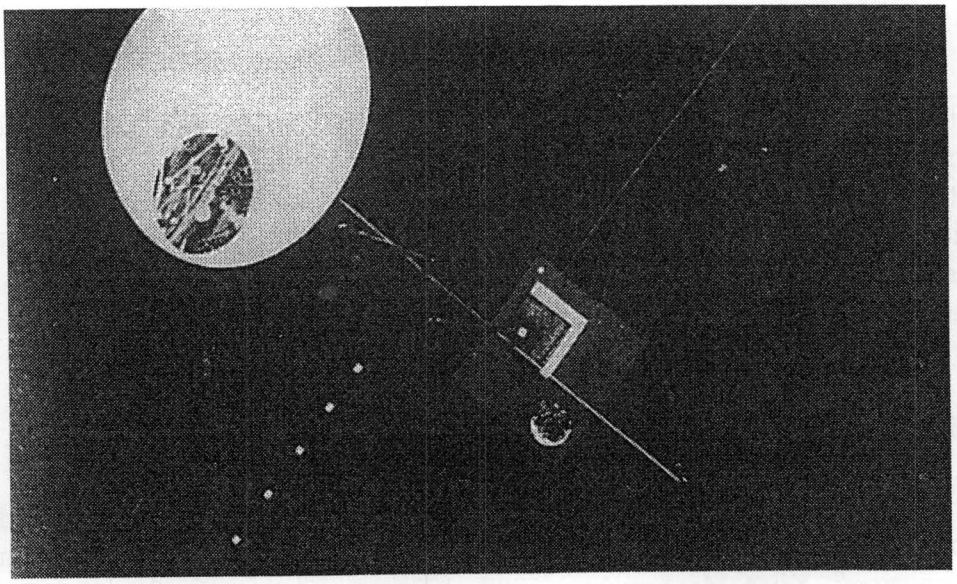
Also telling is how chose to qualify one of the principal objectives of the functional design method of Constructivism in his essay entitled "Constructivism as a Method of Laboratory and Teaching Work" (1927):

> "The 4th object is the study of INDUSTRIAL PROCESSES, not as FETISHISM, not to IMITATE industrial forms, but to identify THOSE CHARACTERISTICS that will be the HALLMARKS OF INDUSTRIALISATION in ARCHITECTURE." [Emphasis as quoted] (Cooke, 1989a: 29)

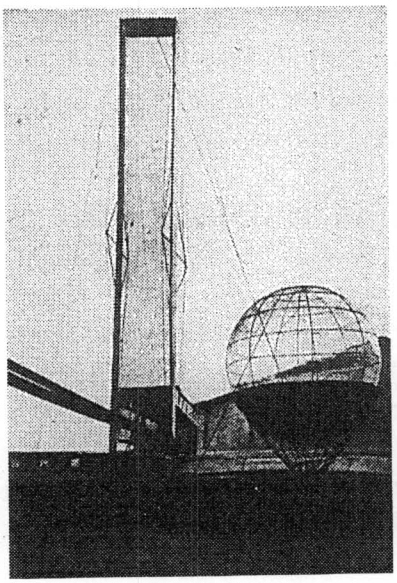
It is equally significant that Ginzburg had chosen Tatlin's Monument to the Third International as exemplary of the new architectural approach emerging in the Soviet Union in *Stil' i Epokha*, but retracted this choice some four years later and dismissing it as "naive symbolism" (Cooke, 1989a: 30). The vindictive review of Chernikhov's architectural treatise *Fundamentals of Contemporary Architecture* by constructivist critic Roman Khiger (1901-1970s) in the journal *Sovremennaya Arkhitektura* (1930), was just as disdainful:

---

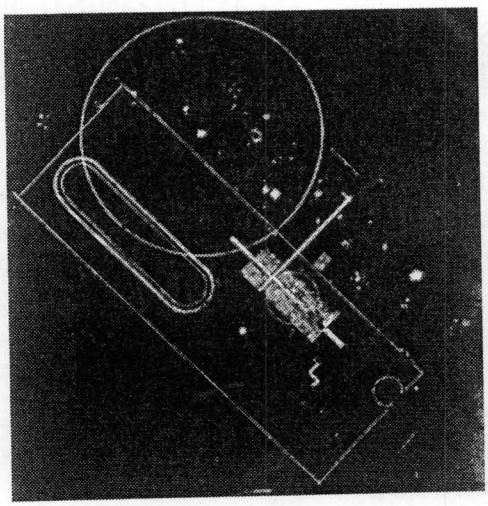
14 Extract from OSA's statement addressed to the Art Department, Chief Administration for Science and People's Commissariat for Education, as quoted from Kahn-Magomedov (1987: 595).

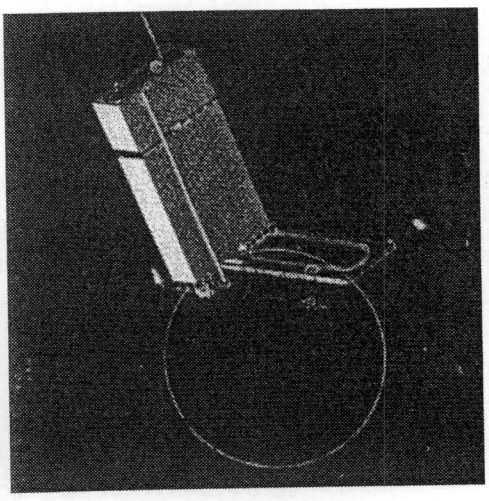


9.57 Leonidov, Lenin Institute, project (1927).



9.58 Leonidov, Monument to Columbus, project (1929).





9.59 Leonidov, House of Industry, project (1929).

> "Our architecture has long ago outlived the 'symbolic' formalism of Ia. G Chernikhov. If the book had appeared in 1921-1922, when symbolism was flowering here, and 'the dynamic' was rampant in all its forms and diversity, it might perhaps have played a certain role. Now, though, the discussions recited in this book are in the majority of cases anachronisms, and even at times amusing." (Cooke, 1989d: 16)

The criticism levelled at Chernikhov soon befell Leonidov (*figs 9.57-9.59*), whom Le Corbusier, during his visit to the Soviet Union in 1928, had described as "a poet, and the hope of Russian Architectural Constructivism" (Weston, 1996: 158). Ironically, whereas the criticism of Chernikhov's *magnum opus* was expressed by one of his fellow Constructivists, Leonidov was attacked by both the public at large and the political oligarchy. The derogatory reference "Leonidovism" – equated with adjectives, such as, "irrelevant", "experimentation", "profoundly individualistic", "petit-bourgeois" and "unrealistic" (*ibid.*: 159) – was indicative of the ever-increasing and indiscriminate opposition to modern art and modern architecture in general.

Even though the communist politicians never took kindly to any of these bohemian creative initiatives and most certainly did not share the aesthetic sensibilities of their creators, [15] the utilitarian and social content of Constructivism did give it an initial, though shortlived, degree of credibility. If Lenin had, at most, tolerated "the bourgeois philosophical ideas" that were disguised "under the cloak of proletarian culture" (*ibid.*), [16] the political scenario had changed dramatically since Stalin's rise to power in 1927. In hindsight, the volatility of the political climate must have contributed to the Constructivists' increasing emphasis on the utilitarian and social aims of their architectural programmes, and their ultimate negation of all aesthetic considerations. Furthermore, the dissent amongst the Rationalists and Constructivists only weakened their collective position to thwart the onslaught on modern architecture, which were fought on several fronts simultaneously. Sardonically, during the late 1920s and early 1930s, many of the pioneering Constructivists, such as, Rodchenko, Popova and Stepanova, came under attack – even by some of their former students who considered them ideologically suspect and regarded their work as "bourgeois subjectivism". [17]

Despite all their utilitarian exaltations, the work of the Constructivists was, according to Irena Kokkinaki (1983: 58), ultimately proclaimed "a reflection in architecture of the psychology and ideology of large-scale capitalist elements within the bourgeoisie". [18] The international competition hosted for the Palace of the Soviets in 1932 that was won by the multi-tiered, neo-classical concoction

---

15 During his exile in Zurich, Lenin lived close to the Dadaists, whose bizarre antics failed to impress him. Instead, they instilled in him a grave suspicion of all forms of radical artistic expression. He moreover failed to understand these avant-garde artist's rejection of traditional pictorial conventions. On the authority of Weston (1996: 149), Lenin questioned "this nonsense that seeks to destroy and reject what is beautiful purely on grounds that it is old". Weston, *ibid.*, also maintains that Lenin did not like Tatlin's Monument to the Third International.

16 Lenin, quoted unsourced in Weston (*ibid.*: 149), though aimed at the founder members of Proletkult (The Proletarian Organization for Culture and Education) in the late 1910s.

17 According to Weston (*ibid.*: 159), these criticisms were levelled at Rodchenko's particular style of photomontage, whereafter the artist adopted a more conventional approach to photography. The range of textiles by Popova and Stepanova, sporting suprematist-inspired designs, was also severely criticized because it did not convey any political message. Their opponents insisted on so-called agitational designs that were to display industrial motifs. Ironically, these designs of machinery, aeroplanes, electrification, and so forth, did not prove popular with the proletariat who (not surprisingly) wanted floral patterns instead. Agitational designs were banned in 1933.

18 This statement, quoted from Kokkinaki, I., 1983, "The First Exhibition of Modern Architecture in Moscow", *AD*, vol. 53, no. 5/6: 58, were uttered in 1929 by exponents of VOPRA (All-Union Organization of Proletarian Architects, founded in 1928).

of Boris Iofan (1891-1976) – with Le Corbusier, Gropius, and Erich Mendelsohn (1887-1953) amongst the invited participants – allotted the death knell for further modern experimentation. Official communist policy on artistic and architectural expression, published in April and July of 1932, respectively, demanded that art be socialist in its content and realistic in its execution; and public buildings be monumental and classical in character, displaying murals and sculptures on revolutionary themes. [19] Any deviation from these promulgations was considered a crime against the state.

It is highly ironic that those militant advocates of a utilitarian art during the early 1920s and whose aggressive sentiments contributed to disillusionment and emigration of some of the Soviet Union's most talented individuals – Kandinsky, Gabo, Pevsner, Chagall and fashion designer Alexandra Exter (1884-1929) – were, less than a decade later, subjected to one of the most stringent forms of censorship ever. As early as 1929, Tatlin started to refer to the previously lauded engineering forms as "hard and evil" (Lodder 1983: 25), and directed his energies to the designing of his flying apparatus, the Tetatlin, made of timber and cork, and biomorhic in character. [20] He also reverted to figurative easel painting, as did Malevich who revived the artistic formulae of Impressionism and Post-Impressionism. Rodchenko, in turn, directed his attention to photography. Chernikhov, whose books were removed from all public libraries in 1935, managed to sustain his creative energies by indulging in a series of magnificently excecuted neo-classical and idiosyncratic architectural fantasies, displaying titles, such as, *Palaces of Communism* (1924-1941) and *Pantheons of the Great Patriotic War* (1942-1945). In his autobiographical notes (1940s; 1989: 85-86), Chernikhov justified his endeavours as follows:

> "I have concentrated my attention upon architectural fantasies because I consider these offer the only path for solving such a complex and responsible task as the creation in our country of buildings which have a genuine ideological foundation. Profound creative working and reworking of spatial and volumetric solutions into objects with a clear and consistent foundation in ideological concepts can help us create a soviet architecture that is truly socialist."

It is not clear how individuals, such as, Lissizky, Ginzburg and the Vesnins responded to the creatively stifling environment [21]. Evidently, Mayakovsky was the least prepared to compromise his aesthetic convictions since he committed suicide in 1930, whereas Klutsis fell prey to Stalin's infamous *gulags*.

When the moratorium on modern architecture was finally lifted after Stalin's death in 1954, it had lost both its lustre and theoretical impetus. The twenty-five million Soviet citizens left homeless after the Second World War, contributed significantly to a tipping of the scales in favour of the economic viability of modern architecture. The unprecedented housing programmes initiated between the 1950s and the 1970s, brought 's visions for a functional, univalent modern architecture to fruition, and with disastrous consequences. As Oleg Shvidkovsky (1987: 8), in a profile on contemporary Soviet architecture, remarks:

---

19 See Brown, M., 1991, *Art Under Stalin* (Oxford: Phaidon) for a comprehensive review on the policies and implications of these aesthetic decrees.

20 For the most extensive account on Tatlin's remarkable productivity, including reference to the Tetatlin, see Zhadova, L. (ed.), 1984; 1988, *Tatlin*, trans. Filotas, P., Julian, M., Lockwood, E., *et al* (London: Thames & Hudson).

21 According a biographical profile in Warnecke, P-C., 1991, *De Stijl 1917-1931* (Cologne: Benedikt Tashen), 210, Lissitzky was appointed chief architect of the Central Park of Culture and Recreation in Moscow and designed numerous buildings and exhibitions. No information is provided regarding their appearance. Neither has any information on or the Vesnins been encountered to date.

> "In the 1960s all this [very distinctive local tradition] was thrown out as having no significance in an age of industrialised housing construction. Out went the variety of colour and form which had provided so simply and effectively national architectural traditions in our towns and villages. In came standardised plans, housing blocks identical to each other like peas in glass preserving jars. Perhaps this was itself a sign of the times ... But why should the architecture in the socialist countries enjoy some special right to spiritual sterility?"

9.10 CONSTRUCTIVISM, IN CONCLUSION

This chapter indicated that Constructivism, like all the other architectural initiatives that emerged in the Soviet Union during the heroic period of the Modern Movement, was derived conclusively from artistic experimentation. Unlike Rationalism and Symbolic Romanticism, Constructivism did not evolve consciously as an architectural movement to combat past stylistic models. Instead, it was a logical extension of artistic pursuit, though yielded by socialist premises that were entrenched in the industrial phenomenon. The political circumstances and Marxist doctrine – founded on the socio-economic ramifications of industrial production – inoculated artistic endeavours, previously regarded 'useless', with utilitarian significance.

Cooke (1989c: xiii) rightfully notes:

> "In this belated Russia of the First Machine Age ... mechanical engineering [was] to effect the revolutionary changes promised by the Bolshevik victory".

Consequently, the machine was adopted as the primary intellectual, aesthetic, symbolic and operational paradigm of Constructivism. However, reverence for the machine was subjected to different interpretation. To Ginzburg and his followers, as conveyed in *Stil' i Epokha* (1924), it was its functionalist *modus operandi* that was important, serving as "the clearest expression of that ideal of harmonious creativity so long ago formulated by Alberti" (Cooke, *ibid.*: xiii). The machine was also responsible for honing their perception of modern beauty. In the words of Ginzburg, as quoted from Cooke (*ibid.*: xiii):

> "... under the influence of the machine is being hammered into our thinking a conception of the beautiful as that organisation of material which very best satisfies the particularities of the case, which most economically satisfies the given purposes, and which is most condensed in form and concise in movement".

By contrast, for Chernikhov, as for the early Constructivists, the machine provided a design analogue that could be translated, in very literal terms, into an industrial aesthetic. These conflicting interpretations underlie the difference in approach amongst the Constructivists themselves, and requires distinction. It also contributes to the complexity of Constructivism, which is often subjected to selectiveness and oversimplification – depending on the point of departure. In an article, entitled "Images or Intelligence", Cooke (1989b: v-ix) expresses her concern about Deconstructivism, since its proponents disregard completely the functionalist dispositions so extensively formulated by Ginzburg. By the same token, it was those very functionalist premises that both undermined and compromised the unique and dynamic plastic innovations of Constructivism.

Without attempting to denigrate the important, but overstated, role of Functionalism in architecture, one has to side with Chernikhov who – like Le Corbusier – acknowledged that any built structure, by definition, must be functionally sound, but realized that this was not the only design criterion. Consider the following views as expressed by Chernikhov in *Fundamentals of Contemporary Architecture* (1930; 1989: 46):

> "Even a successfully analysed brief cannot have any formal expression if the executant has not sufficiently mastered the disciplines of spatial and formal invention ..."

In *The Construction of Architectural and Machine Forms* (1931; 1989: 58), Chernikhov continues:

> "Formal and technical functionalism, as a method of work and analysis in architecture, does not exclude the possibility for harmonious interaction of principles of form and content ... from the formal and compositional fields as well as the technological and engineering ones, linking these together in a process of creative synthesis ..." [Emphasis added by author.]

Given the controversial history of modern architecture, it is not surprising that the prevailing fascination with Constructivism is derived from its novel aesthetic precepts rather than from its somewhat clichéd functionalist premises. It is exactly the processes of creative synthesis that Chernikhov refers to and that were so magnificently concretized by himself, Lissitzky, Melnikov, Leonidov, and others, that continue to intrigue and are currently being extended.

In the final analysis, as Weston (1996: 154) suggests, our indebtedness to the Constructivists stems from the contribution they made to the semantics of Heroic Modernism in having replaced "the past culture of solid objects and monumental buildings ... by transformable structures in space; static masses of stone ... by dynamic, gravity defying frames of steel and moving parts and volumes ... This dynamic new functionalism was a major addition to the Modernist vocabulary, and radically different from the Platonic beauties of the International Style." However different, it is noteworthy that due to the cross-fertilization of modern design premises, Le Corbusier's five points for a new architecture were widely adopted by the pioneering Soviet architects. Towards the late 1920s, the Dom-ino concrete frame, ribbon-windows, free plan, piloti and roof gardens featured extensively, but constructivist architecture displayed, in addition, a formal modulation and structural dynamicism that were unique to the Soviets.

It is not without irony that one takes note of the comments made by Anatolii Poliansky (1987: 6), a former President of the Union of Architects of the USSR:

> "Talking of new trends in [Soviet] architecture, I would like to end by underlying the most fundamental and important one. Architects are now remembering that architecture is an art; an art with vast educative and nurturing potential, whose duty it is to reflect spiritual values of its age and to produce some degree of harmony between need and environment both for society as a whole, and for each individual within it."

9.11 SUMMARY

This chapter provided a chronological review of the design premises of modern Soviet architecture, emphasizing the extent to which these have been entrenched in artistic experimentation.

Attention was foremost given to the volumetric implications of the pictorial innovations of Cubism as internalized by modern sculptors, particularly by Italian Futurist Umberto Boccioni. His introduction of an extended scale of materials that encompassed enormous tectonic, plastic and kinetic potential, precipitated the methodological connection between sculpture and architecture made, first, by Vladimir Tatlin, Russian fine artist and author of the Monument to the Third International.

Tatlin's advance from mobile counter reliefs to utilitarian structures served as precedent for both the pedagogical and methodological development of modern Soviet architecture, and concretized the much-publicized call for the politicization of the arts. His example elicited a tremendous response and resulted in the consecration of the constructivist initiative in 1921, which made highly original contributions to all the aesthetic disciplines in the Soviet Union.

The genesis of Constructivism also coincided with the volumetric stage of Suprematism, initiated by El Lissitzky with his influential architectural prototypes, entitled Prouns, and followed by Malevich's Arkhitectons and Planits. Lissitzky's and Malevich's unique formal, spatial and compositional investigations were amalgamated with the sanctified industrial aesthetic of Constructivism and furthered by the galaxy of talented pioneering Soviet architects.

The other two opposing architectural initiatives, Romantic Symbolism and Rationalism, were also derived from cubist experimentation as introduced by sculptor Boris Korolev, but employed rather superficially. The aesthetic precepts of the Romantic Symbolists were in due course assimilated by the Rationalists who ardently opposed the exclusivity of the functionalist tenets of Constructivism, Instead, they concerned themselves with the perceptual and metaphysical properties of architecture, informed by Vasily Kandinsky's spiritual propositions.

From the mid-1920s, the theoretical protagonists of Constructivism, led by Moisei Ginzburg, increasingly emphasized the scientific (versus the embrionic artistic) *modus operandi*, and subjected all design decision-making to utilitarian considerations and statistical data. The Constructivists earnestly believed that their functional, collective and standardized approach to architecture epitomized the socio-political ideals of the socialist state. The communist politicians, however, shared neither their convictions, nor their aesthetic sensibilities, and banned all modes of modern expression from 1932 until Stalin's death in 1954.

Modern Soviet architecture was a complex synthesis of diverse and often conflicting aesthetic and ideological premises, compounded by the highly individualistic and exploratory contributions by different architects. Notwithstanding, its most intriguing aspect is how modern artistic experimentation, derived from Cubism and Futurism, informed its dynamic mode of architectural expression – an aspect unique in the history of modern architecture.

CHAPTER 10 THE TECTONIC INCARNATION OF ABSTRACT ART: DE STIJL

10.1 PREFACE

This chapter concludes the assessment of the volumetric transformation of modern art as demonstrated by the Dutch movement, De Stijl.

The introductory part of this chapter traces the genesis of the architectural component of De Stijl, familiarizing the reader with its diverse nature. This is followed by a thematic review of the tectonic transformation of neo-plastic painting, making a distinction between the elemental versus the elementarist artistic approach. Lastly, attention is again drawn to the undermining influence of the functionalist design rationale on the aesthetic precepts derived from the visual arts.

10.2 INTRODUCTION

Of all the heroic aesthetic initiatives, architectural historians consistently single out De Stijl as the one example in which architecture was informed conclusively by modern art. However, close examination reveals that the evolution of the architectural component of De Stijl was not as sequential – an aspect pertinent to Constructivism – or as cohesive as one is tempted to assume. In stark contrast with its pictorial development, neo-plastic architecture did not materialize as a series of consecutive steps. Instead, it emerged as a conflation of different premises, a coinciding set of circumstances, and was subjected to different interpretations.

Despite the fact that its theoretical premises were widely publicized since 1917, the distinct De Stijl aesthetic matured only three years later – architecturally, as well as pictorially. Warnecke (1991: 76) states that the incubatory period of neo-plastic painting was fraught with incongruities:

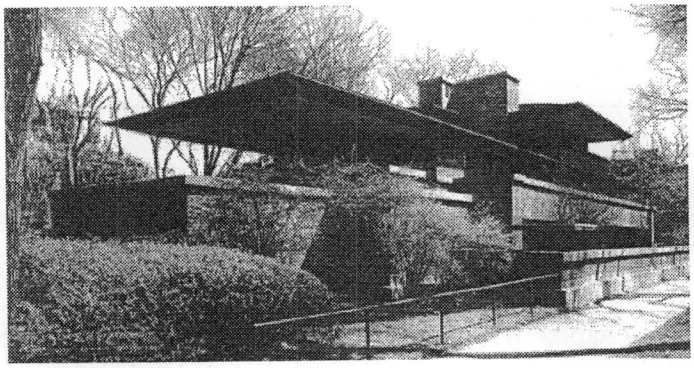
> "Mondrian's paintings of 1918 and 1919 seemed to be direct contradictions of his theoretical postulates ... the De Stijl artists were also faced with the fundamental difficulty of creatively putting an absolute postulate into practice."

Frampton (1980: 143-144) adds that "There was, in effect, very little Neo-Plastic architecture before 1920, when it made its first appearance in the work of Rietveld."

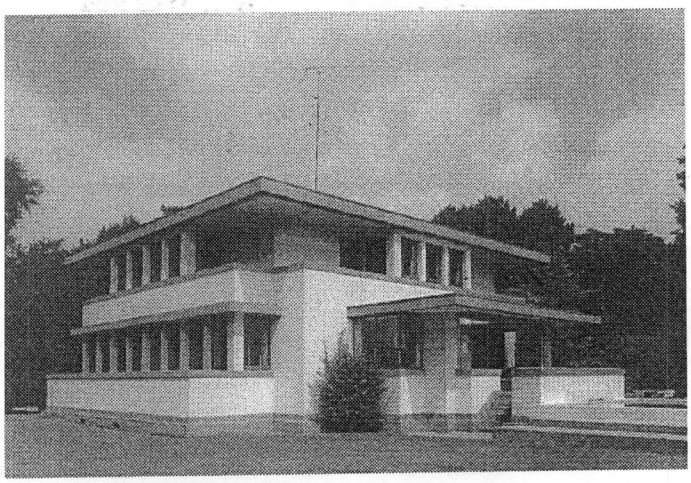
A significantly small number of the architectural proponents of De Stijl were able to give meaningful three-dimensional expression to the pictorial innovations of Neo-Plasticism. There are but a handful of examples that demonstrate convincingly the tectonic transformation of neo-plastic painting. Guedes (1988: 23) makes the following uncanny observation:

> "De Stijl was the movement in which painting and architecture came the closest to each other, but because of that very literal similarity it spent all its vitality in that one wonderful building, Rietveld's Schröder House."

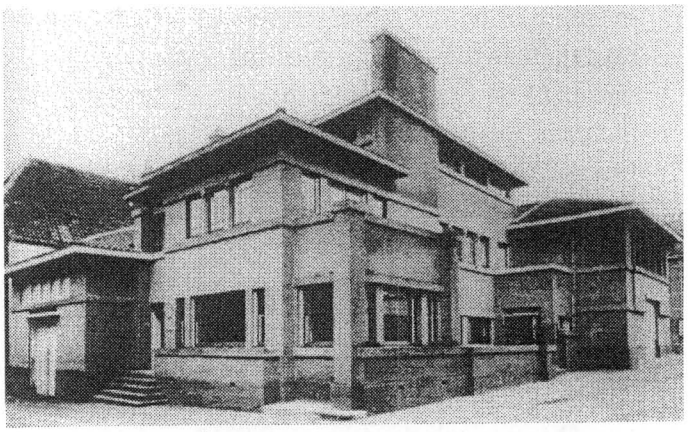
However brief and seemingly cohesive in terms of principled pursuit, the De Stijl movement was also in a constant state of flux and subjected to diverse external influences, which continually changed its architectural character. Despite these dilemmas, coupled with the difficulty to confine the architectural component of De Stijl to a number of general characteristics, it was undoubtably one of the finest examples of the architectural metamorphosis of modern art.



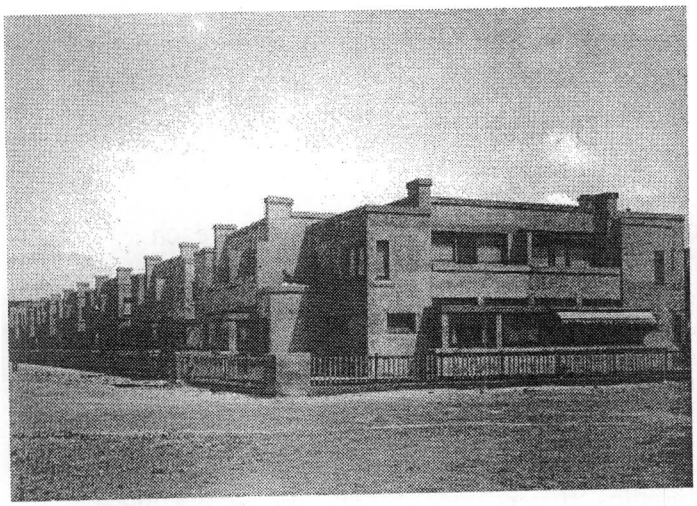
10.1 Wright, Robie House, Chicago (1909).



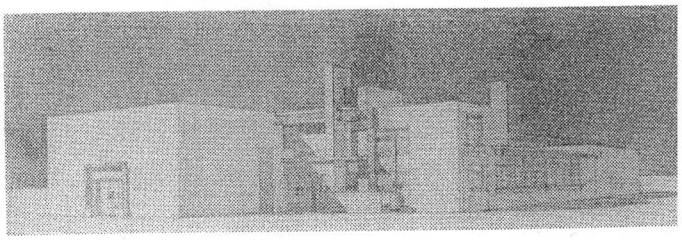
10.2 Van't Hoff, Villa Henny, Huis ter Heide (1919/20).



10.3 Wils, De Dubbele Sleutel, Woerden (1918).



10.4 Wils, Daal en Berg Housing Estate, Papaverhof (1922).



10.5 Oud, Purmerend Factory, project (1919).

This enquiry reviews specifically those examples that demonstrate best the tectonic incarnation of neo-plastic painting.

10.3 THE GENESIS OF NEO-PLASTIC ARCHITECTURE

The architectural component of De Stijl can be divided into three distinct stages. The incubatory period was dominated by the influence of Wright, which can be extended as far back as the conception of Villa Henny, Huis ter Heide, by Van't Hoff in 1914, and lasted until the end of 1920. The second stage, from 1921 until 1924, can be regarded the zenith of De Stijl and reflects the period of aesthetic consolidation and implementation, culminating in the Schröder-Schräder House, Utrecht. The third phase, from 1925 until the death of Van Doesburg in 1931, was a period of transformation and disintegration, marked by outside influences.

10.3.1 Formative Period (1914-1920)

10.3.1.1 The Wrightian Precedent

The earliest investigations conducted by the architectural contingent of De Stijl – Van't Hoff, Wils and Oud – were initiated independently from the pioneering pictorial investigations of Mondrian and Van der Leck. Instead, architectural impetus was derived from the leading Dutch architect at the time, Hendrik Petrus Berlage – a protagonist of Viollet-le-Duc's call for an architectural idiom that responded to the prevailing *Zeitgeist*, and of the work and theories of Wright.

Wright enjoyed widespread currency in Europe since the publication of the famous Wasmund editions on his *œuvre* in 1910 and 1911. He was one of the few architects whose buildings displayed a formal, spatial and technical resolution that responded to the demands and prospects of his age, hence the enthusiastic reception abroad. The unmistakable influence of his Robie Houses, Chicago (1900-1909, *fig. 10.1*), and Unity Temple, Oak Park (1906), made its first appearance in Van't Hoff's widely publicized Villa Henny (or Betonhuis, *fig. 10.2*), completed in 1919. [1] The Wrightian precedent was also evidenced by Wils's remodelling of the hotel, De Dubbele Sleutel, Woerden (1918, *fig. 10.3*); his Daal en Berg Housing Estate, Papaverhof (1922, *fig. 10.4*); and Oud's project, the Purmerend Factory (1919, *fig. 10.5*).

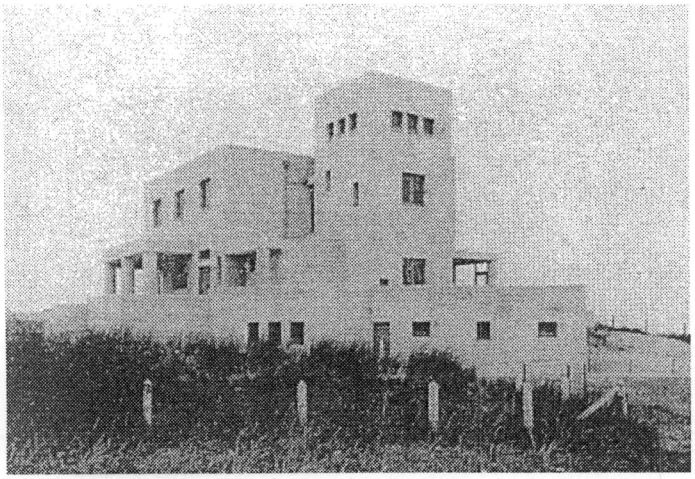
Wright's architecture appealed to the signatories of De Stijl because it displayed certain characteristics that concurred with the aesthetic cosmogony of Neo-Plasticism, thereby entrenching the Wrightian precedent as design rationale:

> 1. Wright's work demonstrated a formal modulation that coincided with the geometric investigations of neo-plastic painting. On the authority of Weston (1996: 96), Oud wrote in the 1918 that Wright "had laid the basis of a new plasticism in architecture. The masses shoot about in all directions ... In the interpenetration of planes the way has been cleared for the new plasticism." [2]
>
> 2. Wright's emphasis on the horizontal – the supposed line of domesticity and complementary to the flat Mid-Western landscape – served as an appropriate architectural analogy for the metaphysical attributes ascribed to the orthogonal and perpendicular by Blavatsky and Schoenmaeckers. (It was also a relevant model for the equally flat Dutch landscape.)

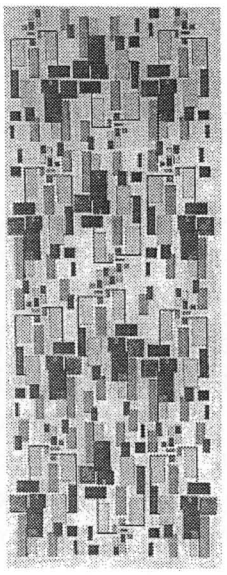
---

1 Weston, R., 1996, *Modernism* (London: Phaidon), 95, claims that Van't Hoff had worked for Wright in 1913, whereas Warnecke, C-P., 1991, *De Stijl 1917-1931* (Cologne: Benedict-Taschen), 208, mentions that he had only met him briefly on his sojourn to the USA.

2 Assumed quoted from one of Oud's series of articles, entitled "Architectonische Beschouwing", published in *De Stijl* during the course of 1918.



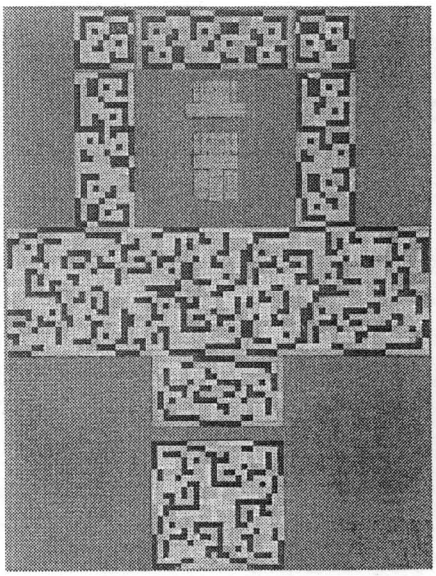
10.6 Oud, Menso Onnes (q.v.) & Van Doesburg, Villa Allegonda, Katwijk aan Zee (1917).



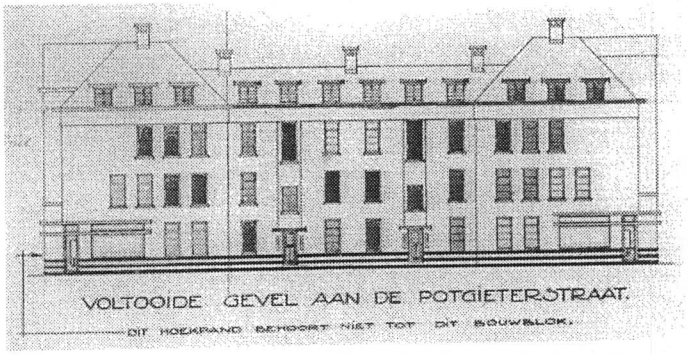
10.7 Villa Allegonda: study for stained glass window by Van Doesburg.



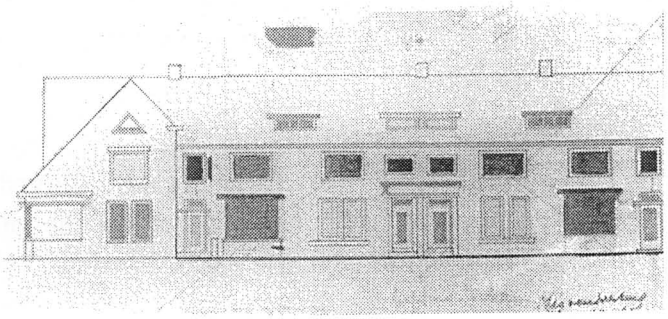
10.8 Oud & Van Doesburg, De Vonk Holiday Residence, Noordwijkerhout (1918).



10.9 De Vonk Holiday Residence: floor pattern by Van Doesburg.



10.10 Oud & Van Doesburg, Spangen Council Housing, Rotterdam (1920/1).



10.11 Boer & Van Doesburg, Torenstraat Row Houses, Drachten (1922).

3. Wright's commitment to the design of the entire building environment – encompassed in his so-called organic approach to architecture [3] – coincided with, if not pre-empted, Van Doesburg's vision of a interdisciplinary aesthetic movement of Dutch origin.

To paraphrase, in the words of Banham (1960; 1996: 150):

> "This common rectilinear character (so strongly felt by Van Doesburg that he had thought of calling the magazine by some titles as 'The Straight Line', before opting for the Berlagian 'de Stijl') was to some extent the product of an almost anti-historical set of circumstances; on the one hand, the architects working on Berlagian and Wrightian precepts had arrived at a simple formula of plain vertical walls and flat roofs, free from decorative elements; on the other hand Mondriaan, and possibly other painters as well, inspired by the rectilinear cosmogony of the theosophist Scoenmaekers, was on the point of arriving at an equally simple formula of rectangular patches of colour framed in horizontal and vertical lines, and free from figurative elements. Given this, it was suddenly and visibly possible, in Berlage's phrase to have a style again ..."

Ever since the inception of De Stijl, the collaboration between the artists and architects remained a consistent feature of the movement, expanding its universal premises way beyond the fine arts arena. During its formative years, Van Doesburg joined forces with architects Oud, Wils and Cees de Boer (1881-1966), and was responsible for the interior design of their buildings. These included Oud's remodelling of Villa Allegonda, Katwijk aan Zee (1917, *figs 10.6-10.7*); his De Vonk Holiday Residence, Noordwijkerhout (1918, *figs 10.8-10.9*); and the Spangen Council Housing, Rotterdam (1921, *fig. 10.10*). Van Doesburg also collaborated with Wils on Villa de Lange, Alkmaar; Villa De Kaperton, Bergmeer (both designed during the late 1910s); and De Dubbele Sleutel; in addition to Boer's conventionally designed Torenstraat Row Houses and School of Agriculture, both in Drachten, Friesland (1921/2, *fig. 10.11*). Huszár, in turn, worked closely with architect Pieter Klaarhamer (1874-1954) and industrial designer Piet Zwart (1885-1977) on the interiors and furnishing of Villa Arendshoewe, Voorburg (1921), for client Cornelis Bruynzeel Jr (*figs 10.12-10.13*).

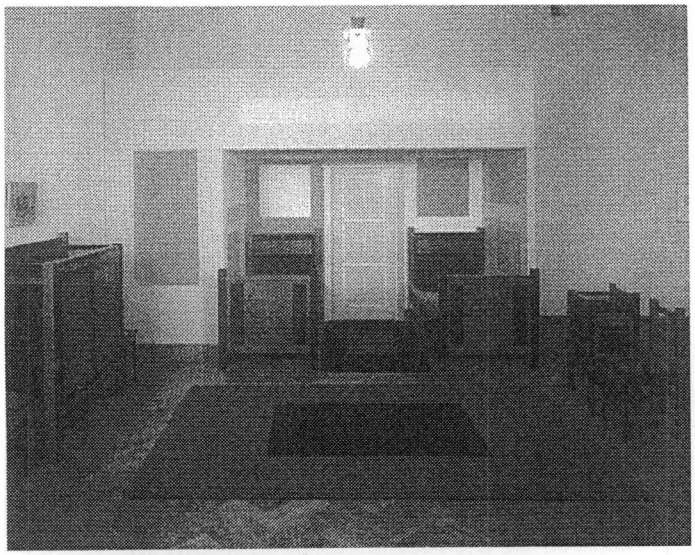
Judging from vintage photographs and despite extensive (if not exhaustive) theorizing, [4] Van Doesburg's input – restricted to the design of stained glass windows, geometric floor patterns, and interior and exterior colour schemes – appears disjointed, if not somewhat tentative. Warnecke (1991: 111) is quick to point out that the designers were more often than not restricted by the conservative taste of their clients. [5] The collaboration between Huszár, Klaarhamer and Zwart displays a greater degree of design synthesis and a more coherent application of the De Stijl vocabulary.

---

3 Wright's definition of organic architecture reads: "In Organic Architecture then, it is quite impossible to consider the building environment as one thing, its furnishings as another and its setting and environment still another. The spirit in which these buildings are conceived sees all of these together at work as one thing", cited from Wright, F. L., 1910, "Organic Architecture"; reprinted in Conrads, U. (ed.), 1970 ed., *Programs and Manifestoes of 20th-century Architecture*, trans. Humphries, L. (Cambridge, Mass.: MIT Press), 25. See also Wright, F. L., 1992., *Frank Lloyd Wright Collective Writings*, ed. Pfeiffer, B. (New York.: Rizzoli).

4 See Doig, A., 1986, *Van Doesburg: Painting into Architecture, Theory into Practice* (Cambridge: Cambridge Univ. Press), 58-105, for an comprehensive review on Van Doesburg's theories on colour and design during those formative years.

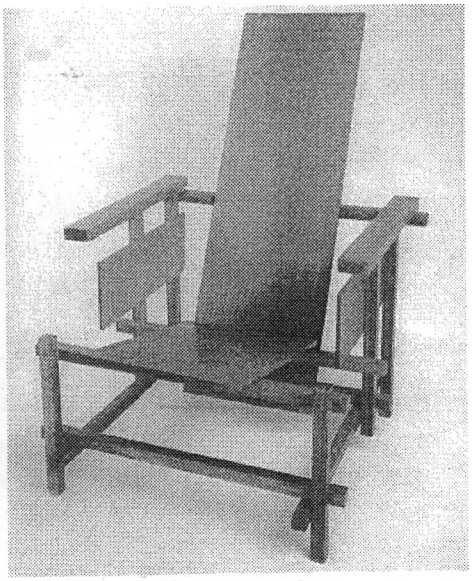
5 The unorthodox palette of De Stijl often met with hostile reception. Van Doesburg's colour scheme for Torenstraat Row Housing resulted in the inhabitants' scornfully referring to it as *Papageienbuurt* (Parrot Neighbourhood) and promptly had it repainted.



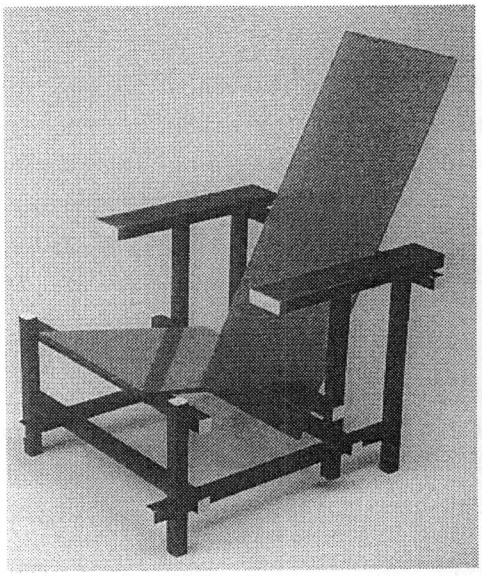
10.12 Klaarhamer, Zwart & Huszár, Villa de Arendshoeve, Voorburg (1921, reconstruction).



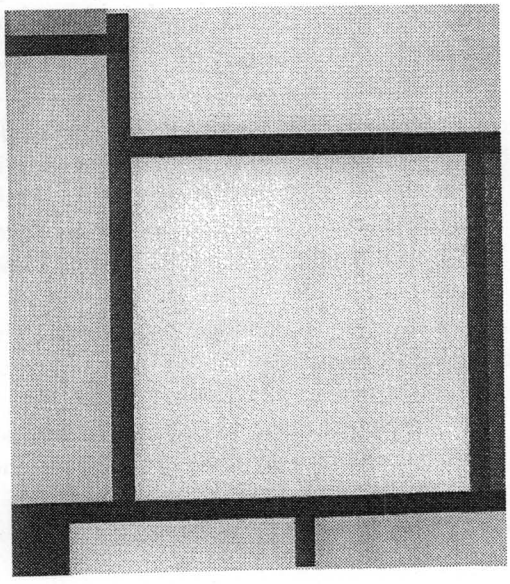
10.13 Klaarhamer, Zwart & Huszár, Villa de Arendshoeve, Voorburg (1921, vintage photo).



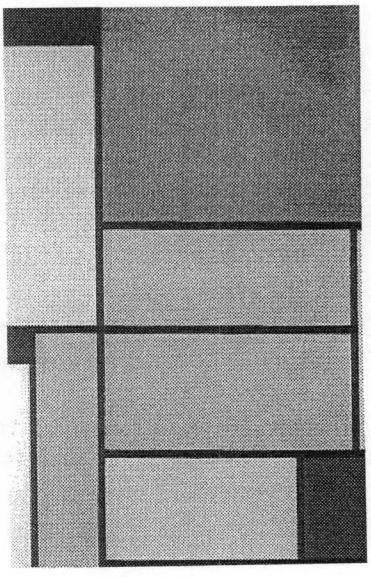
10.14 Rietveld, original version of the *Red-Blue Chair* (1917/8).



10.15 Rietveld, *Red-Blue Chair* (1917/8-1925).



10.16 Mondrian, *Composition with Red, Yellow and Blue* (1921).



10.17 Mondrian, *Tableau 1* (1921).

From a spatial and formal point of view, these incubatory projects of De Stijl were insignificant, mostly symmetrically organized, and made no particular contribution to modern architecture. They were either Wrightian in character, or of conventional appearance, with the neo-plastic geometric patterning and primary – and at that stage often secondary [6] – colours applied as an independent means of decoration. However hesitant and inconsistent, these early design collaborations generated intense theoretical discourse as communicated so insolently in their journal. They also played a cardinal role in the history of the movement, resulting in the discovery of the design talents of Gerrit Rietveld – the seminal De Stijl practitioner.

10.3.1.2 Rietveld's Contribution

Rietveld, a carpenter by training, attended a part-time course in architecture, presented by Klaarhamer at the Utrecht School of Applied Arts during the early 1910s. Since 1915, Rietveld had been commissioned by Van't Hoff to design furniture for his houses at Huis ter Heide according to designs by Wright. These joint initiatives culminated in his renowned, and retrospectively titled, *Red-Blue Chair* of either 1917 or 1918 (*figs 10.14-10.15*).

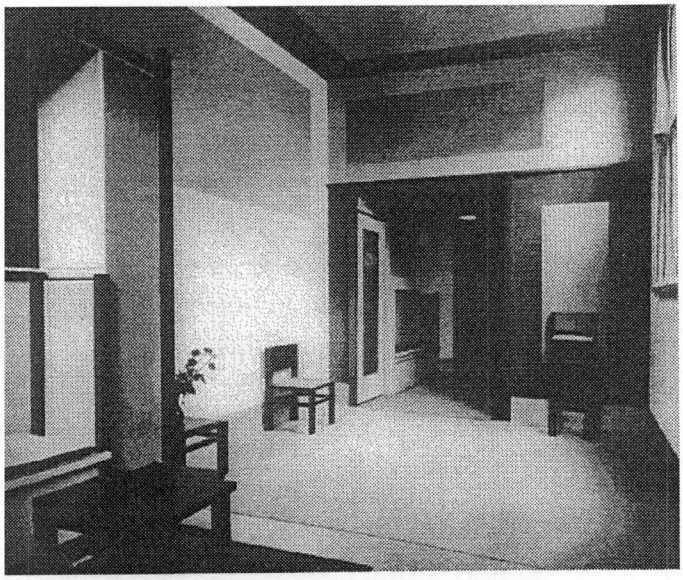
The exact circumstances pertaining to the genesis of this particular chair remain unclear. Frampton (1968; 1991: 145-146) is adamant the chair was modelled on a Victorian bed-chair and not any Wrightian precedent. The influence of De Stijl is equally debatable. Rietveld may have been familiarized with the aesthetic premises of Neo-Plasticism via Van't Hoff and Klaarhamer. He even met Van Der Leck in 1918 whose pictorial innovations could have honed his aesthetic sensibilities and stimulated the chair's conception, depending on when it was actually designed. Other sources maintain that it was a completely independent undertaking as Rietveld encountered Van Doesburg and the De Stijl initiative, in their opinion, one year after the chair's realization. There is, though, consensus that the unpainted timber chair only appeared in its final format (without the side panels under the arm rests and sporting the emblematic primary colour range) in 1923 – four years after Rietveld's official association with De Stijl in 1919.

Regardless of whether or not this chair was a calculated response to any predetermined neo-plastic principles, it gave three-dimensional expression to numerous aspects with which the neo-plastic artists had been wrestling. This simple piece of furniture – consisting of two planes framed by a linear structure – spontaneously recalled Mondrian's elemental compositions (*figs 10.16-10.17*). The overlapping method used in the jointing of both the frame and the seating ensured that no clearly delineated sense of space was created. Instead, it created the impression of the object extending itself infinitely into space. The chair was also economical in its method of construction, presumably machine-made and ideally suitable for mass-production – the quintessential expression of its age. These factors contributed collectively to its positive reception, prompt publication in *De Stijl* and adoption as the ultimate utilitarian emblem of the movement. Warnecke (1991: 126) concurs:

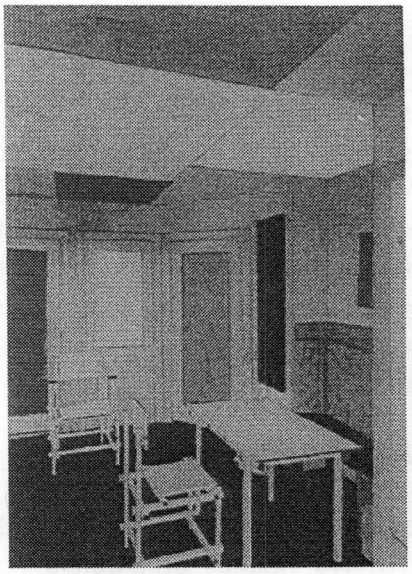
> "With this dialectical construction Rietveld applied the basic principle of De Stijl art – the harmonization of opposites in the transcendence of space – and created a perfect structure that is more than a piece of furniture ... Unlike any other item, this chair unites elements of both formal and functional De Stijl ideals. It is both a work of art and an object for daily use, thus demonstrating the utopian vision of a different, yet ideal way of modelling the environment. It was the concrete rendering of a utopian idea, which explains why van Doesburg was so enthusiastic about it, hailing it is an excellent example of De Stijl art."

---

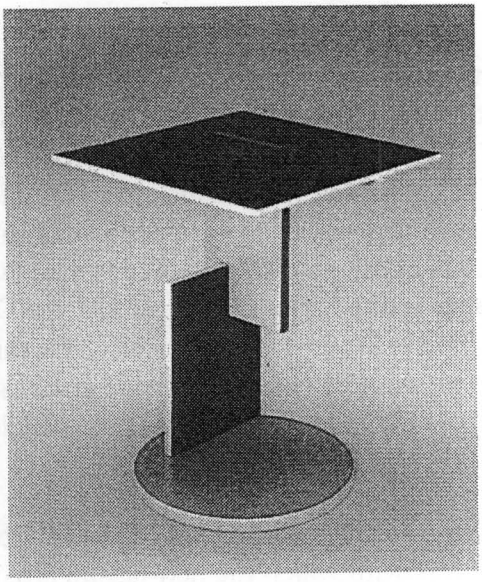
6 Warnecke (1991: 130) mentions that Van Doesburg later altered some of his drawings that sported secondary (instead of primary) colours, creating the false impression that De Stijl was a coherent movement right from the start.



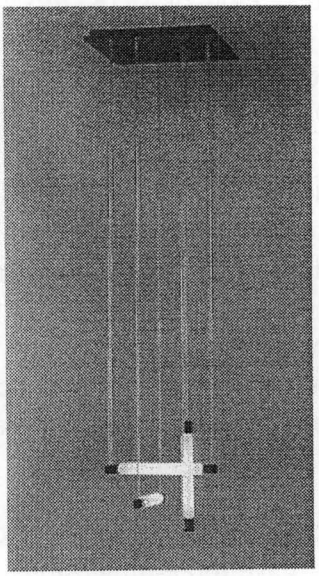
10.18 Wils, Huszár & Rietveld, Berssenbrugge Photographic Studio, The Hague (1921).



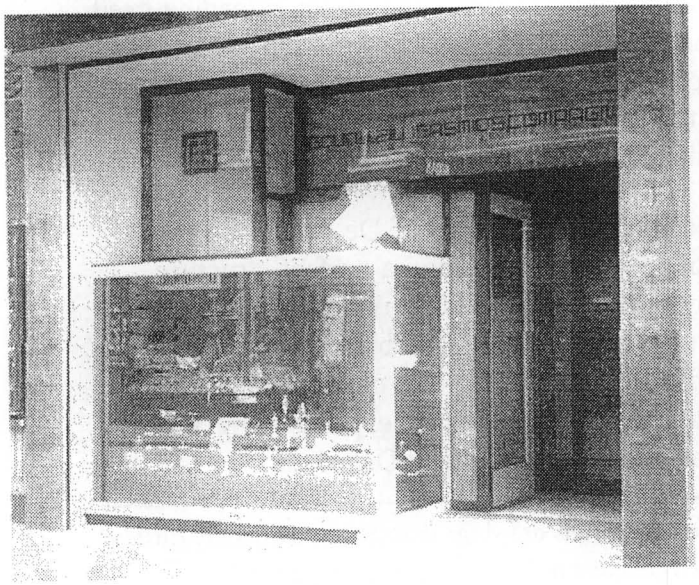
10.19 Van Doesburg & Rietveld, House Bart van der Ligt, Katwijk aan Zee (1924).



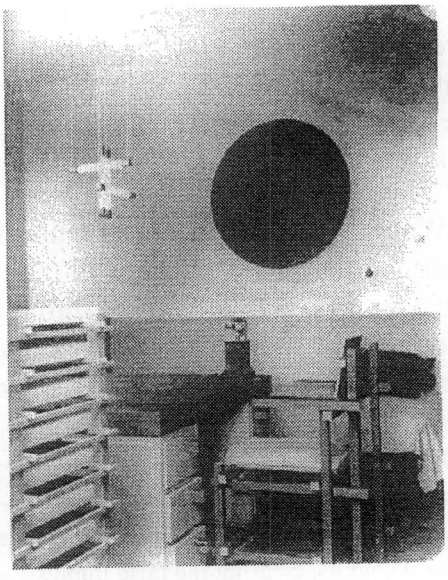
10.20 Rietveld, *Side-Table* (1923).



10.21 Rietveld, *Hanging Lamp* (1922).



10.22 Rietveld, G. Z. C. Jewellery Shop, Amsterdam (1921).



10.23 Rietveld, Hartog Surgery, Maarssen (1923).

Frampton (1968; 1991: 146) adds:

> "With this chair Rietveld also demonstrated for the first time an open architectonic spatial organization which was not only appropriate to the broader cultural programme of the movement, but also an aesthetic manifestly free from the influence of Wright."

Rietveld's subsequent recruitment as a member of De Stijl led to a fruitful period of interdisciplinary interaction and resulted in one of the most remarkable demonstrations of the synthesis between the pictorial and utilitarian arts. During the next couple of years, Rietveld not only furthered his ingeniously simple overlapping method of construction, but his ensuing pieces of furniture – including lamp fittings – were conscious responses to the plastic principles of De Stijl that Van Doesburg was canonizing so earnestly.

10.3.2 The Zenith of Neo-Plastic Architecture (1921-1924)

10.3.2.1 Gesamtkunstwerk

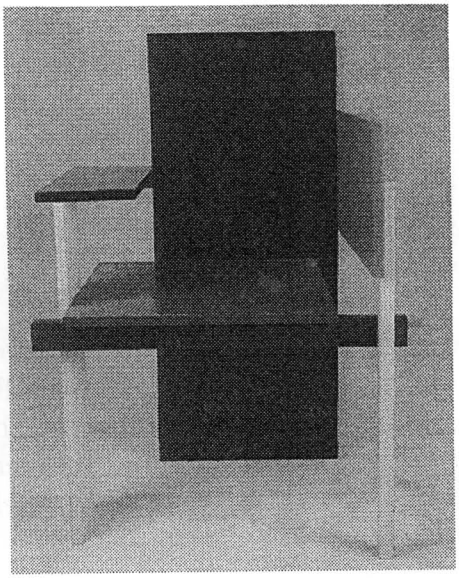
Rietveld's carpentry skills were quickly put to the test by the De Stijl signatories. His furniture featured prominently in the show apartment of Oud's Spangen Council Housing (1920/1); the Berssenbrugge Photographic Studio, The Hague, designed by Wils and decorated by Huszár (1921, *fig. 10.18*); and the interiors designed by Van Doesburg for House Bart van der Ligt, Katwijk aan Zee (1924, *fig. 10.19*). These interactions must have stimulated the continual refinement and adaptation of Rietveld's designs. By the end of 1921, Rietveld's initial symmetrical pieces of furniture had given way to a series of asymmetrical and de-centred designs that demonstrated unequivocally the influence of Mondrian's elemental compositions, which had by then reached its sanctioned format (*fig. 10.20*).

The design of the shop-front, furniture and interior of the G. Z. C. Jewellery Shop, Amsterdam (1921, *fig. 10.22*), and the remodelling of the Hartog Surgery, Maarssen (1922, *fig. 10.23*), were Rietveld's first independent architectural commissions. Frampton (1968; 1991: 146) is of the opinion that the Hartog Surgery was one of the seminal works in Rietveld's *œuvre* since it suggested a "fully three-dimensional coordinate system" in which "each piece of furniture, including the suspended light fitting, was fully 'elementarized' as it were, and the effect was at once to suggest an infinite series of planes in space, both horizontally and vertically". The Hartog Surgery also featured Rietveld's famous *Hanging Lamp* (*fig. 10.21*), which was, yet again, an ingenious piece of design, capturing the spatial and plastic intentions of elemental painting in a remarkably simple manner.

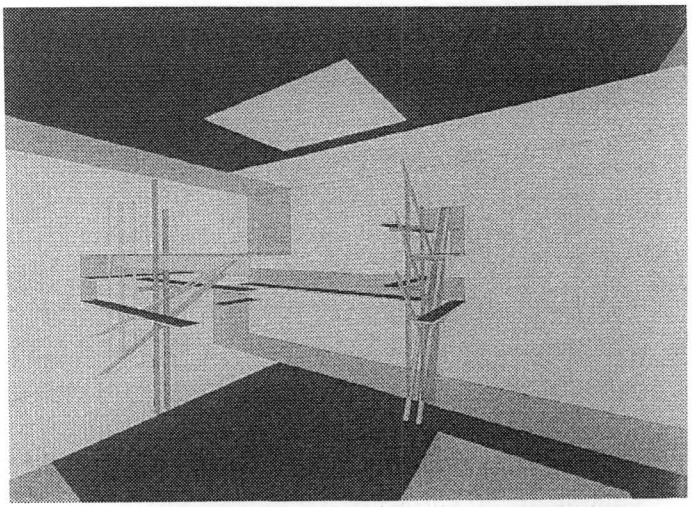
Rietveld's *Berlin Chair* (*fig. 10.24*) – specially designed for the "Grosse-Berliner Kunstausstellung" of 1923 and displayed in a complementary De Stijl environment created together with Huszár – was another demonstration of Rietveld's intrinsic understanding of Neo-Plasticism. This particular chair is to some extent even superior to the *Red-Blue Chair*, particularly with respect to its asymmetrical constitution which exudes a dynamic, though delicate, sense of balance.

With the exception of Zwart's Exhibition Stand for the Eerste Nederlandsche Celluloidfabrieken of 1921 (*fig. 10.25*) – obviously modelled on Rietveld's designs – none of the other De Stijl signatories seemed to have internalized, or foreseen, the full significance of these modest pieces of elemental furniture. Oud, serves as a case in point.

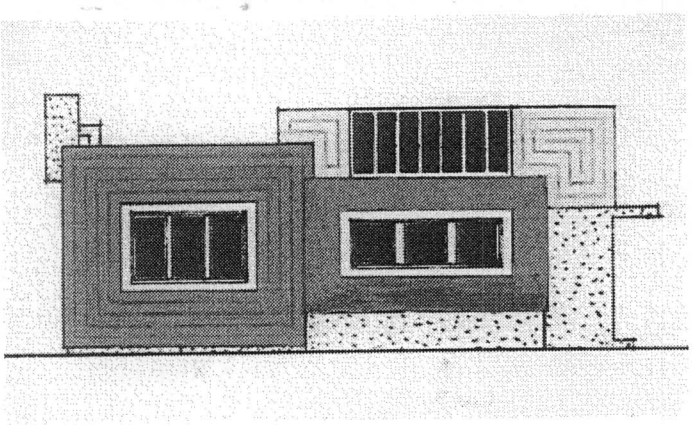
Oud's association with De Stijl remains enigmatic. On the one hand, he was an important contributor to the theoretical content of the movement during its formative years. On the other hand, he had already distanced himself from the movement in the autumn of 1921. This resulted from a disagreement with Van Doesburg over the artists' proposed colour scheme for Oud's Spangen Council Housing (Warnecke, 1991: 104). Paradoxically, Oud's architecture produced immediately after his resignation from De Stijl demonstrated a far greater degree of neo-plastic influence than any of his



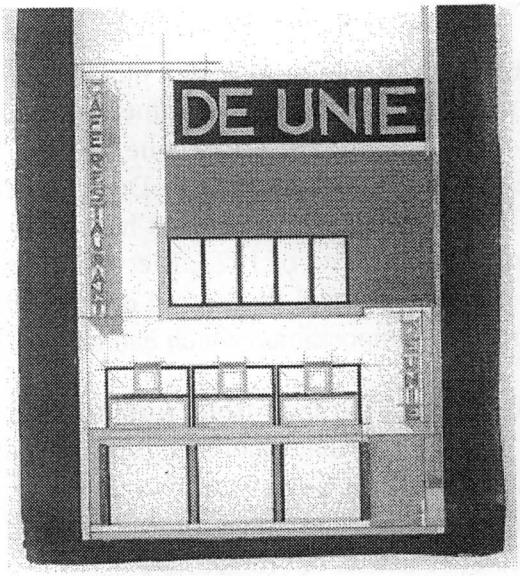
10.24 Rietveld, *Berlin Chair* (1923).



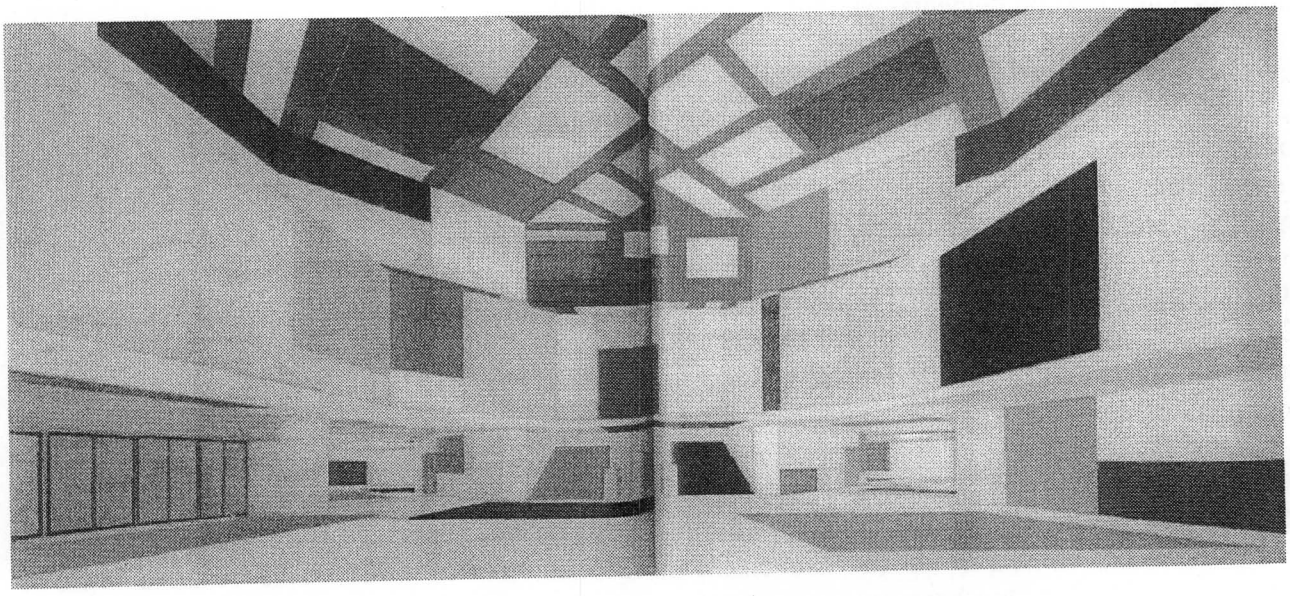
10.25 Zwart, exhibition stand for Eerste Nederlandsche Celluloidfabrieken (1921).



10.26 Oud, Project Manager's House, Oud-Mathenesse (1923).



10.27 Oud, Café de Unie, Rotterdam (1924).



10.28 Van Doesburg, Amsterdam University Hall, project (1923).

earlier designs. If the Project Manager's House, Oud-Mathenesse (1923, *fig. 10.26*), still owed much to Wright (despite its distinctive De Stijl colour scheme), Café de Unie, Rotterdam (1924, *fig. 10.27*), was clearly indebted to the elemental compositions of Mondrian (*fig. 10.27*). Robert Welsh (1982; 1988: 37) concurs:

> "Family tradition rightly maintains that Oud consulted his small but significant personal collection of Mondrian's paintings – like a devotee of contemplation – in order to find a sense of balance that would produce similarly harmonious results in his own designs."

This façade is a fine example of the attention given the structuring of an elevation in accordance with the compositional principles of neo-plastic painting, though, lacking the modulation so pertinent to Rietveld's designs.

10.3.2.2 International Dissemination of De Stijl

By the end of 1921, the original constitution of the movement had changed dramatically. Apart from Oud and Van der Leck (who had already disassociated himself from the movement in March 1918), Vantongerloo, Van't Hoff and Kok had all by then resigned. [7] Mondrian, although still committed to the De Stijl initiative, had established himself in Paris, whereas Rietveld had started to practise in all earnestness. Van Doesburg, the peripatetic propagandist of the movement, was effectively on his own.

Van Doesburg subsequently recruited new members, mostly from abroad. In 1922, membership was extended to Lissitzky (whom Van Doesburg had met the year before), recently graduated Dutch architect Cor van Eesteren (1897-1988) and German film-maker Hans Richter (1888-1976). Austrian architect and theatre designer Frederick Kiesler (q.v.) from the G Group was recruited in 1923, and Dutch artist and sculptor César Domela (1900-q.v.) in 1924. Pioneering Dadaists Jean [Hans] Arp (1887-1966) and his wife, Sophie Tauber-Arp (1889-1943), joined in 1926, together with a few others, including Brancusi after Mondrian's resignation in 1925.

However, Van Doesburg's brief interlude of solitary operation, coupled with his controversial visits to the Bauhaus (in December 1920 and again in February 1922), must have forced him to consolidate and reflect on his own aesthetic achievements. His self-created teaching opportunity – presenting a "Stijl Course" independent from the Bauhaus in Weimar [8] – and his acquaintance with both Lissitzky and Van Eesteren contributed substantially to the sudden growth evident in his work.

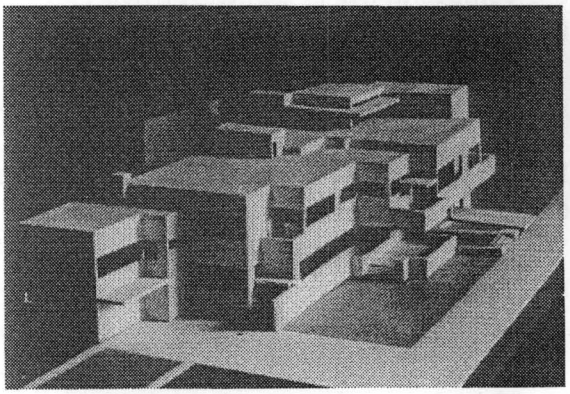
---

7 According to Banham, R., 1960; 1996, *Theory and Design in the First Machine Age* (Cambridge, Mass.: MIT, Press), 149-150, Van Der Leck was vehemently opposed to the union of architecture and painting, as he felt that the pictorial arts would assume a subservient position. Like Picasso and Braque, Van der Leck also preferred to apply the process of abstraction to a naturalistic starting point and to remain recognizable as such. Inevitably, these points of view brought him into conflict with Mondrian and Van Doesburg, and he resigned from the Stijl initiative one year after its founding. Evidently, the inflexibility and absolutest dogma of De Stijl prompted the resignation of Huszár (who sporadically rejoined), Wils and Van't Hoff and in 1919, and Vantongerloo and Kok in 1921.

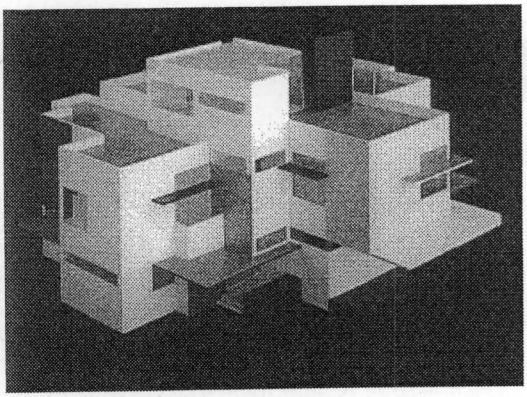
8 Frampton, K., 1968, "De Stijl"; reprinted in Stangos, N. (ed.), 1991 ed., *Concepts of Modern Art* (London: Thames & Hudson), 147, maintains that Van Doesburg offered tuition in painting, architecture and, surprisingly, sculpture. With the exception of the De Stijl sculptors, Vantongerloo and Domela, no examples of any sculptures by Van Doesburg or his students have as yet been encountered to corroborate Frampton's claim. Doig (1986: 128-129) refers to collages "of strong mechanical overtones" which Van Doesburg and Kurt Schwitters produced, assumingly in 1923, but the author did not provide any further information.



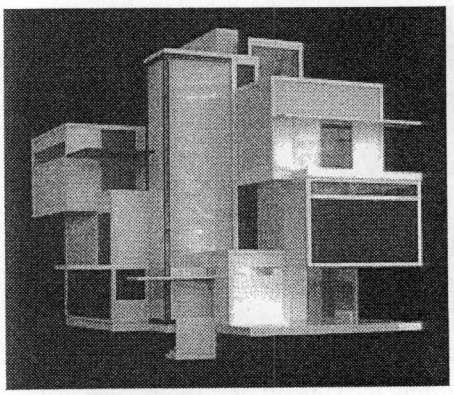
10.29 Vintage photograph, *Les Architects du Groupe De Stijl* at Galerie d'Effort Moderne, Paris (1923).



10.30 Van Doesburg & Van Eesteren, Maison Rosenberg, project (1923).



10.31 Van Doesburg & Van Eesteren, Maison Particulière, project (1923, reconstruction).



10.32 Van Doesburg & Van Eesteren, Maison Artiste, project (1923, reconstruction).

Through his contact with Lissitzky, Van Doesburg was exposed to the aesthetic initiatives of the Soviets, [9] whose work was not only regularly published in *De Stijl*, but influenced conspicuously his own approach to design. After joining forces with Van Eesteren, whom he had met in Weimar in 1922, Van Doesburg had finally arrived at a more integrated application of the De Stijl aesthetic in an architectural context. This is immediately apparent from his proposal for the interior of the University Hall, Amsterdam (1923) – a reworking of the final-year thesis project of Van Eesteren (*fig. 10.28*). Obviously modelled after Lissitzky's Prouns, the geometric ensemble and emblematic De Stijl colour scheme had been extended to all the surfaces of the building envelope – including the ceiling – and aimed at a dissolution of the interior space through colour and planar treatment. Frampton (1968; 1991: 149) contends:

> "Van Doesburg's work, in any case, was never the same after his initial encounter with Lissitzky in 1921. No further evidence is needed than the drawings he and Van Esteren [*sic*] began to produce in the following year – axonometric or hypothetical architectural constructs in which major planar elements engender a shoal of secondary planes which nebulously appear to float in space about their respective centres of gravity. These works can surely only be seen as a direct De Stijl response to the challenge of the spatially evocative Proun style invented by El Lissitzky in 1920."

10.3.2.3 Exhibition les Architects du Groupe De Stijl

The retrospective "Exhibition Les Architects du Groupe De Stijl", hosted by Léonce Rosenberg at the Galerie L'Effort Moderne in Paris from 15 October to 15 November 1923 (*fig. 10.29*), was a unique occasion for the disparate group to consolidate their efforts. It also provided Van Doesburg and Van Eesteren with an opportunity to further their joint efforts. [10] The three projects specially prepared for the exhibition, Maison Rosenberg (Hotel Particulier, *fig. 10.30*), Maison Particulière (*fig. 10.31*) and Maison d'Artiste (*fig. 10.32*) – and the accompanying axonometric drawings (*figs 10-38-10.41*), in particular – are testimony to Van Doesburg's honed tectonic insights that resulted from his exposure to Suprematism and Constructivism.

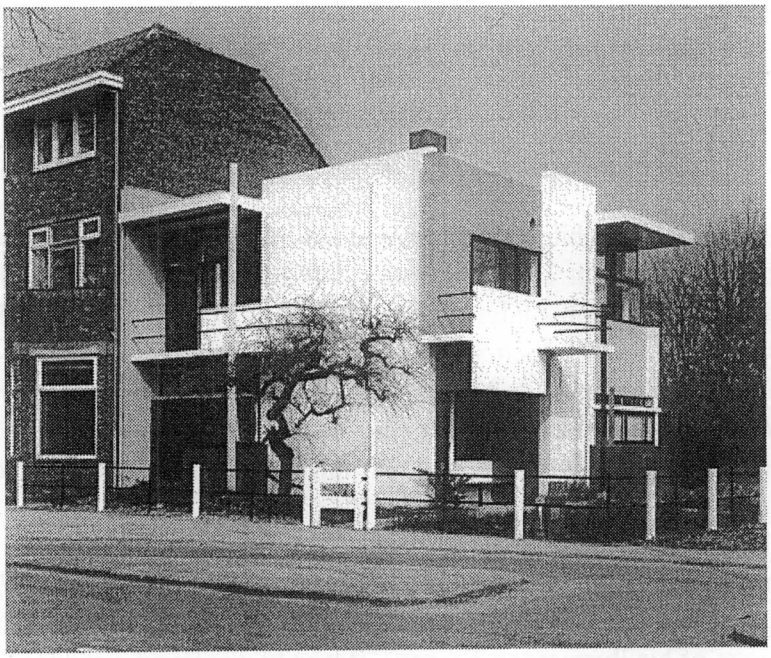
The other Dutch participants included Oud, Huszár, Rietveld, Wils, Zwart and Willem van Leusden (1886-1930) – a fine artist who turned his attention to architecture in 1922. Oud exhibited seven projects, including drawings of his Purmerend Factory. Rietveld displayed a model of his design for the G. Z. C. Jewellery Shop, and Huszár and Zwart submitted, "amongst other projects", a design for a women's residence (Warnecke, 1991: 162). Significantly, Mies was invited to join the exhibition. Warnecke (*ibid.*: 167), however, claims that Van Doesburg prohibited Mies from displaying his renowned Brick Country House (project, 1922/3), since it might have upstaged his own designs. As a result, Mies only exhibited drawings of his skyscraper projects.

This exhibition was an important barometer in the development of neo-plastic architecture. It foremost presented Van Doesburg, together with Van Eesteren, with the opportunity to devise a viable design methodology from artistic premises. It also enabled Van Doesburg to distil his own theories on architecture, which he communicated in a series of articles entitled "Diagnosis of Architecture: with Reference to the Architectural Exhibition of the De Stijl Group in Galerie Rosenberg, Paris". These

---

9 Warnecke (1991: 157) mentions that Lissitzky invited Van Doesburg to attend the "International Congress of Progressive [Modern] Artists", hosted in Düsseldorf from 29 to 31 May 1922. According to a published account on the exhibition in 1922 in *De Stijl*, vol. 5, no. 8, participants – representing most of the modern movements in Europe at the time – tended to gravitate to either a constructivist or an expressionist (reported as an "impulsivist") approach to art. Some months later, Van Doesburg hosted the "International Faction of Constructivists" in Weimar.

10 The collaboration between Van Doesburg and Van Eesteren was not as amicable as could be assumed. See Doig (1986: 149-153) for the controversies surrounding the authorship of their designs, which caused Van Eesteren considerable dissatisfaction.



10.33 Rietveld, Schröder-Schräder House, Utrecht (1924).

were soon followed by his seminal publication "Towards a Plastic Architecture" of 1924. In turn, the exhibition must have presented Rietveld with the opportunity to internalize and compare his progress with those of his colleagues, also exposing him to the spatial contributions of the Soviets via Van Doesburg's example. These reflections contributed undoubtably to his remarkable synthesis of neo-plastic experiments as demonstrated in the zenith of De Stijl – the Schröder-Schäder House (*fig. 10.33*), produced one year after the exhibition. This compact, though complex, building not only epitomized Van Doesburg's 16-point criteria, but indicated that neo-plastic architecture had finally come into its own.

10.4 FROM ELEMENTAL PAINTING TO ELEMENTAL CONSTRUCTION

10.4.1 Theoretical Impetus

From the outset, Van Doesburg, the evangelist of De Stijl, was adamant that architecture was an integral component of the movements' aesthetic agenda. In the first De Stijl manifesto of 1918, its signatories enunciated that "the organ *De Stijl*, founded for [the purpose of the formation of an international unity of life, art and culture], seeks to contribute towards setting the new conception of life in a clear light. This is possible by ... scientific, literary, architectural, literary [and] musical [contribution] ..." [11] Even though the architectural format of the movement had not yet been crystallized, this initial acknowledgement was important. Allan Doig (1986: 34) explains:

> "[Van Doesburg] won converts in many different aspects of the arts, and gradually De Stijl was welded into the spearhead of an ideal. His stress on the socialisation of art helps to explain his insistence on the inclusion of architects in the movement. Architecture provides the envelope for, and therefore shapes, the everyday life of the people. In this way it could be used as a powerful instrument of reform. Life within art was the end and architecture provided the 'environmental canvas' for the exploitation of the new means [of aesthetic expression]."

Concurring with the *Gesamtkunstwerk* ideal, it was imperative that the discourse of De Stijl would have been extended to architecture and, inevitably, address a latter-day means of expression. Apart from critical appraisals of Wright's work, the futurist visions of Sant'Elia received extensive coverage in their journal during those formative years. However, according to Doig (*ibid.*: 43, 45), Oud contended that futurist architecture had a "limited life-span", whereas Van Doesburg was of the opinion that Wright had not yet reached a "truly universal" design solution. Van Doesburg, in particular, was infinitely preoccupied with the transferral of the elemental (or elementary) approach of neo-plastic painting to architecture. He was convinced that it was possible to devise a type of architecture that – like abstract art – would be constituted entirely of rudimentary means, using, in the words of Doig (*ibid.*: 55), "its own technical [ends] towards the creation of a balanced unity, the synthesis of the aesthetic idea[l]." Van Doesburg was adamant that architecture had much to learn from painting. In the essay "Van Natuur tot Kompositie" (1919), he wrote:

> "Architecture as well as painting and sculpture, and for that matter even music, literature, and dance, display certain common features. We can see that architecture is gradually turning away from the arbitrary and picturesque, the capricious and disorderly, and is turning towards constructive necessity and mathematical order ... For years the same has been true of painting and sculpture. The result is that all the arts in the final analysis have the same problem to solve, whether on their own or together. This problem is the problem of balanced relationship, of creative harmony." [Emphasis as quoted.] (*ibid*: 5) [12]

---

11 Van Doesburg, T., Van't Hoff, R., Huszar, V., *et al.*, Nov. 1918, "'De Stijl': Manifesto I", *De Stijl*, vol. 2, no. 1; reprinted in Conrads (ed.), 1970 ed.: 39-40.

12 From Van Doesburg, T., Aug. 1919, "Van Natuur tot Kompositie", *De Hollandsche Revue*, vol. 26, no. 8

Oud shared similar sentiments in his essay entitled "Orientatie", published in the same year:

> "... the aesthetic value of a building [should be] determined by the purity of its relationships: the clarity of expression of space by masses, planes and lines; and eventually by the tension arising from its constructive plasticism and not from decoration. (Doig, 1986: 62) [13]

10.4.2 Colour, Composition and Space

In keeping with the polemics of the day, the "non-decorative" and "non-stylistic" were aspects that received considerable attention. The De Stijl proponents were of the opinion that colour was the new means of decoration, and ultimately considered a building material in its own right. Therefore, just as colour was regarded an autonomous subject matter in the pictorial arts, it was to assume a similar position in the architectural arena. Van Doesburg played a seminal role in this regard. The development of the use of colour in the architectural portfolio of De Stijl is particularly insightful, having evolved from an applied form of decoration to, in Van Doesburg's loaded words, where "one would have to learn to see the four walls as one plane" [*sic*] (*ibid.*: 56). [14]

In addition to the pivotal role of colour, composition was another important design consideration in achieving the desired plastic synthesis. The correlation between abstract art, musical theory, mathematics and architecture found numerous echoes in the early writings of De Stijl, with Van Doesburg even attempting a theory on the distribution of colour based on the proportions of the Golden Section. [15]

The depiction of pictorial depth, and by implication the notion of space, had been germane to the genesis of neo-plastic painting. Significantly, in an extract from an early book by Van Doesburg, *De Nieue Beweging in de Schilderkunst* (1917), the author referred to "plane" as the "symbol of space", which immediate suggested a distinctly architectural quality. He also provided a novel interpretation of space that was to find recondite expression in his own architectural experiments, warranting this lengthy quotation:

> "The Cubist ... extracts the mathematical from the natural form and in so doing retains the pure artistic form. This artistic form comes from within; this is the spiritual form; the spiritual form is the plastic; and the plastic is the pure. The Cubist is fully conscious of the plastic value which an object possess, but for him the object is the logical clarification of Space and therefore has a deeper, more philosophical meaning for him than for the Impressionist. The Cubist does not value 'space' above 'the plane', but rather has a different conception of space than that of the naturalistic painter. The plane is for the former [the Cubist] the symbol of Space, and each thing in this field of perception becomes the representation of this conception of Space. The point is therefore not to imitate or copy a section of actual Space as it was with the painters who used linear and atmospheric perspective, the point is to express the concept 'Space'." (*ibid.*: 83-84)

---

13 From Oud, J. J. P., Dec. 1919, "Orientatie", *De Stijl*, vol. 3, no. 2.

14 From Van Doesburg, T., Sept. 1919, "Moderne Wendingen in het Kunstonderwijs", *De Stijl*, vol. 2, no. 11.

15 Doig (1986: 86) states that Van Doesburg's interest in the "mathematics of colour" was greatly influenced by the work of the scientist Wilhelm Ostwald, as published in his book *Die Fabenfibel* of 1917. Yet, Doig (*ibid.*: 94) submits that Van Doesburg's interest in the Golden Section may have been a response to Le Corbusier's *tracés régulateurs*, since the first studies in this regard coincided with a reference in the March issue of De Stijl in 1921 to the receipt of *L'Esprit Nouveau*, no. 5, in which the article on regulating lines appears.

In architectural terms, Van Doesburg's reference to expressing space as a concept is highly significant since it described accurately his own on-going experiments with colour and surface (plane) in the attempt to both define and dissolve space. Yet, despite the cardinal role of space in the evolution of Neo-Plasticism, it is plausible to suggest that colour was ultimately the primary tectonic means with which the proponents of De Stijl gave expression to this "concept, Space" – a very specific and unique contribution made to the semantic development of Heroic Modernism, and which, as noted before, even prompted Le Corbusier to apply colour to the interiors of his buildings.

10.4.3 Towards Collective Construction

During the embryonic years of De Stijl, its theoretical content was replete with visions of a new kind of architecture (paradoxically, referred to "style-less"), that could be achieved with rudimentary means as exemplified by elemental painting. Doig (1986: 114) provides the following assessment of what can be considered the premise for neo-plastic architecture:

> "... the machine aesthetic had made decoration (in any way a very individualistic pursuit) an unnecessary self-indulgence. In this alternative the new materials, especially reinforced concrete, revealed the beauty of the smooth plane. Colour gained a special place through its emphasis of planar qualities and its ability to create relationships amongst the structural elements. The elementary means of architecture (the plane, colour, and mass) [were] controlled by the objective means of the mechanical aesthetic (proportion, measure, and function) [and] were brought to bear on the problem of creating a new society."

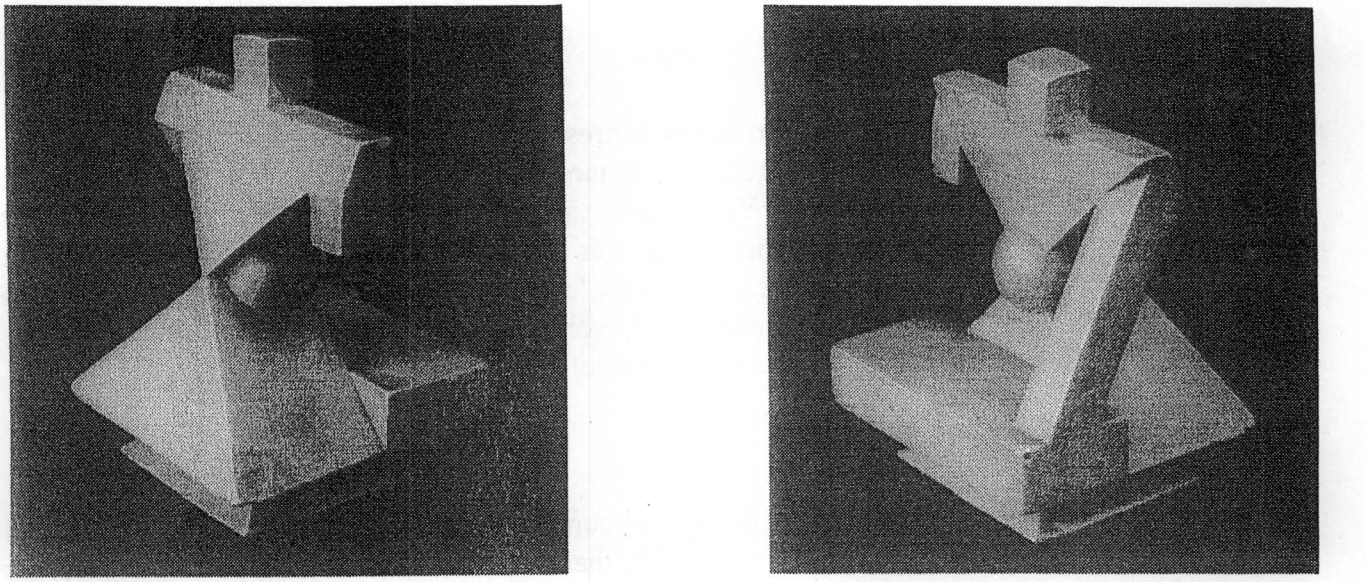
However, if Van Doesburg initially maintained that modern architecture could benefit greatly from the advances in the pictorial arts, he started, during the early 1920s, to turn his attention towards "collective construction". The fifth De Stijl manifesto, published in 1923 under the joint authorship of himself, Van Eesteren and Rietveld, was dedicated entirely to the collaboration between architect, sculptor and painter, and in which, as Van Der Leck had predicted, architecture had assumed the dominant position. Coinciding with the sentiments of their Soviet counterparts, the authors stated explicitly that "We have given colour its rightful place in architecture and we assert that painting separated from the architectonic construction (i. e. the picture) has no right to exist". [16] From a theoretical point of view, this statement was a milestone in the evolution of neo-plastic architecture since it addressed a number of cardinal of issues.

It foremost referred to the impact that constructivist ideology brought to bear on Van Doesburg, but, unlike the Soviets – Rodchenko, in particular – the dearth of painting was not politically motivated. Rather, it served as an acknowledgement of the impacting role of painting on the crystallization of neo-plastic architecture. More importantly, it implied that painting had been assimilated to such an extent that the ultimate aesthetic goal of "life within art" had been achieved.

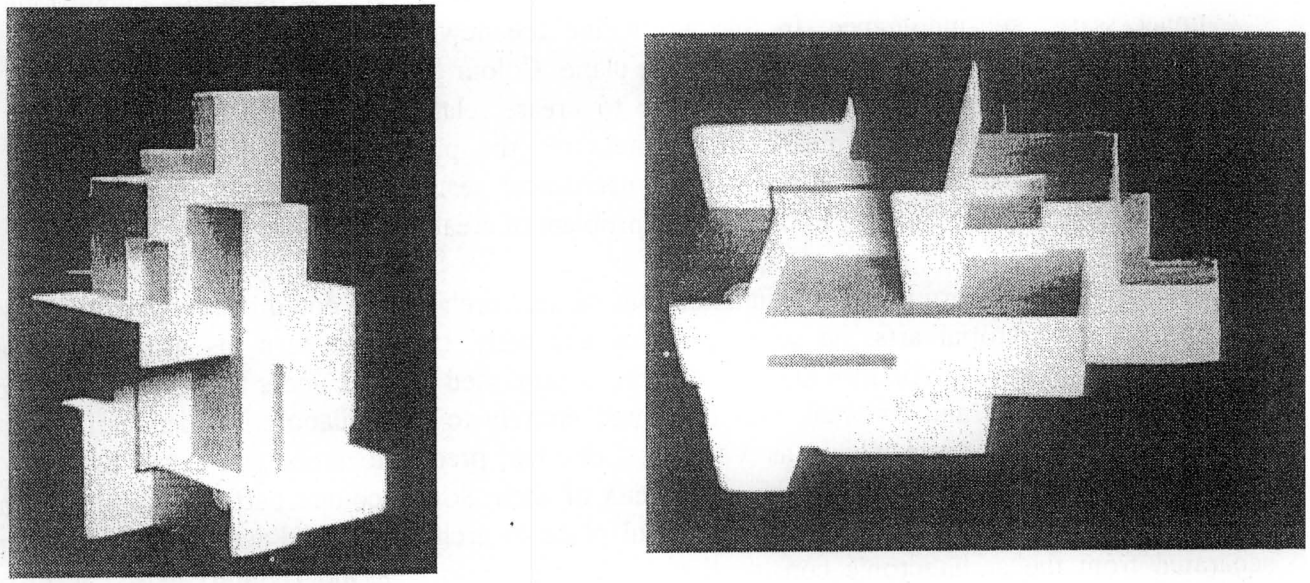
It is not clear whether this manifesto was prepared before of after the retrospective De Stijl exhibition, but one can assume that it must have concurred with Van Doesburg's and Van Eesteren's insights derived from their architectural explorations prepared for that occasion. Not surprisingly, Van Doesburg was, soon after, finally in a position to codify his 16-point criteria for neo-plastic architecture, though, seven years since the founding of the De Stijl initiative.

---

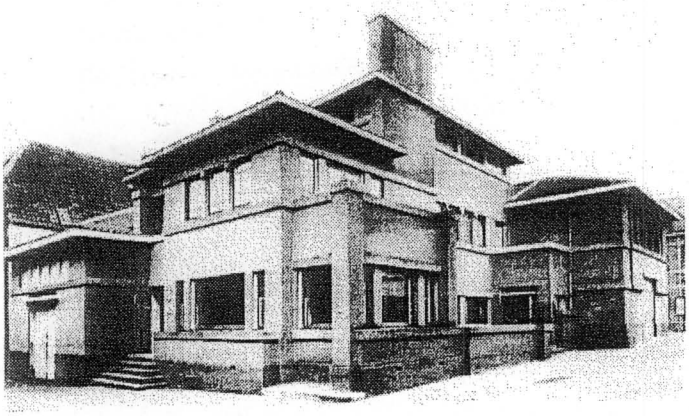
16 Van Doesburg, T., Van Eesteren, C., and Rietveld, G., 1923, "'De Stijl': Manifesto V: - □ + = R4 – Towards Collective Building [Construction]", De Stijl [n. no.]; reprinted in Conrads (ed.), 1970 ed.: 66.



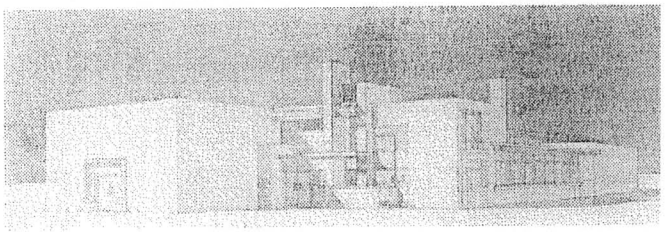
10.34 Vantongerloo, *Construction in a Sphere* (1918).



10.35 Vantongerloo, *Interrelation of Masses* (1919).



10.36 Wils, De Dubbele Sleutel, Woerden (1918).



10.37 Oud, Purmerend Factory, project (1919).

As indicated, the architectural component of De Stijl was a conflation of a coinciding set of circumstances, with seminal contributions – apart from its prolific theoreticians – made by individuals independent from, and initially even oblivious to, any neo-plastic conjectures. Yet, there is no doubt that the crystallization of neo-plastic architecture resulted from intent artistic experimentation, to which the following assessment bears testimony.

10.5 NEO-PLASTIC ARCHITECTURE

10.5.1 Formal Modulation via Vantongerloo

The earliest volumetric transformation of neo-plastic painting can be traced to the sculptures of Vantongerloo – the first sculptor (and one of the only two) of the Stijl movement.

As tempting as it may be to assume that Vantongerloo's sculptures were an immediate response to Mondrian's elemental compositions, his plastic repertoire was in fact the result of an arduous process of creative inquiry. Just as the other pioneering modern sculptors, Vantongerloo, too, subjected the naturalistic starting point to a series of reductive stages (*figs 10. 34*). Yet, he soon enough arrived at three-dimensional compositions – so-called volume constructions – which displayed the same formal and tactile characteristics as neo-plastic paintings. The latent tectonic potential is obvious, but as Martienssen (1941: 245) rightfully observes:

> "The space and volume constructions of Vantongerloo, made as early as 1918, through architectural in intention, were little more than laboratory experiments pointing the way to a new synthesis of structural forms. Their significance was directional, but whether they were capable of extension and interpretation into the full scale of architectural construction is doubtful."

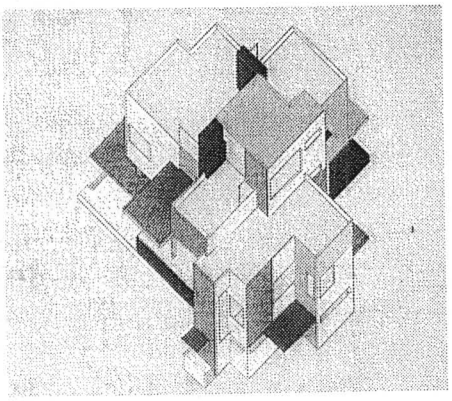
Although unintended, Vantongerloo's volume constructions and the earliest projects of the architectural contingent of De Stijl – Van't Hoff's Villa Henny, Wils's De Dubbele Sleutel and Oud's Purmerend Factory – bear a remarkable similarity, recalling also Wright's childhood preoccupation with his Froebel blocks. All these projects display a similar formal modulation, comprising an assembly of interlocking cubic and rectilinear volumes (*figs 10.35-10.37*). Vantongerloo's sculptural treatment of form also coincided with Wright's design methodology, which Oud enthused about since it "opened new ethical possibilities for architecture on [a] purely constructive basis" (Doig, 1986: 46). [17] Oud was particularly taken with Wright's internalized approach to design, and from which the American architect derived the massing and spatial organization of his buildings as an unadulterated expression of function.

If the embryonic architectural manifestations of De Stijl were modelled after the Wrightian precedent, there can be little doubt that Van Doesburg's and Van Eesteren's projects prepared for the De Stijl exhibition were far more deliberated responses to Vantongerloo's sculptures, which may even apply to Oud's Project Manager's House. According to Doig (*ibid.*: 58), Van Doesburg made the following insightful remark with respect to an article by Oud on the work of Wright "where the interpenetration and origin of the play of masses, etc. come under discussion. It can be added, and mark this well, that these ideas in architecture are secondary [*sic*] in the sense that they have been borrowed from the art of painting." [18] Martienssen (1941: 245) concurs:

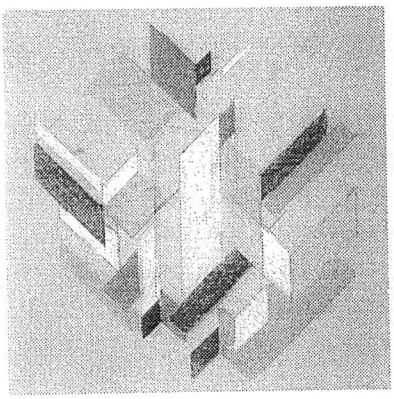
---

17 From Oud, J. J. P., 1918, "Architectonische Beschouwing bij Bijlage VIII", *De Stijl*, vol. 1, no. 4.

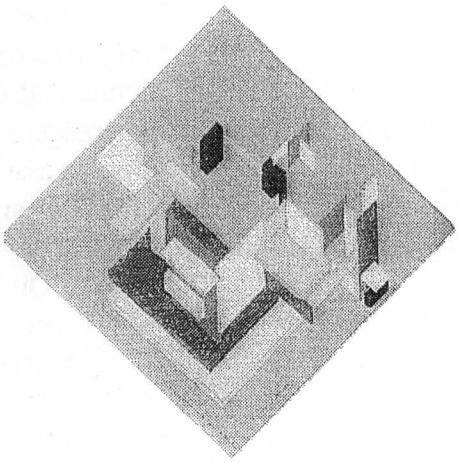
18 From Van Doesburg, T., "Editorial Comment", *De Stijl*, Sept. 1918, vol. 1, no. 2, in which the mentioned, though unspecified, article by Oud appeared.



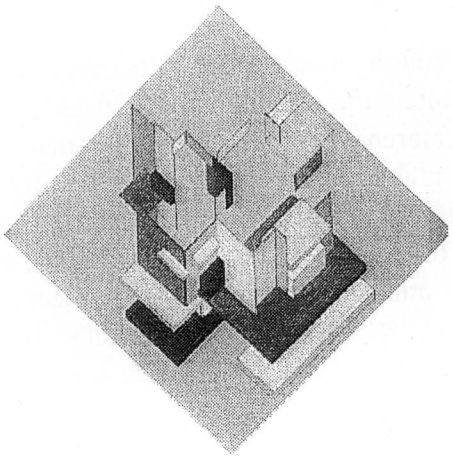
10.38 Van Doesburg & Van Eesteren, axonometric of Maison Particulière (1923).



10.39 Van Doesburg, *Counter-Construction*, Maison Artiste (1923).



10.40 Van Doesburg, *Counter-Construction in the 4th Dimention of Time and Space* (1924).



10.41 Van Doesburg, *Counter-Construction* (192

"At any rate a too literal adherence to the (now apparently) inorganic piling up of volumes in Vantongerloo's space constructions led to the self-conscious and architecturally disrupted projects for houses by Van Doesburg and his collaborators in 1922. The initial statement of volume, however, had been achieved and even if the true synthesis of structure and volume organisation was yet to be considered, the step taken was important ... The crystalline continuity of form and the essentially external nature of deliberate groups of attached volumes are characteristic of the Vantongerloo-Doesburg experiments. In this sense the arrangements are 'abstract' and concerned with surfaces in a context completely removed from the practical and structural limitations of space creation."

10.5.2 Volumetric Transformation via Van Doesburg and Van Eesteren

The first of Van Doesburg's and Van Eesteren's hypothetical projects, Maison Rosenberg (Hotel Particulier, [19] *fig. 10.30*) – designed for the Parisian gallery owner in accordance with his requirements and accommodating an ambitious brief [20] – consisted of a conglomerate of interlocking cubes that varied in size according to their respective functions. Arguably, this design method was an extension of the Wrightian approach adopted long before by Van't Hoff, Wils and Oud. On the other hand, these studies in additive form recalled Vantongerloo's Volume Constructions as much as Malevich's Arkhitectons. The rigidity of the cubic massing was selectively intercepted by cantilevered concrete planes to provide cover or serve as terraces. All traces of symmetry and ornament had been disposed of, and the use of colour was a totally integral part of the scheme. Considerable attention was also paid to the composing of the façades and placing of apertures. The structure was based on Le Corbusier's Dom-ino model (though confined to the periphery of the different cellular volumes), which permitted the generous use of strip windows, and protrusions to be treated as floating planes.

Maison Particulière (*figs 10.31*), a compact refinement of the previous project, displayed a greater degree of contrast between the horizontal and vertical, solid and void, and emanated a more balanced distribution of volume and plane. Of the three projects, Maison d'Artiste (*fig. 10.32*) – designed according to a hypothetical brief and comprising a dwelling and studio for an artist – was the most successful and harboured most plastic potential. Unlike the surprisingly axial organization with a north-south orientation of Maison Rosenberg, the planning of Maison d'Artiste was organized around a centrally located circulation core. Its rotated massing displayed a volumetric modulation that seemed to have been determined less by programmatic requirements than the compositional ensemble.

10. 5.3 Four-Dimensional Decomposition

These three projects were noted not so much for their architectural merit, but for Van Doesburg's accompanying axonometric drawings, aptly entitled *Counter-Constructions (in the Fourth Dimension of Time and Space, figs 10.38-10.41)*. In a review on the exhibition, published in *L'Esprit Nouveau* in 1923, Le Corbusier criticized the dissolution of pure geometry, maintaining that it would result in "a stuttering and simplistic vocabulary of form", but he commented favourably on the manner of

---

19 Doig (1986: 154-156) describes the house designed for Rosenberg as "Hotel Particulier", which consisted of a combination of three dwellings – one for the owner, one for the staff and another for the chauffeur. Warnecke (1991: 162) refers to the project as "Maison Rosenberg" and maintains that Maison Particulière was structured according to a hypothetical brief. Doig, however, creates the impression that the latter project was a refinement of one of Rosenberg's collection of dwellings, and presumably his own.

20 See Doig (1986: 153-154) for Rosenberg's detailed brief to Van Doesburg in a letter dated 3 Jan. 1922.

presentation (Warnecke, 1991: 169). [21]

These renderings – reminiscent of Lissitzky's Prouns – were in all probability made after the completion of the first two projects, but must have played a significant role in the more integrated design resolution of Maison d'Artiste. Doig (1986: 158) concurs:

> "The axonometric and counter-construction for the Maison d'Artiste show how the experiment with the Maison Particulière, where the colour planes and architectural planes were unsatisfactorily resolved in terms of panels, had influenced the architectural elements themselves in the Maison d'Artiste, the third model."

However, from a conceptual point of view, the realized projects are irrelevant as the drawings surpass their physical manifestation in built form. According to Doig (*ibid.* 148), Van Doesburg had long since expressed his frustration at the difficulty to convey his colour-coded intentions with traditional drawing conventions. Not only did the axonometric enable him to do so, but it elevated the content to the realms of the space-time paradigm. These renderings – or counter-constructions – firstly, gave fruition to Van Doesburg's assertion that "the four walls" (and later the floor and ceiling) should be viewed as "one plane". Secondly, it brought to fulfilment his conceptual treatment and understanding of space: one has to rotate – thus, move through space and in time – from surface to surface (from plane to plane) in order to assimilate the disassembled content of the "painting" (equated with the architecture), which is then reconstructed in the mind's eye. The painting becomes the architecture, and the architecture the painting – whether viewed from inside or outside, or even simultaneously. Van Doesburg confirmed that "The track of man in space (from left to right, from front to back, from above to below) has become of fundamental importance for painting in architecture" (Frampton, 1969; 1991: 154). [22]

Thus, on the one hand, Van Doesburg had fulfilled Mondrian's prophecy, on the authority of Chipp (1986: 315), that "In the future, tangible embodiment of pictorial values will supplant art. Then we shall no longer need paintings, for we shall live in the midst of realized art." On the other hand, Van Doesburg had illustrated – in architectural terms – the process, the spatial and the kinetic content of Analytical and Synthetic Cubism, as conversantly introduced by Picasso via *Les Demoiselles d'Avignon*. Most importantly, this had been achieved – as Van Doesburg had always maintained possible – through the use of colour. [23] In the words of Doig (1986: 156-157):

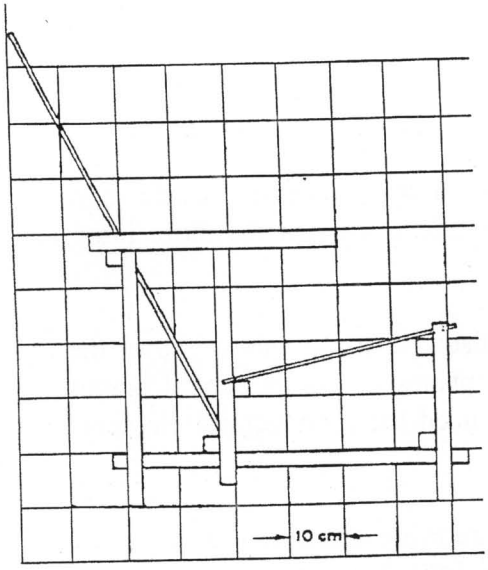
> "Van Doesburg's contribution to the Maison Particulière project took the form of counter-constructive analyses of the house in terms of the inter-relationships of the constituent planes. The study of this sculptural aspect in axonometric projections was repeated in colour all around the house ... The work could not be experienced in its entirety all at once, so the space of the painting, of the architecture, became a conceptual space."

---

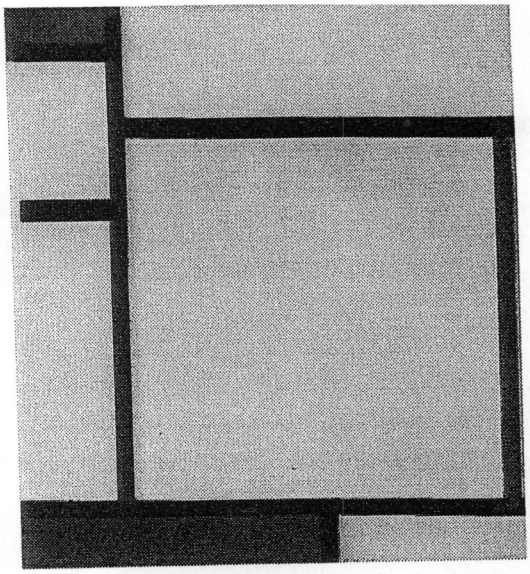
21 From an unspecified article by Le Corbusier in 1923 from *L' Esprit Nouveau* [n. no.]. Warnecke (1991: 169) maintains that it was as a result of this exhibition that Le Corbusier made substantial changes to Maisons La Roche-Jeanneret, which he was busy designing at the time, and which also signalled his first experimentation with colour.

22 Unsourced quotation, but uttered by Van Doesburg with respect to Café Bal Aubette when his colour hypothesis had been extended to all the surfaces, including the floor and ceiling, concurring also with Lissitzky's *Proun-Raum*.

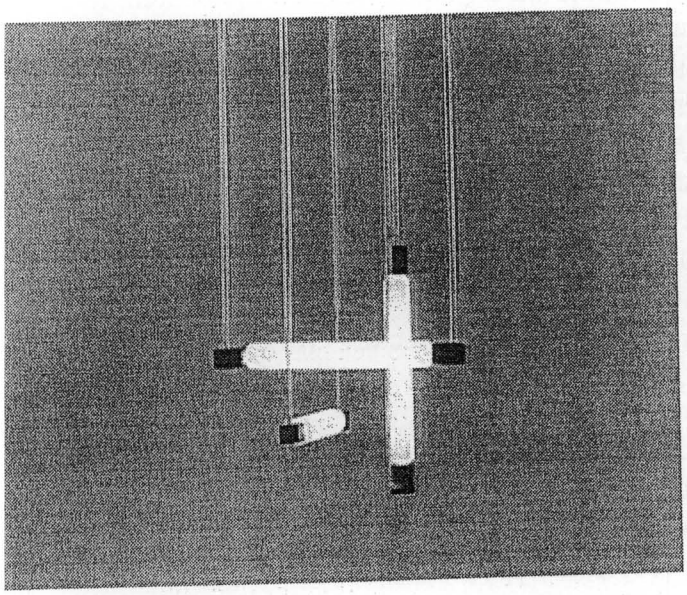
23 Doig (1986: 149) asserts that "In 1922 Mondrian had written pessimistically [to Van Doesburg?] about the possibility of creating a Neo-plastic architecture through the use of colour". Not only did Van Doesburg prove him wrong, but in an early letter addressed to Oud, dated 24 March 1919, cited from Doig (*ibid.*: 25), Van Doesburg made the following interesting, though derogatory, remarks about Mondrian: "Mondrian is actually a dogmatist, and in terms of dogma (with due respect!) he doesn't know what to do with the fourth dimension ... He did maintain that I was much more advance in my work and theory, but he maintained that the Plane [*sic*] was the single and absolute consequence of all creativity. He is [also] indifferent to many subjects such as architecture, communism, etc."



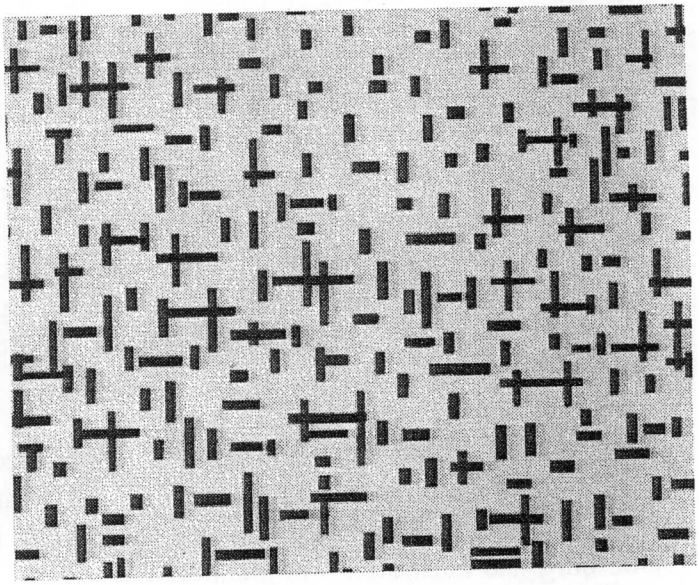
10.42 Rietveld, *Red-Blue Chair* (1917/8).



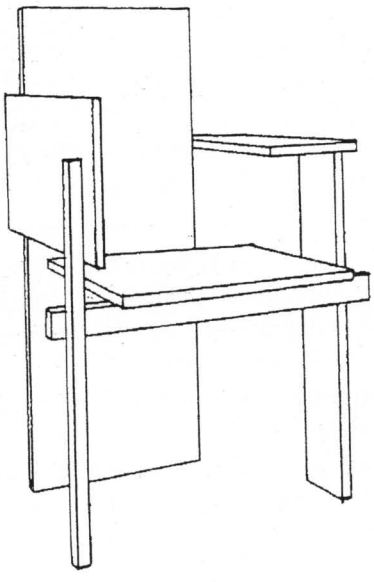
10.43 Mondrian, *Composition* (1922).



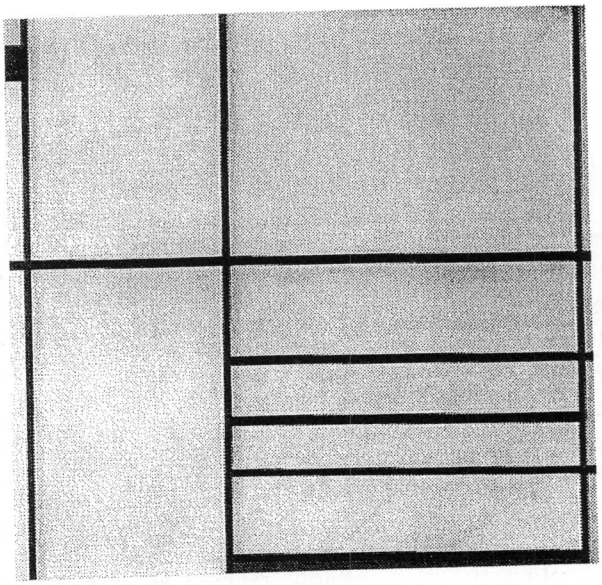
10.44 Rietveld, *Hanging Lamp* (1922).



10.45 Mondrian, *Composition with Lines* (1917).



10.46 Rietveld, *Berlin Chair* (1923).



10.47 Mondrian, *Composition with Red and Black* (1936).

These colour-coded, planar explosions of hermetic form that simultaneously exposes the interior and the exterior – the supposedly four-dimensional decompositions according to Zevi (1978: 31) – were undoubtably Van Doesburg's most significant contribution made to modern architecture. They also met Wright's famous postulate regarding the liberation of enclosed space. It is worth noting that by comparison to Le Corbusier's somewhat unself-conscious responses to space, Van Doesburg's endeavours were far more contemplative. An extract from the fifth De Stijl Manifesto [24] provides a succinct description of these intense theoretical deliberations:

> "ii. We have examined the laws of space and their endless variations (i.e. spatial contrasts, spatial dissonances, spatial supplementations) and have established that all these variations can be welded together into a balanced unity.
> iii. We have examined the laws of colour in space and time and have established that the mutual harmonization of these elements produce a new and positive unity.
> iv. We have examined the mutual interrelationships between dimension, proportion, space, time and material and have discovered a final method of constructing a unity among them.
> v. By breaking up enclosing elements (walls, etc.) we have eliminated the duality of interior and exterior."

In a cumbersome manner, Van Doesburg had arrived at an authentic design methodology of tremendous formal and spatial potential. Regrettably, and perhaps because of his lack of official training as an architect, Van Doesburg never quite internalized, nor fulfilled, the possibilities offered by his own plastic discoveries – as did Rietveld Mies and the New York Five (although in their instance some 40 years later). Nevertheless, Van Doesburg's decompositions exceeded the efforts of any of the earlier proponents of De Stijl, but, more importantly, they contributed to the realization of Rietveld's Schröder-Schäder House.

10.5.4 Rietveld's Spatial Constructs

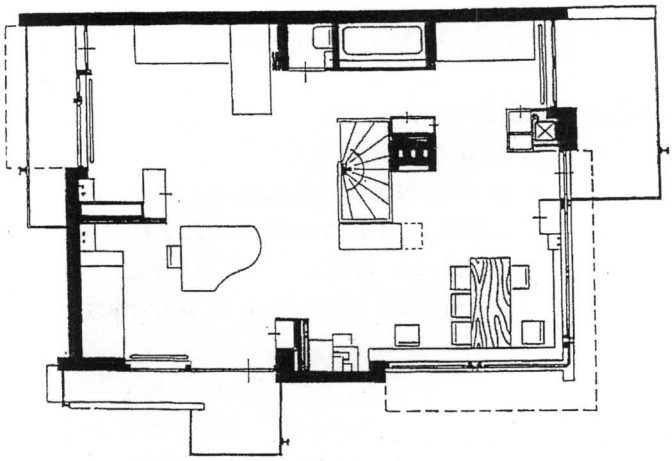
If Van Doesburg's and Van Eesteren's volumetric investigations, via Vantongerloo's formal modulations, provided one entrée into the genesis of neo-plastic architecture, then Rietveld's pieces of furniture presented another. Due to their structural and spatial ingenuity, they transcend their mundane utilitarian purpose to qualify instead as 'spatial constructs' – significantly, the exact opposite of the Soviets' spatial constructions that were in fact anticipating functional application.

Irrespective of its controversial origins, the *Red-Blue Chair* encapsulated both the compositional and spatial aspects of Mondrian's painterly endeavours (*figs 10.42-10.43*). On the one hand, the side-views of the chair resembled elemental compositions of line and colour, though translated as plane and surface. On the other hand, and even more remarkably, Rietveld's overlapping means of construction concurred with Mondrian's planimetric preoccupation to create spatial illusions that extended into infinity. Banham (1960a; 1996: 191) agrees:

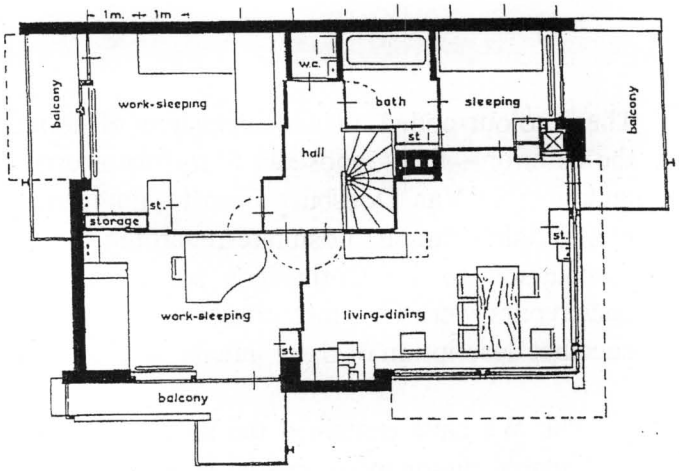
> "Mondriaan's [*sic*] view of space (as expressed in his essay 'Le Nèoplasticisme') of the rectangle as a form '... where line cross or touch tangentially, but do not cease to continue' [*sic*] is given visible substance by Rietveld's chair, where the lines, embodied as the rails of the structure, do indeed form rectangles by touching tangentially, and continuing an arbitrary distance beyond the point of interception."

---

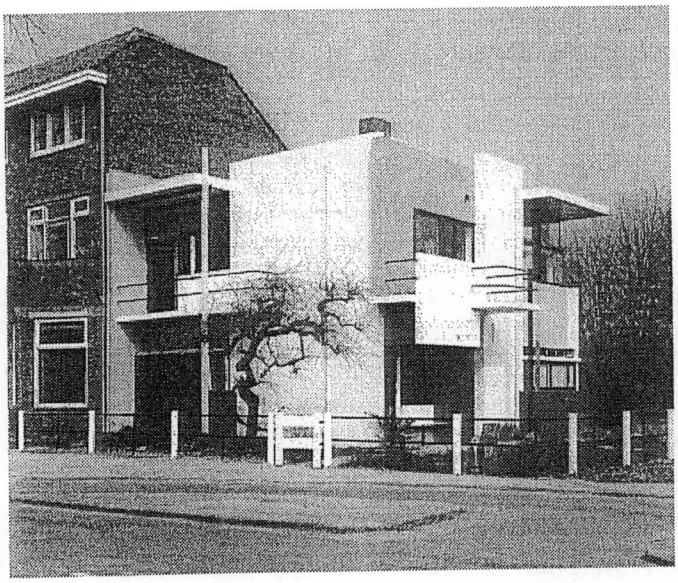
24 Van Doesburg, Van Eesteren and Rietveld, 1923, "'De Stijl': Manifesto V: - □ + = R4 – Towards Collective Building [Construction]", De Stijl [n. no.]; Conrads (ed.), 1970 ed.: 66.



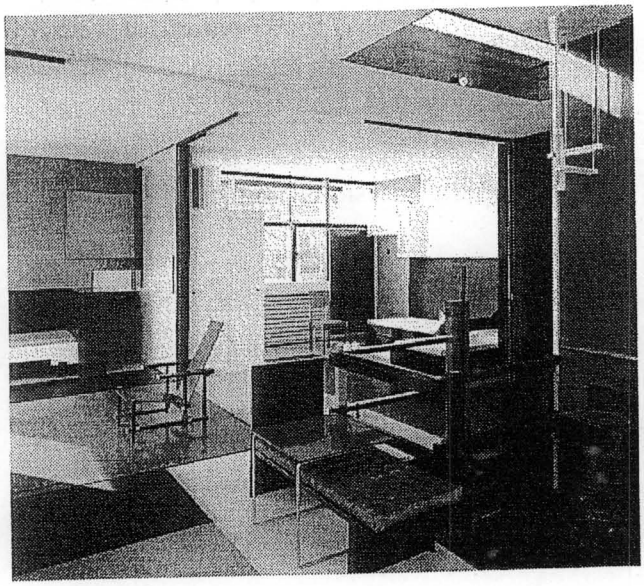
First floor plan without partitions



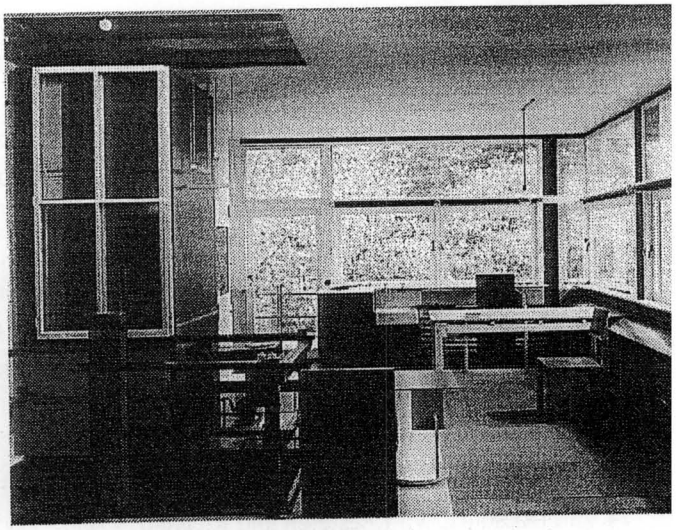
First floor plan with partitions



House in context



Interior, first floor



Interior, first floor

10.48 Rietveld, Schröder-Schräder House, Utrecht (1924).

Rietveld's *Hanging Lamp* was an even more profound demonstration of this pictorial sensation, since its physical mobility imbued this object with yet another dimension that could also be equated with the space-time hypothesis of the Cubists (*figs 10.44-10.45*).

Although static, the *Berlin Chair* displayed similar qualities. This asymmetrical chair consisted of a couple of vertical and horizontal planes, delicately intercepted by linear supports. Each of side views resembled carefully composed elemental compositions, giving new plastic meaning to the pictorial concepts of weight and balance (*figs 10.46-10.47*). The compositional ensemble was an extraordinary three-dimensional exercise in the hierarchical distribution of colour, line, structure and plane, which simultaneously defined, and extended into, space – the definitive utilitarian example of a dynamic equilibrium. The *Berlin Chair,* in addition to Rietveld's other pieces of furniture, suggested an autonomous plastic language that precipitated its architectural embodiment in the apogee of De Stijl, the Schröder-Schräder House.

10.5.5 Neo-Plastic Synthesis: Schröder-Schräder House

In reviewing Rietveld's Schröder-Schräder House (*fig. 10.48*), it is worth considering the prophetic musings by Van Doesburg, published five years earlier in 1919:

> "Art that has a certain unity, absorbs [into a balanced] relationship all other qualities as its means. In good painting, for instance, the higher unity absorbs the idea, the technical means (in the widest possible sense, including the scientific, manual skills, etc.), and the material. Well then, is it then not possible that architecture can master the use of all its means of construction, walls, floors, beams, roofs, gutters, stairs, doors, windows, columns, porches, balconies, etc., as a plastic means in order to realise the artistic developmental stage in an inseparable unity? That must be possible." (Doig, 1986: 55). [25]

It would be farfetched to suggest that Rietveld's *magnum opus* was a deliberated response to these apocalyptic words, [26] yet, this double-storey house of modest accommodation encompassed all that neo-plastic painting aimed at. Although prismatic, it was dematerialized in such a way that the geometry was dissolved into a series of floating horizontal and vertical planes. The emblematic De Stijl coloured surfaces, combined with the delicate linear interventions caused by columns, beams, rainwater down pipes and hand rails, epitomized the architectonic equivalent of Neo-Plasticism. From studying the modular footprint, it is immediately apparent that Rietveld must have given considerable attention to composition as each indentment or protrusion on plan had a distinct three-dimensional implication, and vice versa. This was further accentuated by the manner in which the architect chose to support the concrete balconies, which was not only similar to the overlapping method of jointing explored in his furniture, but it also structured the overall composition. Much attention has been called to the fact that the structure was not skeletal and consisted, instead, of load-bearing brick walls, with the use of concrete restricted to the protruding balconies. However, this amalgamated method of construction permitted Rietveld to exploit every opportunity of support and connection.

---

25 From Van Doesburg, T., Sept. 1919, " Slotbemerkingen", *De Stijl*, vol. 2, no. 11.

26 It is noteworthy that although Rietveld had worked closely with Van Doesburg on the retrospective De Stijl exhibition (he assisted with the model for Maison Rosenberg) and was also one of the three signatories of the fifth manifesto, the Schröder-Schäder House was a completely independent undertaking. This becomes obvious from Van Doesburg's correspondence to Domela, dated 27 Aug. 1925, in which he wrote, as cited from Doig (1986: 168-169): "As if I hadn't inspired the fruition of the whole of the New architecture in Holland; nobody lets that bother them, and architects (of such character) will certainly keep that to themselves with an easy conscience! Still, I was pleased to see an excellent house (in the photo) by Rietveld, whom I consider amongst the most honest and talented architects along with Van Eesteren."

The flexible first-floor plan, designed in collaboration with Truus Schröder-Schräder (1889-1985), enabled multiple uses, with only the bathroom, stairs and certain fixtures in static positions. The interior displayed the same consistent attention to detail and colour application, sporting also Rietveld's renowned pieces of furniture and light fittings. The house, considered the most revolutionary of its time, was a homage to Wright's call for a totally integrated, designed environment.

With the exception of its non-skeletal means of construction, the house met the criteria of Van Doesburg's 16 points "Towards a Plastic Architecture" (1924; 1970.: 78-80). [27] It was elemental, economic, functional, supposedly form-less (rather style-less), anti-monumental (in terms of size, but monumental "on the basis of interrelationships"), open-plan, anti-cubic, asymmetrical, non-repetitive, anti-decorative, and so forth. According to Van Doesburg (*ibid.*: 79), the design also took cognizance of the notions of time and space, which he qualified as follows:

> "10. Space and time. The new architecture takes into account not only of space but also of the magnitude time. Through the unity of space and time the architectural exterior will acquire a new and completely plastic aspect. (Four-dimensional space-time aspects.)" [Emphasis as quoted.]

Van Doesburg's 11th point (*ibid.*) is a poignant summary of Rietveld's accomplishments:

> "11. The new architecture is anti-cubic; that is to say, it does not attempt to fit all the functional space cells together into a closed cube, but projects functional space-cells (as well as overhanging surfaces, balconies, etc.) centrifugally from the centre of the cube outwards. Thus, height, breadth, and depth plus time gain an entirely new plastic expression. In this way architecture acquires a more or less floating aspect (in so far as this is possible from the constructional standpoint – this is a problem for the engineer!) which operates, as it were, in opposition to natural gravity." [Emphasis as quoted.]

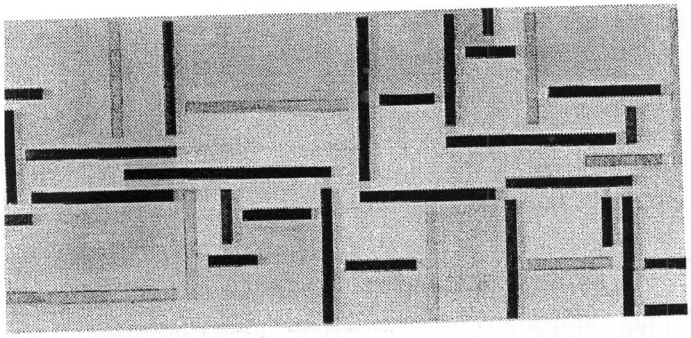
Yet, if the house did not convey the spatial drama of the *en route* experiences of Le Corbusier's villas, it concretized Van Doesburg's conceptual spatial premise with regard to the reconstituted painterly assemblage through space and in time. This cognitive (versus a physical) spatial experience, coupled with the house's asymmetrical organization, geometric dematerialization, dynamic equilibrium, simultaneous spatial definitions and extensions, and aspectival interiors and exteriors, serve as a profound testimony to the plastic innovations afforded by modern art. Banham (1962; 1975: 68) provides the following assessment of the Schröder-Schräder House:

> "A Cardboard Mondriaan [*sic*] ... tiny, structurally timed, badly sited and undistinguished in plan ... for the first time, in 1924, the aesthetic possibilities of the hard school of modern architecture was brilliantly revealed ... There may be a long-range debt to Wright, but the implications of Wright's domestic space-games have been purged and made clean through the aesthetic detergency of European abstract art. The surfaces are, indeed, as smooth and as neutral as those of a Mondriaan painting, in similar colours, relieved only by the muse of glass that emphases its immaterial quality ..."

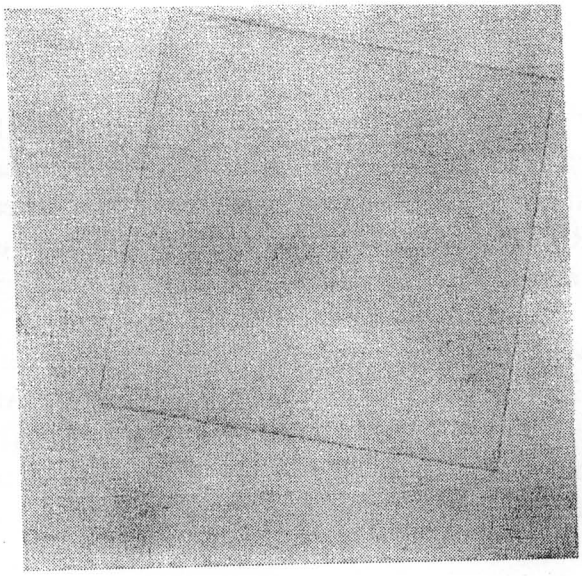
With the Schröder-Schräder House, neo-plastic architecture had come into its own, which Frampton (1968; 1991: 150) describes as follows:

---

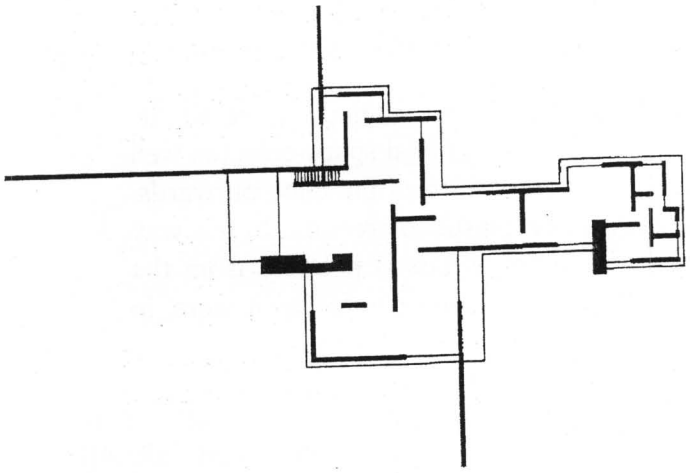
27 Van Doesburg, T., 1924, "Towards a Plastic Architecture", *De Stijl*, vol. 12, no. 6/7; Conrads (ed.), 1970 ed.: 78-80.



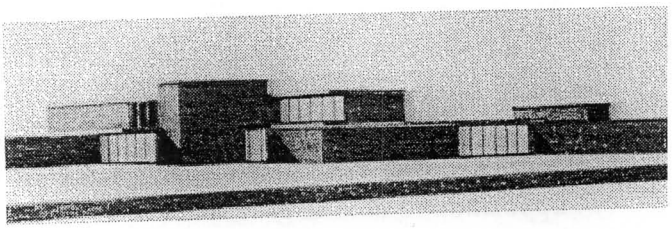
10.49 Van Doesburg, *Rhythm of a Russian Dance* (1918).



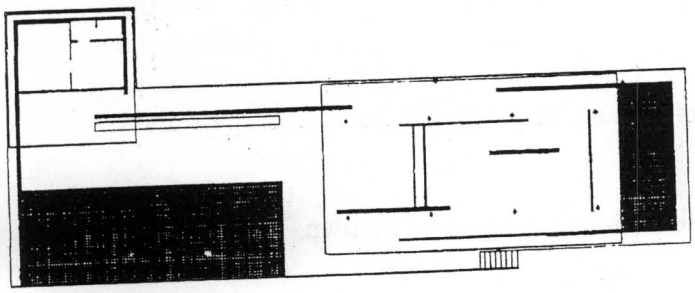
10.50 Malevich, *Suprematist Composition: White on White* (1917/8).



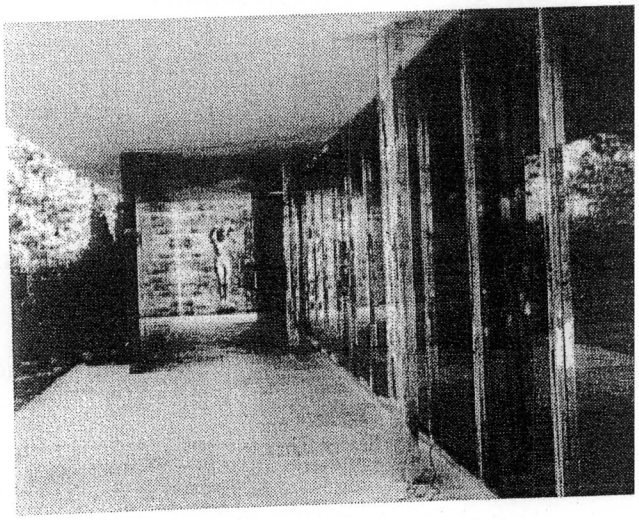
10.51 Mies, plan, Brick Country House, project (1922/23).



10.52 Mies, Brick Country House, project (1922/23).



10.53 Mies, plan, German Pavilion [Barcelona Pavilion], World Exhibition, Barcelona (1929).



10.54 Mies, German Pavilion [Barcelona Pavilic World Exhibition, Barcelona (1929).

> "A dynamic asymmetrical arrangement of articulated elements throughout; the spatial explosion of all internal corners as far as possible; the use of low relief colour rectangular areas to structure and modulate internal spaces; and of course finally the adoption of primary colour for the purposes of affecting accentuation, articulation, recession, etc."

10.5.6 Neo-Plastic Successor: Mies van der Rohe

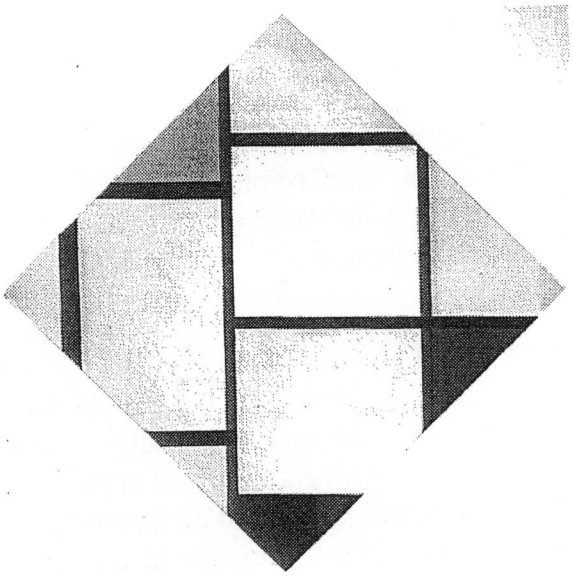
Considering that Mies was the only non-De Stijl participant of "Les Architects du Groupe de Stijl Exhibition" – however much restrained by Van Doesburg's temperamental personality – his contribution to Heroic Modernism warrants scrutiny, in particular, since Mies's domestic repertoire owes much neo-plastic painting. Moreover, if Rietveld's Schröder-Schräder House can be faulted for a relatively limited spatial voyage (in physical, rather than visual terms), Mies's projects, by contrast, exude a spatial animation that can be traced directly to his interpretation of the artistic precedent.

Martienssen (1941: 253) is of the opinion that Mies was able to establish a far more pragmatically viable interface between neo-plastic painting and architecture than any of the Stijl proponents. He contributes this to the fact that the hermetic, or "closed patterned", elemental compositions of Mondrian were developed volumetrically, instead of the more open-ended paintings of Van Doesburg. Although Martienssen (*ibid.*) erroneously maintain that Mondrian's paintings are "untranslatable into architectural terms" (Rietveld's spatial constructs prove the opposite), those by Van Doesburg, "in its formal arrangement states clearly a generalised and widely variable architectonic scheme". Martienssen (*ibid.*: 253-254) continues:

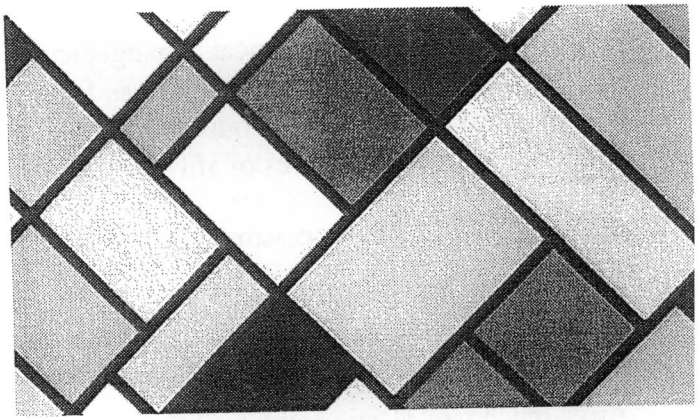
> "There can be little doubt that the *Russian Dance* painted as a symbolic arrangement by van Doesburg in 1918, bore a relation to the work of Mies van der Rohe (in its plane pattern) similar to that subsisting between the Dutch volume constructions and the architectural work of Rietveld. But the influence, though two-dimensional as compared to the three-dimensional inspiration of Vontongerloo's models, had from an organisational point of view more direct possibilities of application.

The compositional organization of the Brick Country House (1922/3) and the *Rhythm of a Russian Dance* (1918) is virtually identical (*figs 10.49, 10.51*). From an artistic point of view, Mies's hierarchial treatment of line evidenced by the footprint of his building emanates an even greater sense of dynamicism than Van Doesburg's painterly composition. Martienssen rightfully observed that, in architectural terms, the open-ended nature of Van Doesburg's painting permitted a programmatic and spatial adaptation of considerable ease. However, if the three-dimensional extrapolation of the house is disappointing, even clumsy (*fig. 10.52*), then Mies's German (Barcelona) Pavilion (1929, *figs 10.53-10.54*) addressed this deficiency, far exceeding its planimetric merits. Not only did Mies concretize the latent spatial potential of the *Russian Dance*, but he also realized Van Doesburg's counter-constructions. This synthesis can be attributed to the fact that Mies – like Le Corbusier – had induced a predetermined structural framework on his 'architectural canvas' that enabled the uninhibited distribution of non-loadbearing planar elements, which he explored to their fullest plastic potential. Martienssen (*ibid.*: 250, 253) concurs:

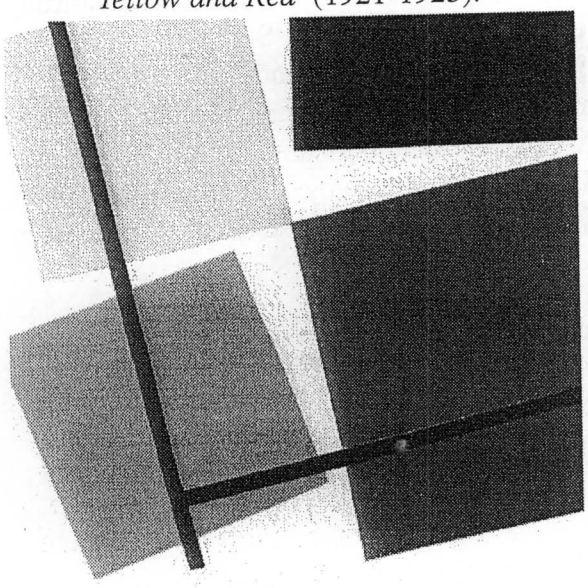
> "Superficially the Dutch volume constructions appear more closely akin to recognisable architectural idiom because of the individual completeness and tangible unity of the related volumes, but the lack of an organically extensible structural mechanism stifles the practical development after the initial statement has been made in model form .... [For Mies] these [structural] supports contribute an aesthetic discipline in their regularity, and affirm the nature and continuity of the major volume, while the screens differentiate without producing discontinuity."



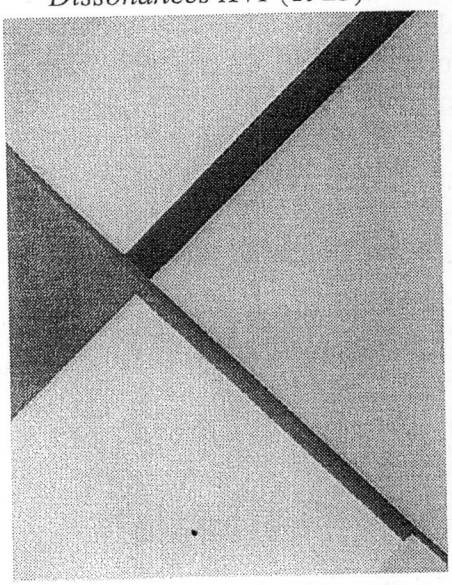
10.55 Mondrian, *Lozenge with Blue, Yellow and Red* (1921-1925).



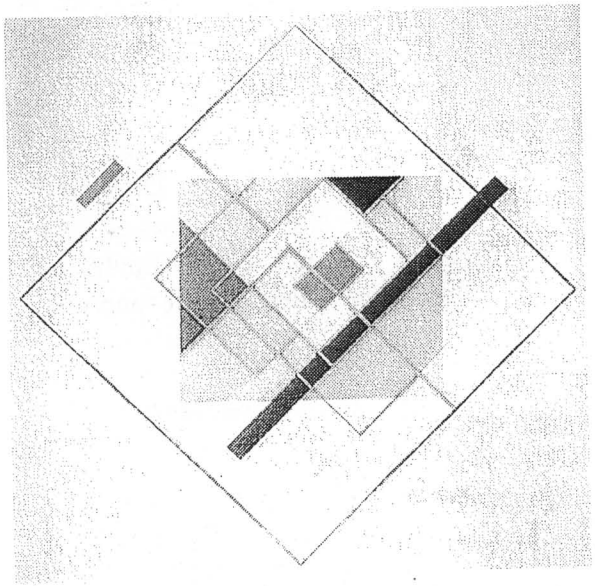
10.56 Van Doesburg, *Counter-Composition of Dissonances XVI* (1925).



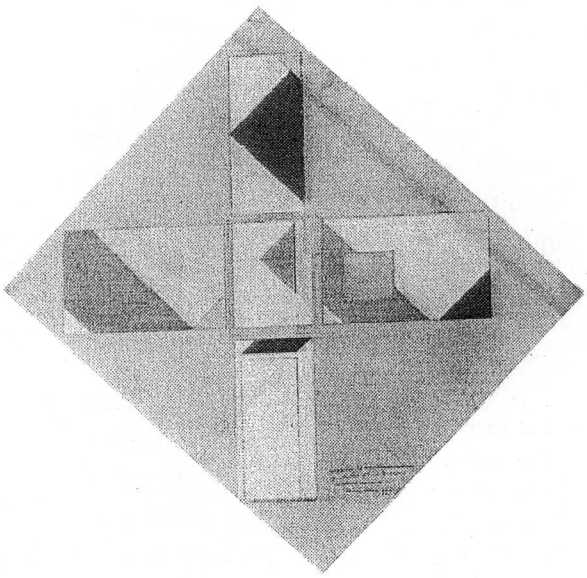
10.57 Elementarism: Van Doesburg, *Simultaneous Counter Composition* (1929).



10.58 Elementarism: Gildewart, *Composition No. 25* (1927).



10.59 Elementarism: Domela, *Neo-Plastic Composition, No. 20* (1930).



10.60 Elementarism: Van Doesburg, Conservatory, Villa Noailles, Hyéres (1925).

If the Schröder-Schräder House epitomized the universal aesthetic canons of Neo-Plasticism, then the Barcelona Pavilion can be considered the incarnate of elemental painting – the ultimate architectural statement of line, form, colour (texture) and space, achieved with the simplest of means. This project is so finite in its tectonic realization that it spontaneously recalls the apogee of abstract art – Malevich's *Suprematist Statement: White on White* (*fig. 10.50*).

10.6 PERIOD OF TRANSFORMATION AND DISINTEGRATION (1925-1931)

10.6.1 Elementarism

There was in effect very little neo-plastic architecture after 1925, with no other project by any of the De Stijl proponents displaying ever again the plastic vitality of the Schröder-Schräder House. From a theoretical point of view, the final phase of De Stijl was dominated by Lissitzky's hold on Van Doesburg, and an ever-increasing preoccupation with functionalist premises to which there was wide assent in the Netherlands from the mid-1920s, inevitably, to the detriment of the universal cosmogony of the neo-plastic aesthetic.

Lissitzky's influence over Van Doesburg manifested even more visibly than before, prompting, foremost, the incorporation the diagonal as part of the sanctioned neo-plastic vocabulary. [28] Van Doesburg was of the opinion that the diagonal was a logical extension of neo-plastic aims, but Mondrian did not agree. At most, Mondrian was prepared to confine his compositions to diacritic, lonzenge-shaped canvases, but the content remained orthogonal (see *fig. 10.55 vs fig. 10.56*). His resultant disassociation from the movement in 1925 marked the beginnings of its disintegration.

In support of his new insights, Van Doesburg, in turn, developed a theory named "Elementarism" ["Elementarist"] [29] – versus the "Elemental" or "Elementary" of the late-1910s – published in the article "Painting and Plastic" in 1926. Elementarism was marked by Van Doesburg's intention to imbue neo-plastic painting – and assumingly neo-plastic architecture – with an additional sense of dynamicism. He rightfully recognized that the mobility resulting from oblique distortions surpasses the carefully considered distribution of linear and colour accents. In Van Doesburg's own words:

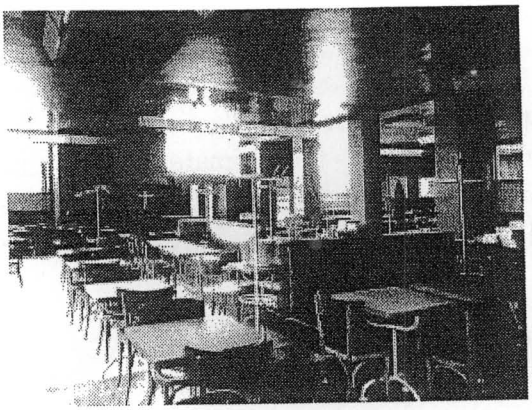
> "The rectangular composition in which extreme tensions, horizontals and verticals had been neutralized was a relic from the classical tradition, and therefore displayed a certain homogeneity with the static state of architecture. The counter-composition (or anti-static composition) has liberated itself from this uniformity. Its diametrically opposed relationship with architecture (though on a different level) can be compared to the contrast between flat, white architecture and grey nature with all its curves. Elementarism has now liberated painting completely from conventions." Warnecke (1991: 81) [30]

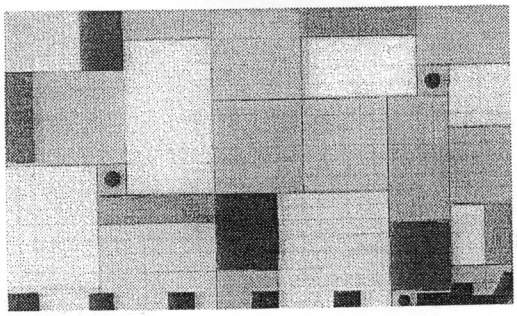
---

28 The use of oblique lines had always been an integral part of the discussion of neo-plastic painting. It is noteworthy that during the formative years of Neo-Plasticism, Mondrian did investigate its use, which Van Doesburg opposed. At that point, Van Doesburg felt that it created the perspectival sense of depth that they were trying so earnestly to avoid. However, after having turned one such a composition through 45 degrees, Mondrian arrived at his diacritic lozenge-shaped canvases, but with the pictorial content remaining horizontal and vertical. He subsequently never deviated from this procedure, hence his quarrel with Van Doesburg. On the authority of Frampton (1968; 199: 158), Mondrian wrote the following to Van Doesburg: "After your high handed improvement (?) of neo-plasticism any cooperation is quite impossible from me ... For the rest *sans rancune*."

29 Van Doesburg's theory is referred to by different names by different authors. Banham (1960a; 1996: 199) even makes a further distinction between Van Doesburg's so-called Elementarist approach and a "structural Elementarism". Intrinsically, all these denotations refer to the importance attached to the rudimentary "elements" of painting and architecture. This author considers the orthogonal examples of Neo-Plasticism as "elemental" or "elementary", and the diagonal – admittedly, the more dynamic version – as exemplary of the "elementarist" approach.

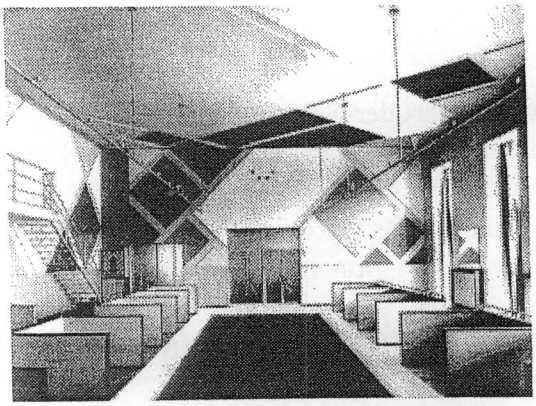
30 From Van Doesburg, T., 1926, "Painting and Plastic", *De Stijl*, vol. 7, nos. 75/76 [*sic*].

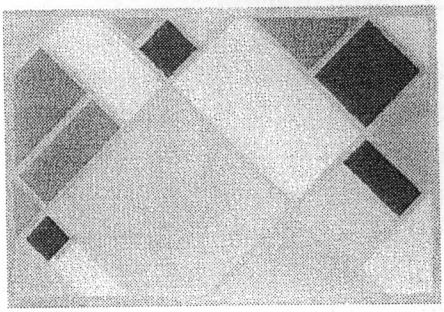




Colour scheme of ceiling

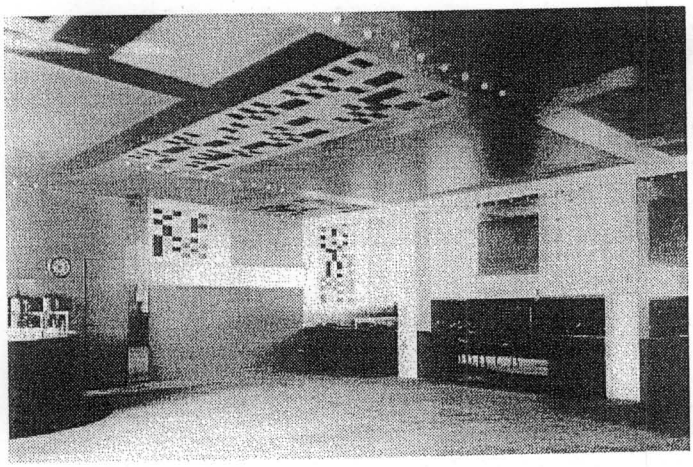
10.61 Van Doesburg, Café Bal Aubette, Strasbourg (1927).



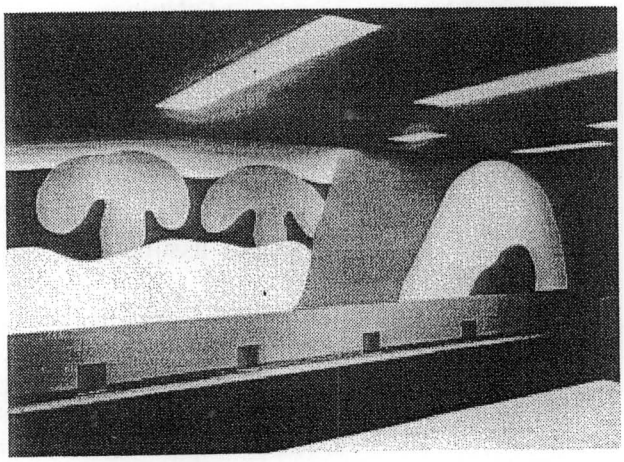


Colour scheme of ceiling

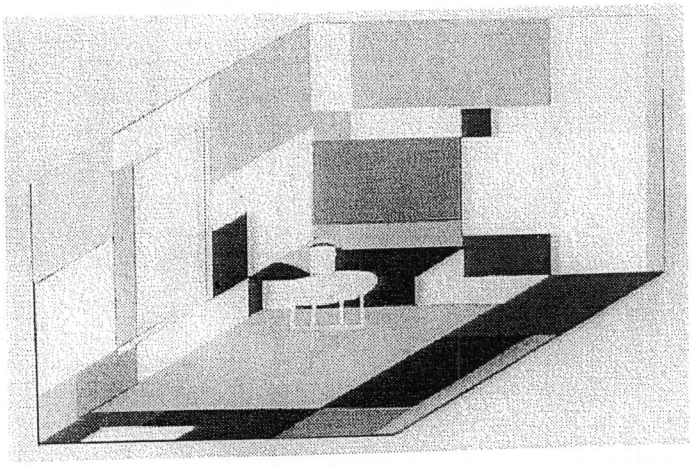
10.62 Van Doesburg, cinema-*cum*-dance hall, Café Bal Aubette, Strasbourg (1927).



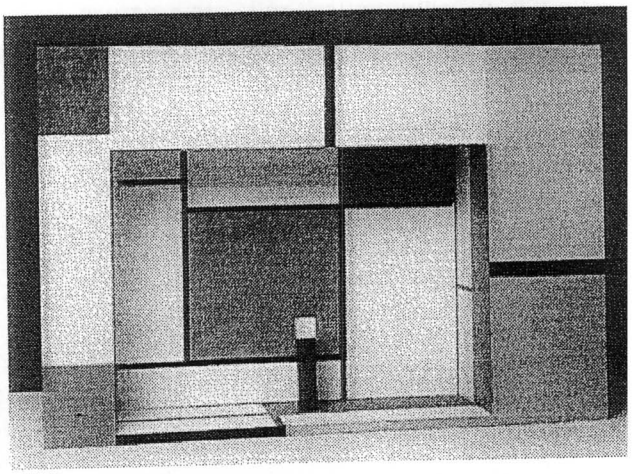
10.63 Tauber-Arp, tea-room, Café Bal Aubette, Strasbourg (1927).



10.64 Arp, basement, Café Bal Aubette, Strasbourg (1927).



10.65 Mondrian, interior remodelling for Ida Dresden (project, 1923).



10.66 Mondrian, stage-set for *L'Ephémère est Éte* (1926).

Banham (1960a; 1996: 199) comments:

> Paradoxically, it was Russia that offered the way of deliverance from the limitations of de Stijl's own aesthetics ... Van Doesburg ... whose new style, which he developed in the middle twenties, was not only called by him Elementarist (though it differed from structural Elementarism) but also depended on a diagonal mode of composition that he clearly derived from Ladowskian aesthetics by way of Lissitzky, and a history in the Russian Movement that goes back to paintings done by Malevitch during the war."

Apart from semantic discrepancies, the theoretical content and practical implementation of Elementarism are contradictory. On the one hand, as mentioned before, Van Doesburg had two years earlier enunciated that painting without an architectural programme has no reason for further existence. Despite this statement, he continued to paint. Ironically, Van Doesburg's paintings displayed a greater degree of artistic merit once he had established his independence from Mondrian, and imbued his artistic repertoire with the desired planimetric mobility (*fig. 10.57*).

On the other hand, the manner in which this additional kinetic sensibility was to be translated into architectural terms is unclear (even whether it was suppose to be). Particularly, since Van Doesburg's treatment of the diagonal never surpassed a tactile implementation and surface treatment, remaining an intrinsically "painterly perception of architecture", in the words of Doig (1986: 58). Thus, Van Doesburg's Elementarism was a completely different approach to the architectonic implementation of oblique geometries by the Soviet architects, such as Lissitzky and Melnikov (presumably the "structural" Elementarism as referred to by Frampton).

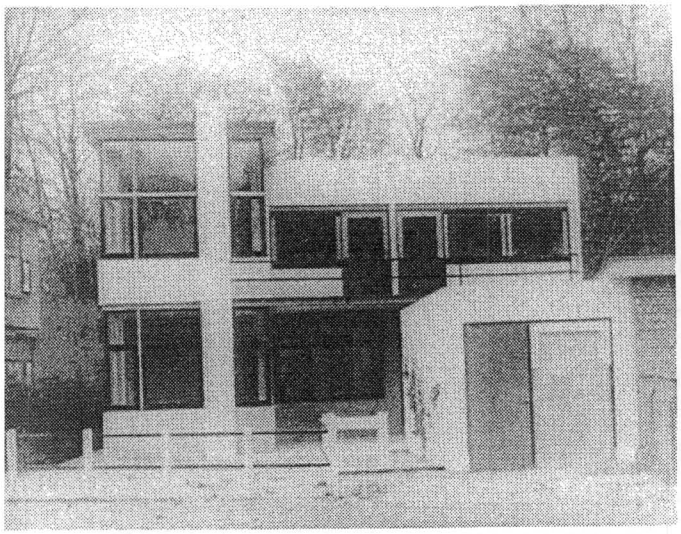
Besides Van Doesburg, Elementarism was also adopted by some of the artists associated peripherally with the De Stijl initiative, including Friedrich Vordemberge-Gildewart (1899-1962, *fig. 10.58*) and Domela (*fig. 10.59*). Yet, as far as it can be established, Elementarism made its presence felt in only two architectural projects. The first entailed a small conservatory designed by French architect Robert Mallet-Stevens as part of Villa Noailles, Hyères, in 1925, where Van Doesburg's input was restricted to the surfaces of a simple rectilinear volume (*fig. 10.60*).

This project was followed by the largest of Van Doesburg's career – the interior remodelling of Café Bal Aubette, Strasbourg, which he designed together with the Dadaist couple Arp from 1926 until 1928 (*figs 10.61-10.64*). Café Bal Aubette, an entertainment complex – comprising a cinema, dance halls and dining facilities – was divided among the three artists who each took charge of his or her portion of the 18th century building. Van Doesburg's contribution vacillated between the static orthogonal approach adopted for certain areas, and the dynamic elementarism applied to the interiors of the major dance-*cum*-cinema hall. In isolation, these designs were the most integrated of Van Doesburg's *œuvre*, even though the fixtures remained in the orthogonal and, in stark contrast with the earlier *Gesamtkunstwerk* ideal, were industrially-manufactured *objets-types*. However, the bizarre mixture of the geometric vocabulary De Stijl with the biomorphic, surrealist designs of Arp elicited a mixed response from the public and resulted in the repainting of the interiors soon after completion. [31]

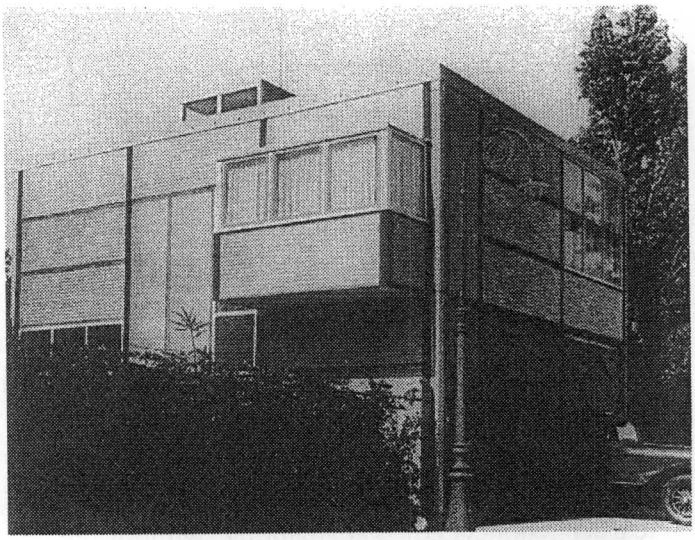
Following this commission, Van Doesburg was involved in two other refurbishments in Strasbourg – a remodelling of an apartment for client Horn, and the interior design of the Magasin de Linoleum for one Meyer. According to Doig (1986: 193), these projects were "by no means as adventuresome as the Aubette", as Van Doesburg had evidently reverted back to orthogonal explorations.

---

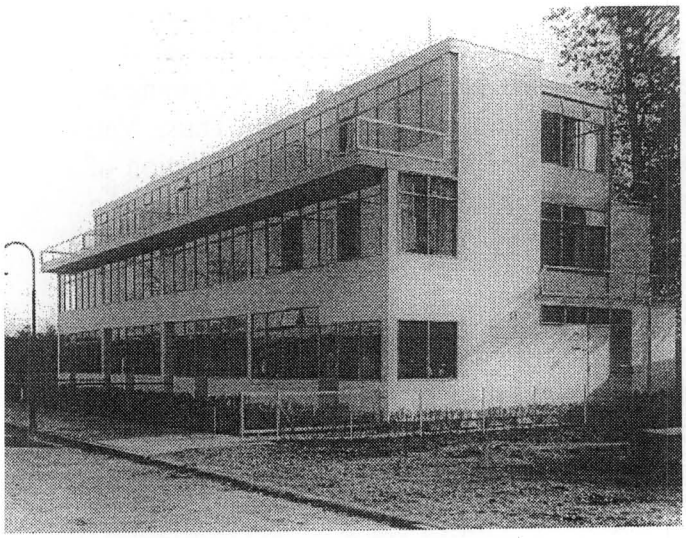
31 The disappointing reception of Café Bal Aubette by the public extracted the following remark from Van Doesburg in a letter addressed to Adolf Behne, dated 16 Feb. 1928: "*das publikum will in dreck leben und soll in dreck verrecken*" (if the public wants to live in shit, they will die in shit), as cited from Doig (1986: 197).



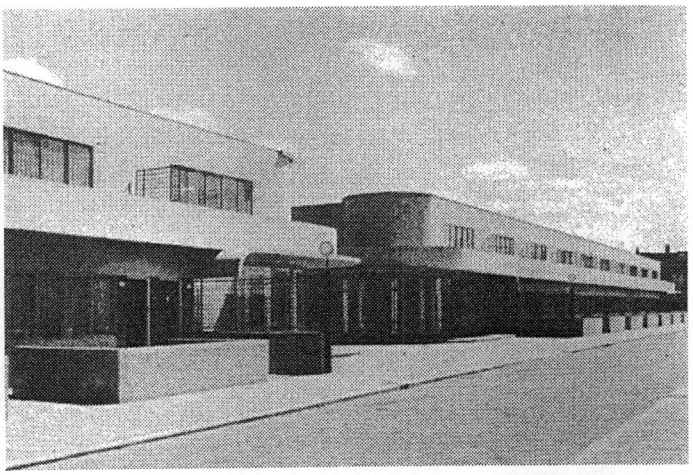
10.67 Rietveld, Lommer House, Wassenaar (1927).



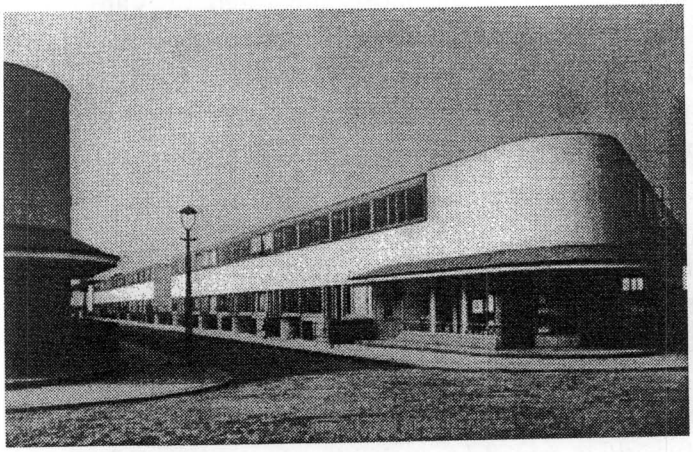
10.68 Rietveld, Garage-*cum*-Chauffeur Flat, Utrecht (1927).



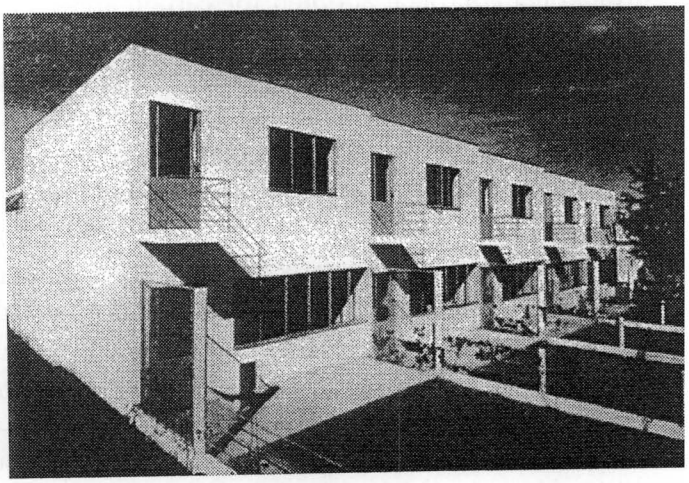
10.69 Rietveld, Erasmuslaan Terraced Houses, Utrecht (1930).



10.70 Oud, Workers' Houses, Hoek van Holland (1927).



10.71 Oud, Row Houses, Weissenhofsiedlung, Stuttgart (1927).



10.72 Oud, Kiefhoek Housing Estate, Rotterdam (1930).

It is noteworthy that after distancing himself from De Stijl, Mondrian suddenly tried his hand at architecture. He designed the interior of his own studio in Paris and made a similar proposal for an art collector in Dresden, one Ida Bienert, in 1926, although this never came to fruition (*fig 10.65*). In the same year, he designed a stage set for the play "L'Ephémère est Éternel" by Michel Seuphor, which was executed (*fig. 10.66*). However, Mondrian's own designs, like those by Van Doesburg, never quite extended beyond a painter's approach to architecture. Notwithstanding, these architectural attempts did at least fulfil his conviction that we will be living in the midst of art.

10.6.2 The Demise of De Stijl

Elementarism was not only an expanded aesthetic sensibility, it was also a concerted effort by Van Doesburg to reconcile the idealized aesthetic objectives of De Stijl with a broader social and cultural programme. Frampton (1968; 1991: 151) observes:

> Van Doesburg was prescient enough ... to realize that such a *Gesamtkunstwerk* ideal could result in arbitrary, artificially delimited culture – hermetically sealed off from the 'banal' production of everyday life. Such a culture would in any case eventually become inherently antipathetic to the programmatic De Stijl concerns (subscribed to even by Mondrian) for the unification of art and life."

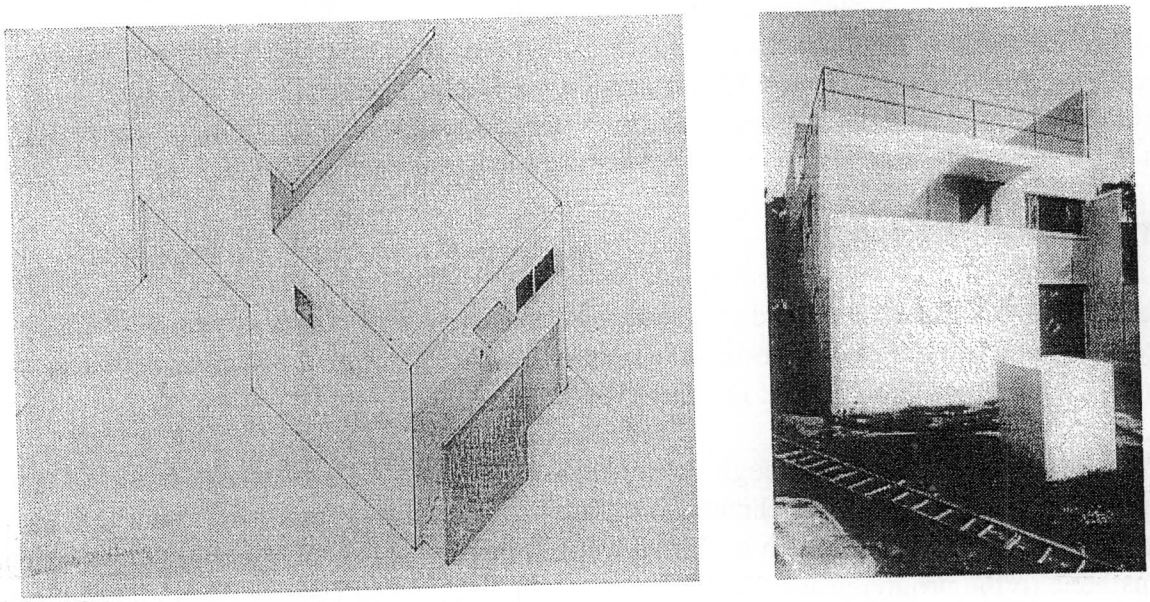
Café Bal Aubette was a noticeable attempt in this regard, with the furniture, fittings and utensils "spontaneously engineered by society at large", but at a macro level "the space containing such objects still required to be modulated and ordered by a conscious aesthetic act" (*ibid.*: 151-152). On the one hand, the assimilation of technology and the machine had always been an integral part of the De Stijl dialogue (Doig, 1986: 37-39), and was merely considered a logical extension of the mechano-centric interpretation of Platonic philosophy as advocated by Severini. As a matter of fact, the signatories of the fifth De Stijl manifesto had long since announced that "In close co-operation we have examined architecture as a plastic unity made up of industry and technology and have established that a new style has emerged". [32]

On the other hand, and to the ultimate detriment of the movement, all its former proponents, including Van Doesburg, gradually started to ascribe to, in Frampton's words (1968, 1991: 151), "left-wing anti-art constructivist concepts in which social forces and the means of technical production are seen as spontaneously determining form, independent of any concern for the 'ideal' forms of a universal harmony" [emphasis added by author].

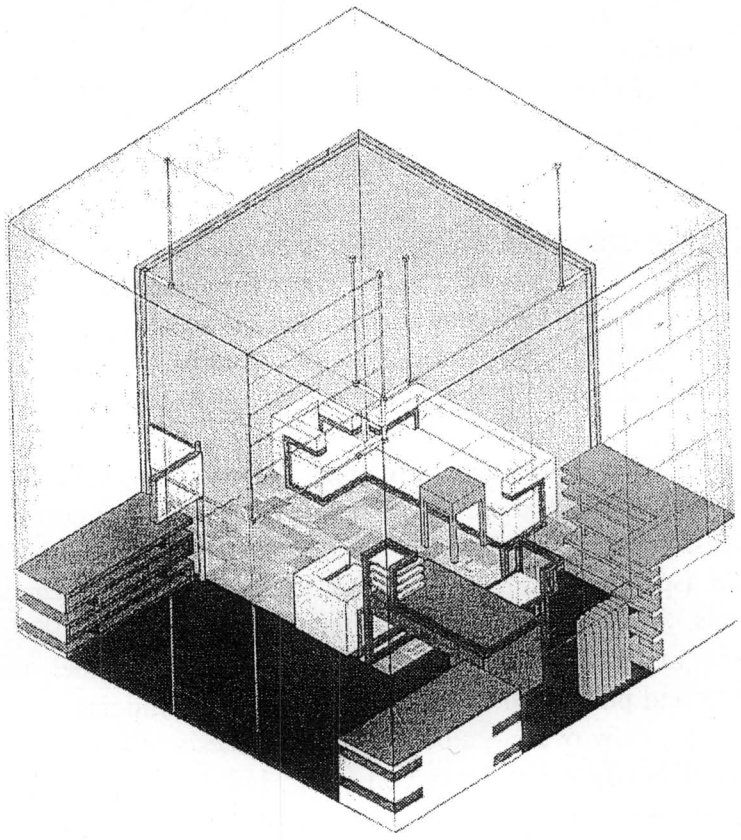
Rietveld's work developed in a comparable direction. Upon the completion of Schröder-Schäder House, he pursued a lively architectural career, but none of his ensuing commissions – commencing with Lommer House, Wassenaar (1927, *fig. 10.67*) – displayed the creative exuberance of the former project. Instead, Rietveld aspired to a plastic synthesis achieved through technological resolution and novel industrial materials. The Garage-*cum*-Chauffeur Flat, Utrecht (1927, *fig. 10.68*), was a revolutionary experiment in prefabrication, consisting of standard steel profiles and windows, reinforced concrete panels and perforated sheet metal. Despite the enticing technical opportunities on offer, Rietveld's work had virtually overnight become the antithesis of his previous explorations. With respect to the Garage-*cum*-Chauffeur Flat, Frampton (*ibid.*: 153) writes:

---

32 Van Doesburg, Van Eesteren and Rietveld, 1923, "'De Stijl': Manifesto V: - □ + = R4 – Towards Collective Building [Construction]", De Stijl [n. no.]; Conrads (ed.), 1970 ed.: 66.



10.73 Van Doesburg, House van Doesburg, Meudon (1930).



10.74 Gropius, Director's Office at the Bauhaus, Weimar (1923).

> "Certain points of Van Doesburg's plastic architecture may be counted as still being present, but most of them are absent. In spite of its pronounced asymmetry it is far from being anti-cubic. It is a definitive closed box. It structure is indeed skeletal but none of its planes appear to float in space ... Apart from the vertical and horizontal steel bands set at modular intervals to hold these concrete modules in position, there is no other differentiation to the simple cubic mass. However well proportioned, it is an architecture of objective technique, rather than a demonstration of neoplastic universal equilibrium."

By 1930, his Erasmuslaan Terraced Houses, also in Utrecht, displayed all the characteristics of the International Style, and were of no particular plastic distinction (*fig. 10.69*).

According to Warnecke (1991, 194) Van Doesburg initially opposed the all-encompassing functionalist approach that overruled independent aesthetic decision-making. If Café Bal Aubette was his last courageous reconciliatory effort, he, too, ultimately surrendered to the persuasive functionalist rhetoric. Frampton (1968; 1991: 154) concurs:

> "[After 1928] most artists who were still affiliated with the De Stijl idea, including even Van Doesburg, came increasingly under the influence of the anti-art 'new objectivity' which deriving ultimately from the preoccupations of international socialism, was primarily preoccupied with the technical achievements of a new social order ... By 1930 the neo-plastic ideal of a world of universal beauty had been eroded, firstly by internal inconsistency and controversy, and then later by the impact of external culture pressure".

The house that Van Doesburg designed for himself at Meudon in 1930 (*fig. 10.73*) demonstrated a radical departure from all his previous design postulates, including his sanctioned 16 points of a neo-plastic architecture. Except for the odd bit of colour selectively applied, both the appearance and philosophy of the house owed much to Purism, particularly the Citrohan prototypes and Le Corbusier's *objet-type* analogues. In a letter written to Kok, dated 23 January 1930, Van Doesburg expressed the following views:

> "As I was unable to imagine that the composition of equal relationships should be the final result of spiritual painting, I arrived at counter-compositions in 1924 ... And so I went from composition to construction, whereas now, in 1929, I have broken with all arrangements or compositions that are carried by emotions ..." (Warnecke, 1991: 81)

Van Doesburg evidently equated the "unemotional" with the anonymity of the International Style in which Oud had been engaged since the mid-1920s, as demonstrated in his various housing projects (*figs 10.70-72*). With the design of his own house, Van Doesburg had finally turned his back on the neo-plastic aesthetic to which he had been committed so ardently: De Stijl had run its course.

It is noteworthy that with the publication of *The International Style: Architecture Since 1922* in 1932, Hitchcock and Johnson omitted any examples of neo-plastic architecture. They were probably considered too idiosyncratic and closely derived from modern art to qualify for inclusion. [33]

---

33 Oud was the only Dutch architect associated with De Stijl whose work featured in the publication. These included his housing projects at Kiefhoek, the Hoek of Holland and at the Weissenhofsiedlung, plus a church-*cum*-community hall, also built at Kiefhoek in 1929. Le Corbusier's purist villas featured extensively but, surprisingly, only one building from the Soviet Union was included, namely, the Electro-Physical Laboratory, Lefortovo, Moscow (1927), by two obscure architects, Nicolaiev and Fissenko.

10.7 DE STIJL, IN CONCLUSION

In the final analysis, De Stijl was a frustratingly brief interlude in the history of modern architecture. With the notable exception of the Schröder-Schräder House, the full spectrum of its plastic potential remains unrealized. Although substantially less politically galvanized than the Constructivists and Suprematists, the proponents of De Stijl also succumbed to the polemics of Functionalism.

However, there can be no doubt that the mature architectural component of De Stijl was derived conclusively from artistic premises. In fact, Wright's influence during its formative years was distracting since it actually obscured the significance that neo-plastic painting could present modern architecture.

If the creative impetus of De Stijl was derived from Mondrian and Van Der Leck via Cubism, then the movement was personified by Van Doesburg, but tectonically realized by Rietveld in a couple of modest pieces of furniture and a single house. Consequently, a distinction can be made between neo-plastic architecture that was informed conclusively by neo-plastic painting, and examples that coincided in a peripheral sense with the aims of the De Stijl initiative.

Although Van Doesburg never realized the potential of his own plastic discoveries, it is noteworthy that he only came into his own, paradoxically, once he had established his independence from Mondrian, and been exposed to Suprematism and Constructivism. In hindsight, Van Doesburg's intention to imbue the supposed dynamic equilibrium of Neo-Plasticism with the planimetric mobility explored by Suprematists was – just as in the case of his dematerialization of mass in space – another missed opportunity. Warnecke (1991: 73) is of the following opinion:

> "Philosophically, De Stijl theory was irrelevant and far from original ... [Their] quotations and concepts from a variety of sources were taken over without regard to their original text, even if the views of the quoted scholars were totally incongruous ... As a result their [theoretical] content remained completely vague ... This does not alter the fact that it yielded great works of art."

Warnecke (*ibid.*) also maintains that the nebulous constitution of the movement resulted from the dogmatic pursuit of absolute aims. However, this assertion – and bearing in mind Van Doesburg's enigmatic personality – does not explain satisfactorily why the architectural contingent of De Stijl was so easily distracted and dissuaded from pursuing the content of their own plastic discoveries. Perhaps the Schröder-Schäder House – just as the Barcelona Pavilion – was so finite in its realization that the author had exhausted his own ingenuity.

The legacy of De Stijl was briefly extended at the Bauhaus where Van Doesburg's presence created considerable upheaval. [34] Although impressed with the Bauhaus as an educational institution, Van

---

34 Van Doesburg's criticism of the highly individualistic Bauhaus-approach made him immensely unpopular with the Expressionists. As a result, any aspiration that he might have had to become a member of the teaching staff was quelled, hence his opting for an independent route. Due to the popularity of Van Doesburg's course, Gropius was compelled to forbid any Bauhaus students from attending. An extract from a letter written by Van Doesburg to Kok, dated 12 September 1921, cited from Frampton (1968; 1991: 148), reads: "I have turned everything upside down in Weimar. That is the most famous Academy, which now has the most modern teachers! Every evening I spoke to pupils there and everywhere I scattered the poison of the new spirit. The 'style' shortly will appear again, more radical. I have any amount of energy and I now know that our ideas will triumph: above all and everything." See also Droste, M., 1990, *Bauhaus 1919-1933* (Cologne: Benedikt Taschen), 54-61, for a comprehensive account of Van Doesburg's impact on this famous design school. It was also only after Van Doesburg's departure that the school became more susceptible to outside influences.

Doesburg was critical of the expressionist approach to design tuition – based on intuition and subjectivity rather than geometrical and objectively universal precepts – of Swiss painter and pedagogue Johannes Itten (1888-1967), Kandinsky and Klee. Since Van Doesburg was never offered a teaching post, he initiated the "Stijl Course" of his own accord. As most of his students were Bauhäusler, the neo-plastic principles of primary colour and, subsequently, primary form, were adopted as the semantic vehicle of the distinctive "Bauhaus Style" of the mid-1920s. Despite the concerted efforts by Gropius, the school's first director, to thwart Van Doesburg's persuasive influence, even he succumbed to the more rationalized plastic approach of De Stijl, evidenced by the interior of his own office in Weimar (*fig. 10.74*). Van Doesburg's presence also forced Gropius to reflect on the direction of the school. As a result, Gropius aimed at a more integrated approach between art and technology, instead of between the arts and crafts. This was achieved after the adoption of the rudimentary means of artistic expression of Neo-Plasticism, which enabled a more effective reconciliation between the different aesthetic disciplines and culminated in designs far more suitable for mass-production.

Like all the heroic modern initiatives, De Stijl reflected the optimism of its age. Its proponents enthusiastically embraced the opportunity to create a utopian man-made environment that – as in the case of Classicism and Le Corbusier – corresponded to universal cosmic laws. With the exception of Van't Hoff, [35] the Dutch contingent of De Stijl was politically neutral – in part, a result of the history and *Volksgeist* of the Netherlands. Although sympathetic to the social idealism of Communism, Van Doesburg categorically rejected the subjugation of art and architecture to propagandist purposes, arguing that it completely contradicted the primary objective of aesthetic expression. This finds corroboration in Van Doesburgs's own words:

> "There is no such thing as art created by a proletarian, because a proletarian ceases to be a proletarian as soon as he creates a work of art. An artist, however, is neither a proletarian nor a bourgeois. He belongs to everyone. Art is a mental skill in a person, aimed at liberating him from life's chaos and tragedy. Art is free to choose its own means; it is only bound by its own laws and nothing else. As soon as a work becomes a work of art, it transcends all differences between social classes." (Warnecke, 1991: 86) [36]

At one stage or another, all the proponents of De Stijl ardently believed that art surpasses political and economic realities, and that it was a force sufficiently powerful to dissolve social antagonisms through its example and effect on society. Perhaps this naivety, the public's indifference to their work and the lack of a structured architectural programme of social implication ultimately undermined their own aesthetic cosmogony.

10.7 SUMMARY

This chapter reviewed the tectonic incarnation of the neo-plastic paintings of the Dutch aesthetic movement, De Stijl. Attention was drawn to the fact that the movement was neither cohesive, nor consistent in terms of principled pursuit. There were also surprisingly few examples that demonstrated convincingly the influence of the painterly enterprise. The architectural component of De Stijl was subjected to divergent interpretations and external influences that continually changed its character.

---

35 For a commentary on the dissent caused by Van't Hoff's communist orientations see Harmsen, G., "De Stijl and the Russian Revolution", in Friedman, M., 1982; 1988, *De Stijl: 1917-1931 – Visions of Utopia* (Oxford: Phaidon), 45-50.

36 From Van Doesburg, T., 1923, "Anti-Tendenskunst", *De Stijl*, vol. 6, no. 2.

The architectural component of De Stijl developed through three different stages. The formative years, from 1914 until 1920, were dominated by the theories and work of Frank Lloyd Wright, which coincided with the aesthetic cosmogony of Neo-Plasticism. The few projects built in a Wrightian idiom made no particular spatial or formal contribution, and the neo-plastic principles were applied in a highly decorative manner.

De Stijl reached its zenith between 1921 and 1924 – both pictorially and architecturally. This stage came about as a result of the discovery of the design talents of the carpenter-*cum*-architect, Gerrit Rietveld, who, independently, had given utilitarian expression to elemental painting. His renowned pieces of furniture, the *Red-Blue Chair*, *Hanging Lamp* and *Berlin Chair*, precipitated the formal and spatial language of the architectural apogee of De Stijl, the Schröder-Schräder House. Other examples that demonstrated the painterly influence most authentically can be restricted to the hypothetical projects of Theo Van Doesburg and Cor Van Eesteren – prepared for the retrospective De Stijl exhibition, hosted in Paris in 1923 – and Johannes Pieter Oud's Café de Unie of the following later. Mies van der Rohe can be considered the successor of Van Doesburg's spatial explorations as realized so magnificently in his Barcelona Pavilion.

The third and last stage of De Stijl was dominated by El Lissitzky's influence on Van Doesburg, the incorporation of the diagonal as part of the neo-plastic repertoire, and the adoption of Elementarism as a means of imbuing Neo-Plasticism with a planimetric dynamicism that surpassed the hierarchial distribution of colour and linear accents. Elementarism made its presence felt in only two projects, of which Café Bal Aubette was the more important.

When Van Doesburg, like Oud and Rietveld, succumbed to the persuasive functionalist design rationale of the International Style, this brief aesthetic interlude in the history of modern architecture drew to a close.

CHAPTER 11 SUMMARY OF FINDINGS AND CONCLUSIONS

11.1 PREFACE

This thesis assessed the impact of the visual arts on architecture, with specific reference to modern art and the heroic period of modern architecture.

The principal objectives of this academic enquiry have been to indicate that, firstly, the genesis of modern architecture owes a great deal more to artistic pursuit than is generally acknowledged. Secondly, the increasing preoccupation with utilitarian tenets undermined the aesthetic intentions of the pioneering Modernists and contributed significantly to the vilification of the Modern Movement.

Given the revived interest in the architectural endeavours of the Heroic Modernists, the longer-term objective is to enable a more valid assessment of the current neo-modern initiatives *à propos* the originating design precedent.

In achieving these aims, this thesis was premised on the following presuppositions:

1. The visual arts provide a plausible model for tracing the evolution of architecture.

2. The depiction of pictorial depth coincides with, and even pre-empts, the expression of plastic space.

3. Modern art – Cubism, in particular – was the seminal influence on the codification of a modern architectural vocabulary.

4. The polemics of Functionalism obscured the semantic contribution of Heroic Modernism that was derived, conclusively, from the visual arts.

In support of these postulates, this study commenced with a reflection on the classical aesthetic in order to contextualize the genesis of the modern aesthetic, and also to amplify the antithetical position adopted by modern artists and modern architects with regard to the stifling classical aesthetic ideal – albeit to a varying degree.

11.2 THE SELF-CONSCIOUS REVERSAL TO THE ASPECTIVAL

The chapter entitled "The Classical Ideal of Beauty" indicated the numerical correspondence between musical harmony and the organizational structure of all natural and cosmic phenomena precipitated the aesthetic axiom that sensory gratification can be ascribed to specific algebraic ratios. It was evidently concluded that man-made artefacts that emulate these transcribed mathematical conventions would embody the harmony prevailing in nature, constituting the classical perception of beauty. These metaphysical dispositions found support in Plato's aesthetic doctrine of an idealization of mimetic representation, based on natural and optical canons. Thus, classical aesthetic theory – founded on Pythagorean numerology, an idealized geometric portfolio, and Platonic dogma – established, intermittently, the normative Western aspiration for creative endeavour.

Plato's presupposition of an absolute beauty implied, on the one hand, that all forms of creative expression should aspire to the aesthetic ideal. But, on the other hand, those endeavours would remain inherently imitative. Consequently, it can be advanced that both classical art and classical architecture shared the same conceptual premises in that both were intrinsically mimetic. Classical art was an idealized rendition of the natural prototype. Classical architecture, in turn, was a geometric – or an abstract – reproduction of nature, imitating the laws of vision and of nature.

Obviously, to achieve the desired sense of life-like represention, the creation of an illusion of depth on a two-dimensional surface would be imperative. Despite contention, there is ample pictorial and architectural evidence to suggest that the ancient Greeks had substantial knowledge of perspective – with perspective a cardinal factor in the entrenchment of naturalistic depiction and the reinforcement of visual observation; a prerequisite for realizing the mimetic premises of Classicism.

Following this train of thought, it is not surprising that Judaeo-Christian dogma – and, particularly, the prohibition on creating any form of likeness – would have radically altered classical aesthetic aspirations and coinciding conceptual design premises. As a result, the anti-naturalistic disposition of the theological paradigm during the Middle Ages must have contributed (and perhaps more self-consciously than one is generally inclined to assume) to the necrosis of perspective, the development of different conceptual premises, and the reversal to an aspectival mode of visual communication. It is equally significant that the algorithm of perspective during the Renaissance resulted in the reinstatement of the Platonic aesthetic ideal, and in the consecration of the classical design methodology and architectural repertoire.

However, as argued in the chapter entitled "The Cogno-Preception of Space", perspective was not only a facilitating means of enforcing the mimetic aspirations of Classicism. More importantly, the manner in which pictorial depth is organized is indicative of a certain cognitive perception of space that coincides with, and even pre-empts, the expression of plastic space. By way of example, the aspectival mode of pictorial rendering during the Middle Ages was a product of Biblical conditioning, totally unrelated to observational or scientific evidence, and matched the hierarchical symbolic expression of plastic (or habitable) space as demonstrated in liturgical structures.

By contrast, the classical cognition of space was initially informed by acute observation and later substantiated by scientific evidence during the Renaissance, though, in both instances, entrenched by Euclidean geometry and knowledge of perspective. Yet, in neither instance was the conception of plastic space an independent consideration. Rather, it was the consequence of geometric form, with perspectival adjustments encouraged to reinforce visual observation. In other words, although symmetrical edifices, comprising pure geometric form, were conducive to a perspectival mode of rendering, classical buildings were intentionally designed to coincide with their manner of depiction. Consequently, it can be advanced that the classical perception of plastic space was perspectival and depth-related, but never perceived as an entity of independent existence that could be manipulated for purposes other than optical considerations.

In furthering the highly underrated consideration of the impacting role of the visual arts on architecture, the chapter entitled "The Mechanization of Vision" contested the prominence generally given to the Industrial Revolution with regard to the appropriation of a contemporaneous architectural idiom. It was advanced that although industrialization was a crucial factor in this regard, it played a catalytic role. Admittedly, technological progress did spawn new design challenges and did call for novel building typologies. Yet, none of the stylistic alternatives explored during the 19th century provided convincing design solutions for the demands at hand. By way of opposition, it was argued that the advent of photography was the most decisive influence on the review of past aesthetic premises, and on the consequential development of new and more plausible conceptual points of departure in the architectural arena.

Subsequent to the Renaissance, both the merit and credibility of Western art were once again premised on the Platonic aspiration for mimetic reproduction and optical accuracy. It is obvious that photography – as the most concrete form or visual observation – would challenge the imitative premises of art, and, as a result, the definition or art *per se*. As been set forth, the resultant reappraisal of the Western perception of art led to new approaches to artistic subject matter and to novel pictorial techniques. But, most importantly, it stimulated an appreciation of non-Western artistic endeavours.

So-called primitive artists – indifferent to life-like representation and oblivious to perspective – taught that neither the pursuit of art, nor the merit of art, has to rely on, or be defined in terms of, optical accuracy. This realization enabled Western fine artists to be foremost in discarding classical aesthetic doctrine and its supposedly immutable canons, precipitating the self-conscious reversal to the aspectival mode of pictorial rendering.

Bearing in mind the symbiotic relationship that exists between the depiction of pictorial depth and the expression of plastic space, the impact of Picasso's *Les Demoiselles d'Avignon*, and the subsequent development of Cubism, on the architectural arena cannot be over-emphasized. In addition to countering past aesthetic preconceptions and revoking previous artistic preoccupations, Picasso's decision to synthesize different viewpoints into a single optical experience served as the most dramatic violation of visual evidence and supporting pictorial conventions. This particular act severed, finally, all ties with the imitative premises of Classicism and its coinciding perspectival means of portrayal.

Picasso's interpretation, however, differed from other aspectival versions in that it did not stem from an interest in the semiotic properties of the subject matter. Rather, it stemmed from a preoccupation with the depiction (if not the semiotic property) of volume, amplified by Cézanne's tentative artistic explorations and African sculpture. The portrayal of simultaneous views implied that pictorial depth did not have to rely on perspective or any other illusionary device to communicate the volumetric propensity of an object. Indeed, volume could be conveyed through association, and by implication, through stylized pictorial means. This cognition spawned the reductive methodology of Cubism, setting in motion a chain reaction of pictorial events that led to a non-naturalistic and inherently self-referential form of art. Moreover, Picasso's extraordinary decision to compress what normally occurs in time and through space into a single optical experience alluded, on the one hand, to the role of time and space as autonomous aesthetic concepts. On the other hand, it demonstrated the relativity of both object and observer – an artistic condition that coincided with the Einsteinian cosmological paradigm. In addition, the synthesis of multiple vantage points induced an imaginary sense of movement, introducing a virtual mobility to the static realms of the pictorial arts.

Due to the alliance between the cognitive perception of cosmic space, the depiction of pictorial depth and the enclosure of habitable space, it was inevitable (particularly in hindsight) that the conclusions drawn from *Les Demoiselles d'Avignon* would have impacted on the expression of plastic space. In contrast to the historical examples cited, the realization that space could be perceived as a premeditated aesthetic concept heralded incalculable consequences for the entire spectrum of the plastic arts, pre-empting the conscious manipulation of habitable space.

However, cognizance of the far-reaching implications of the spatial revelation of Cubism did not occur instantly. Even Picasso and Braque, preoccupied with the pictorial implications of space, were oblivious initially of the unifying role space could play between fine art, sculpture and architecture. It is noteworthy that although the spatial content of Cubism promptly elicited theoretical discourse – even in architectural circles [1] – all the earliest attempts at a cubist-inspired architecture failed dismally at realizing the spatial significance of Cubism. It was more than a decade after the painting of *Les Demoiselles d'Avignon* that its spatial implications were internalized adequately to exceed beyond the faceted surface embellishment and prismatic formal treatment of Duchamp-Villon, the prolific Czechs, the Expressionists, and some of the pioneering Soviet architects – significantly, once the literal (or mimetic) interpretation of Cubism had been transcended.

---

1 Refer foremost to the writings of the Czech architectural theorists and practitioners. See, in particular, Von Vegesack, A. (ed.), 1992, *Czech Cubism: Architecture, Furniture and Decorative Arts 1910-1925* (New York: Princeton Architectural Press).

Thus, in the architectural arena, the new spatial consciousness evolved over a period of time and, more specifically, as a result of further developments in the visual arts. This was achieved, paradoxically, through the negation of pictorial depth and, even more ironically, by extrapolating the two-dimensional pictorial discoveries into the third dimension.

11.3 THE IMPACTING ROLE OF CUBISM ON MODERN ARCHITECTURE

As mentioned, the honing of the perception of depth stemmed from Picasso's interest in the depiction of volume without resort to conventional pictorial procedures. Following Cézanne's example of the prismatic treatment of form, the pictorial content was subjected to a series of reductive stages. This process of formal simplification not only exposed the geometric substructure of the object, but also prompted its dematerialization from form to plane and, ultimately, to shape. Remarkably, even in its most dematerialized state it was still possible to convey the volumetric propensity of an object, introducing a radical artistic inventory to imply – metaphorically-speaking – pictorial depth.

Since the Cubists never relinquished their ties with the phenomenological content of their subject matter, it was the abstract artists who pursued the planimetric aspects of Cubism to its logical conclusion, recognizing that the rudimentary principles of art are legitimate artistic subject matter and worthy of independent pursuit. The chapter entitled "The Pictorial Derivatives of Cubism" discussed how Mondrian was able to arrive at total abstraction only once he had dispensed with the narrative, and having discarded all allusions to pictorial depth. By default, the negation of depth reaffirmed the autonomy of space as a viable aesthetic concept, amplifying also the distinction between volume, depth and space.

If Mondrian had consciously negated pictorial depth, Malevich, in turn, was infinitely preoccupied with the notion of space – suggested by title and echoed in his writings. However limited his pictorial arsenal, Malevich exploited the optical tensions and spatial ambiguities that could be achieved with minimal planimetric means. Even the apogee of abstract art, *Suprematist Composition: White in White* (1917/18), was a statement on the defiance of gravity and the infinity of cosmic space. Having exhausted his pictorial repertoire, it was inevitable that Malevich would direct his energies to three-dimensional explorations, concurring with the developments in the plastic arts arena.

Picasso's and Braque's occasional venture into sculpture from 1912 onwards demonstrated the ease with which the volumetric illusions created pictorially could be conveyed in both media; how the semiotic properties of space could be explored equally effectively in the third dimension. As noted in the chapter entitled "The Volumetric Incarnation of Cubo-Futurism – The Soviet Avant-Garde", it was the first time in the history of the plastic arts that mass and volume were being implied instead of physically created. By abandoning traditional plastic preoccupations, modern sculptors – like their fine arts counterparts – were able to pursue space as plausible artistic subject matter. The dematerialization of mass and volume – as with the planimetric metamorphosis of form – signaled the advance from the two-dimensional to the three-dimensional, with its own inherent spatial potential. Novel plastic concepts – such as space versus residual space, positive versus negative volumes, solid versus void, opacity versus transparency – contributed to an extended three-dimensional repertoire that was germane to the semantic development of Heroic Modernism.

Thus, these seminal spatial developments in both the pictorial and the plastic arts contributed collectively to the premeditated expression of space. The spatial constructions of the Constructivists, the Prouns of the Suprematists, the so-called four-dimensional decompositions of the De Stijl architects, and the space-time manifestations of Le Corbusier all bear testimony to the spatial consciousness induced by Cubism; to the conscious manipulation of habitable space.

In concluding the assessment of the impacting role of the visual arts on the semantic development of Heroic Modernism, numerous avenues can be pursued to reinforce the connection between modern art and modern architecture. Apart from the profound spatial and volumetric implications of Cubism, the ensuing summary highlights additional architectural considerations that have their origins in its conceptual content. As Blau and Troy remark in *Architecture and Cubism* (1997: 10):

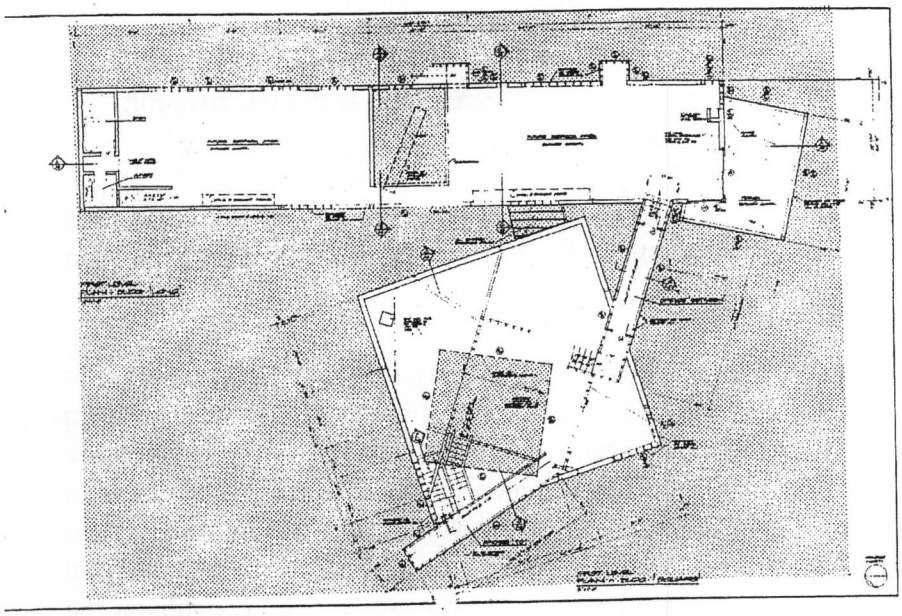
> "... the relationship between Cubism and architecture becomes meaningful when we abandon a literal or historical definition and focus on [its] conceptual links ..."

This observation provides some explanation for the difficulty generally experienced by architectural theorists – if not by architects themselves – to establish a plausible connection between these two autonomous disciplines.

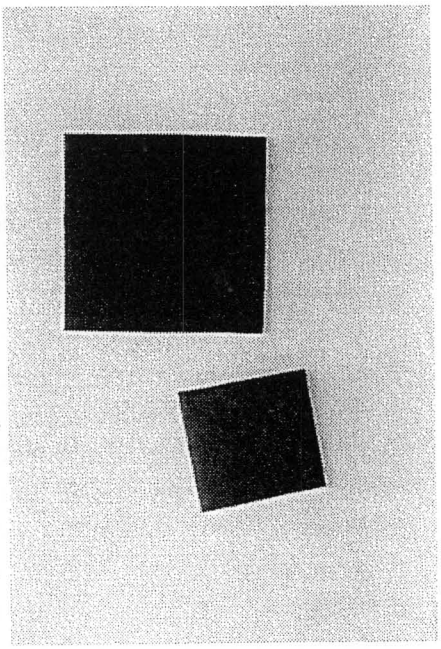
Picasso not only violated classical aesthetic criteria, but the radical, modern aesthetic that materialized in the visual arts called implicitly for an architectural equivalent. If the prismatic treatment of form provided one entrée into a cubist-induced architecture – however unconvincingly – the planimetric aspect of Cubism presented another. The 'legitimacy' of the two-dimensional – which the Classicists so desperately tried to disown – resuscitated a consideration for composition and resulted in endless graphic permutations. These planimetric notations found a literal counterpoint in architectural drawings – even architectural conventions – with the one increasingly informing, even resembling the other. The acceptance of the canvas as a two-dimensional entity furthered the relationship between the pictorial and the architectural surface, with the same tactile sensations, compositional means and organizational principles applicable to both disciplines. Both the Neo-Plasticists and Le Corbusier reverted to classical numerological systems as the primary means of compositional organization. Furthermore, the laboratory work of the Soviets and the curriculum of the Bauhaus were premised on design exercises that investigated the application of the rudimentary aesthetic principles pertinent to both art and architecture, and generally taught by abstract artists.

Concurring with its semantic denotation, the geometric propensity of Cubism further entrenched the correspondence between modern art and modern architecture. The reductive methodology of Cubism also coincided with the antiquated process of decoding nature and transcribing it as geometric configurations. However, due to the self-referring character of modern art, the natural precedent was transcended and resulted in an abstract formalism that was pursued toward non-perceptual ends. The geometric inclination of Cubism also encompassed a distinct tectonic quality and technical expediency that coincided with the techno-scientific climate of the Machine Age, in addition to the rationalist ethos advocated since the late 17th century. In the final analysis, the abstract formalism emblematic of modern architecture, and devoid of any superfluous decoration, was considered a fitting response to the non-figurative, modern aesthetic spawned by Cubism.

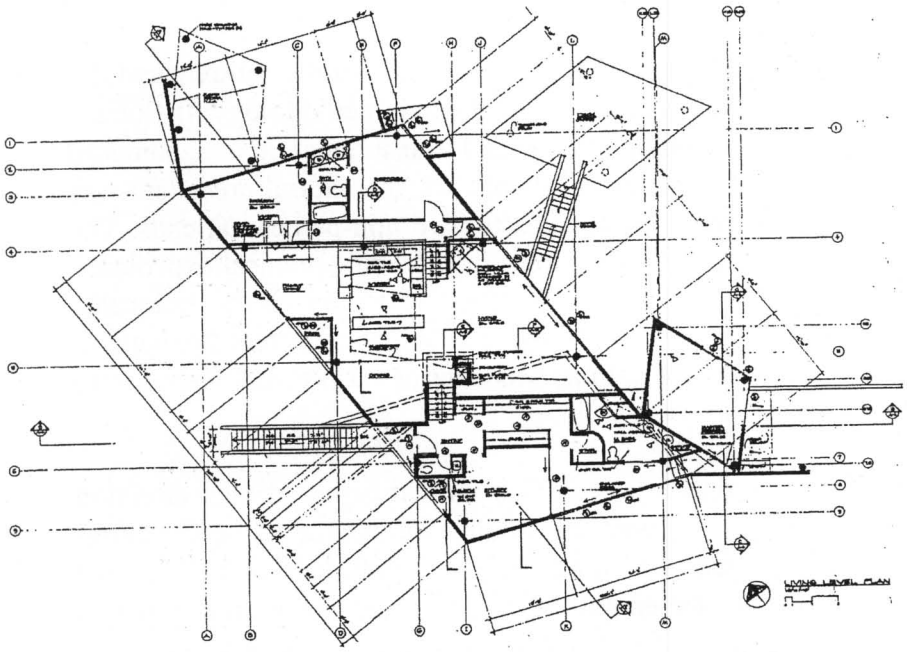
In the case of the Purists, it was the phenomenological aspect of Cubism that captured their attention and provided the vehicle for conveying their theoretical presuppositions. Paradoxically, Le Corbusier (like Mondrian) was only able to internalize, and take advantage of, the significance of his pictorial explorations once he had disengaged from the phenomenological and pursued the plastic potential inherent in his disassembled subject matter. Despite Le Corbusier's initial lack of reference to space, coupled with the extraordinary fact that he never engaged in an interim volumetric stage of artistic development, this study corroborated the profound influence of his paintings on the honing of his plastic and spatial sensibilities.



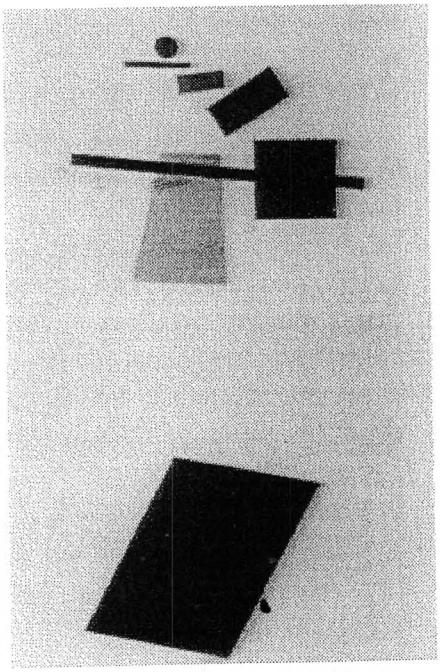
11.1 Gehry, Plan of Familian Residence, Santa Monica (1978).



11.2 Malevich, *Suprematist Compositio Red Square and Black Square* (1914/5)



11.3 Gehry, Plan of Wagner Residence, Malibu (1978).



11.4 Malevich, *Football Match* (1915).

The kinetic aspect of Cubism – though pursued far more literally by the Futurists – also engendered substantial architectural response. On the one hand, the multiple vantage points, indicative of the aspectival mode of pictorial rendering, found expression in Le Corbusier's purist villas that consisted of elaborate voyages through time and space. On the other hand, the mobile antics of the Futurists captured the attention of the pioneering Soviet architects who imbued modern architecture with a dynamicism – both static and mechanical – unbeknown in the history of architecture.

The metaphorical aspect of Cubism contributed to an extensive plastic inventory, compounded by an array of new building materials. The pictorial ambiguities and contrasting effects that had resulted from the cubist techniques of superimposition, simultaneity and suggestion harboured enormous plastic potential and were explored to great effect in the architectural arena. The layered and transparent sensations – emblematic of glass curtain wall construction, in particular – are the tectonic aspects most often cited by architectural theorists with regard to Cubism. [2]

Given these novel architectural considerations, the semantic development of Heroic Modernism was indebted, conclusively, to the genesis of Cubism. By way of example, Purism materialized exclusively as a result of Cubism – albeit counter-active and in response to its ostensible deficiencies. Moreover, Le Corbusier's painterly investigations, concurring with the reductive methodology of Cubism, enabled him to internalize the tectonic advantages of his structural innovations, and to evolve a plastic phenomenology and spatial repertoire that sustained him throughout his entire architectural career. In turn, modern Soviet architecture was premised on the volumetric implications of Cubism, though imbued with the mobility of Futurism. The unique laboratory work of the Constructivists is testimony to the creative impetus generated from intent artistic experimentation modelled after cubo-futurist examples. De Stijl architecture – epitomizing the three-dimensional incarnation of abstract art – successfully combined the planimetric, geometric and aspectival aspects of Cubism with the visual equilibrium of a universal aesthetic cosmogony.

11.4 THE POLEMICS OF FUNCTIONALISM

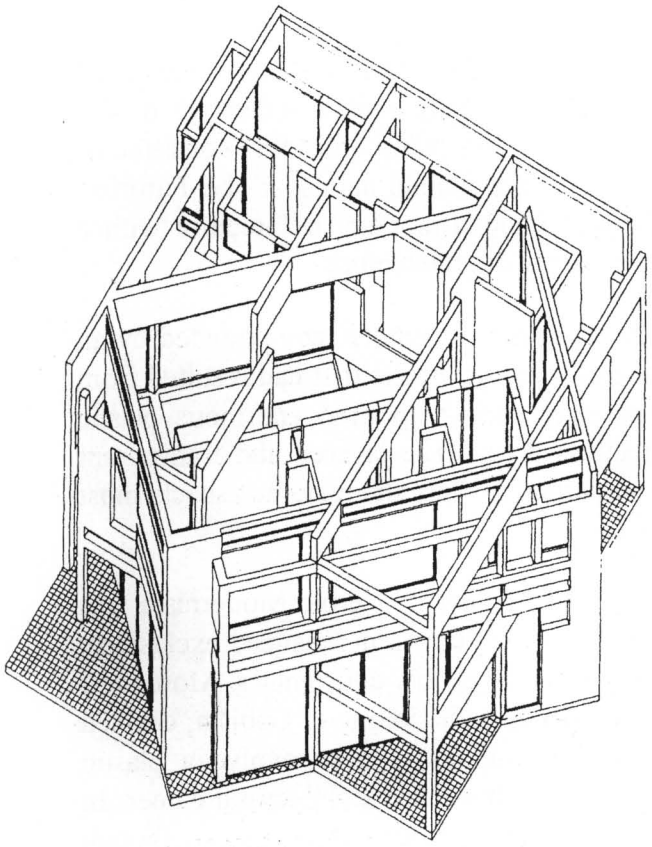
Lastly, attention was drawn to the undermining influence of the functionalist disposition on the artistic *tour de force*. This contention found support in the systematic analyses of the impacting role of the visual arts on the evolution of the selected architectural movements, as well as in the then-prevailing socio-political circumstances. As a case in point, social utilitarianism, spawned by communist ideology, ultimately invalidated the aesthetic premises of the laboratory work of the pioneering Soviet architects. By the early 1930s, all autonomous aesthetic decisions had either been politically stigmatized or had been overruled by (or been equated with) utilitarian considerations. Due to the example of the Soviets, even the proponents of De Stijl had succumbed to the persuasive functionalist ethos. In this regard it is worth reiterating the words of Oud (n.d.):

> "The spirit of De Stijl was, at first, my spirit as well ... But my conclusions were different: through the process of decomposition I gained a new sense of proportion, of space, atmosphere, line and mass, colour and construction, but I ... abandoned it and began to move in another direction: a healthy broad, universal and social architecture." [3]

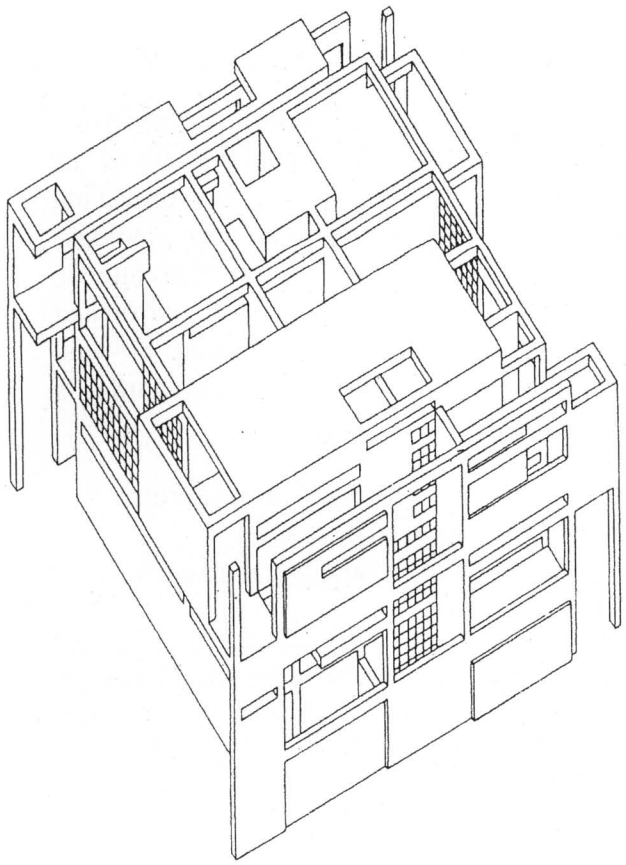
---

2 Giedion, S., 1941; 1967, *Space, Time and Architecture: The Growth of a New Tradition* (Cambridge, Mass.: Harvard Univ. Press), 494-495, was the first author to draw a comparison between the cubist device of simultaneity and the transparency emblematic of modern architecture, with reference to the Bauhaus Complex at Dessau (1926) by Gropius. This analogy was expanded upon in Rowe, C. and Slutzky, R., 1963, "Transparency: Literal and Phenomenal", *Perspecta*, no. 8: 45-54; and Rowe, C. and Slutzky, R., 1971, "Transparency: Literal and Phenomenal, Part II", *Perspecta*, no. 13/14: 287-301.

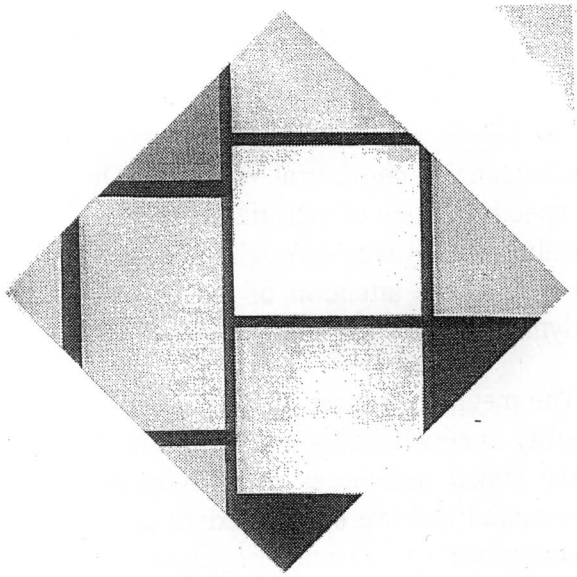
3 An extract from an undated letter Oud wrote to Bruno Zevi and of which this translation appears in Benevola, L., 1971, *The History of Modern Architecture, Vol. 2* (Cambridge, Mass.: MIT Press), 20.



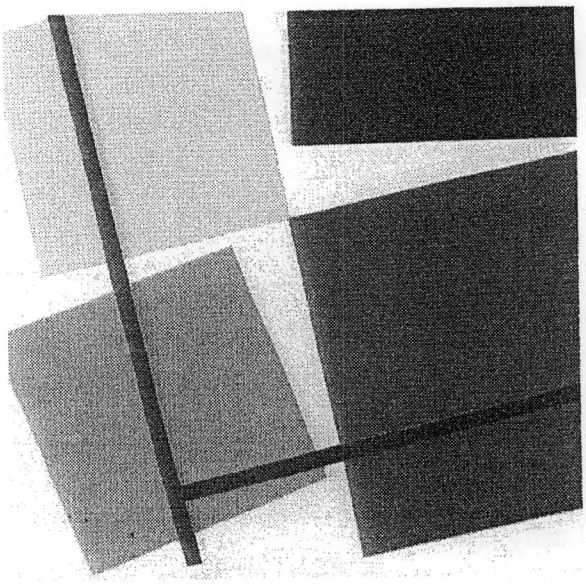
11.5 Peter Eisenman, axonometric, House III, project (1971).



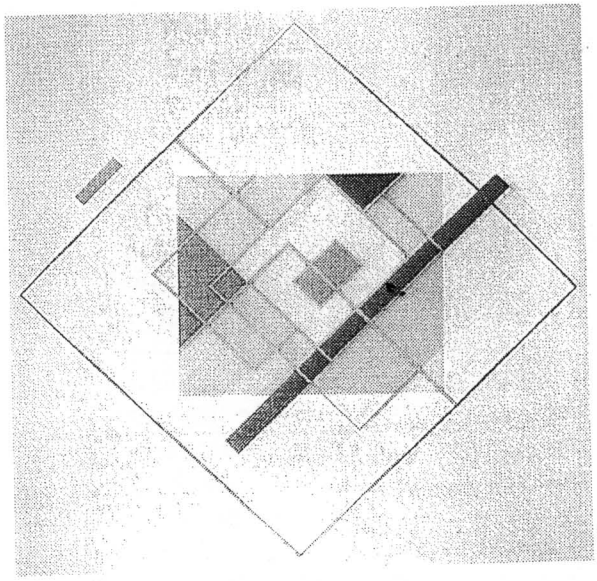
11.6 Eisenman, axonometric, House IV, project (1971).



11.7 Mondrian, *Lozenge with Blue, Yellow and Red* (1921-1925).



11.8 Van Doesburg, *Simultaneous Counter Composition* (1929).



11.9 Domela, *Neo-Plastic Composition, No. 20* (1930).

The political restrictions imposed on all forms of modernist expression by both Hitler and Stalin further marginalized any enquiries into artistic experimentation. With the outbreak of the Second World War, these novel design preoccupations that distinguished the embryonic years of modern architecture had either been surpassed by utilitarian premises or had been outlawed. Only Le Corbusier was able to thwart the onslaught due to his metaphysical functionalist rationale, which permitted him to continue to draw creative impetus from his painterly explorations.

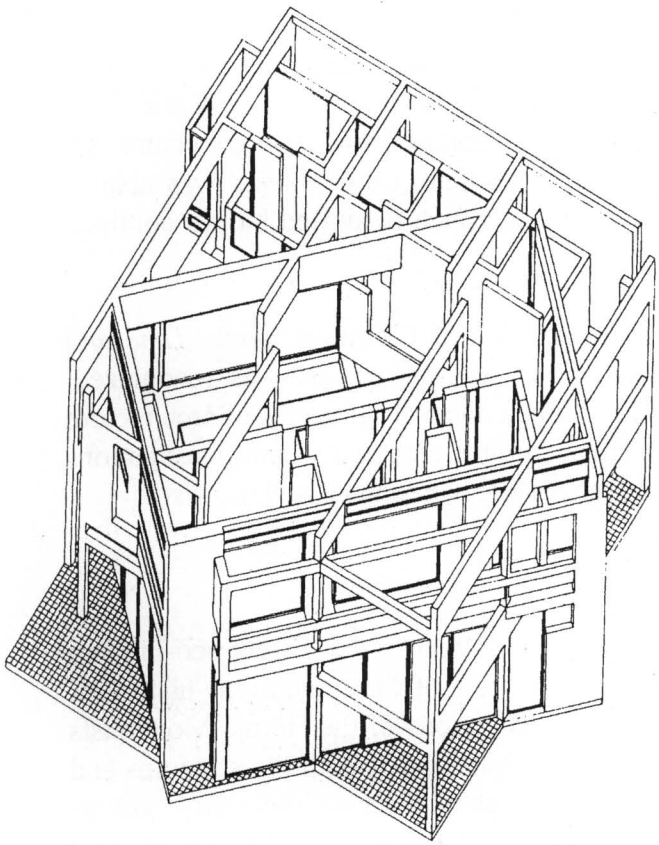
It was only after the Second World War, and due to the publication of Giedion's *Space, Time and Architecture* in 1941, that the worth of the tectonic derivatives of modern art was recognized. Regrettably, it was a period when these unique contributions to the universal semantics of architecture had been obscured by the indiscriminate implementation of functionalist tenets; when investigations into the spatial and plastic implications of a cubist-induced architecture had long ceased to exist.

11.5 CONCLUSION

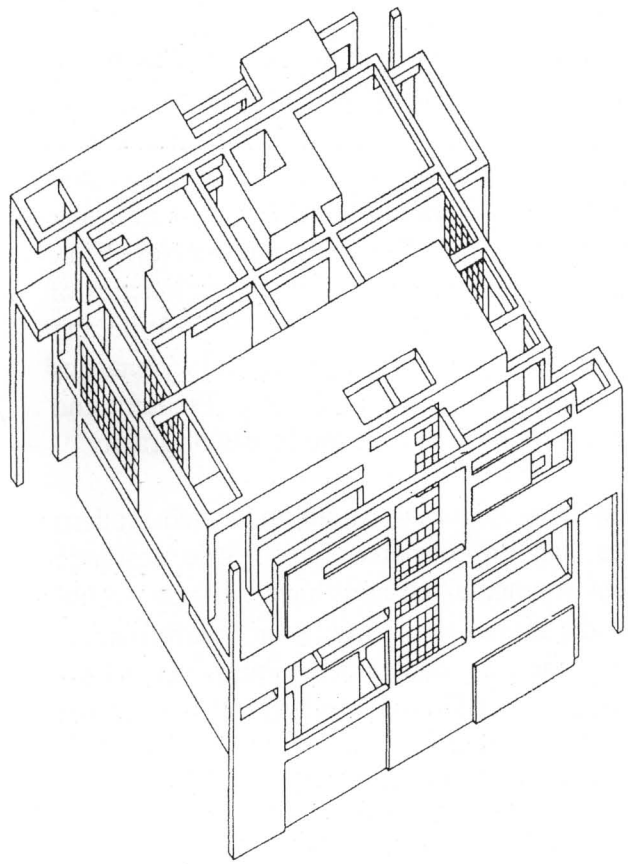
The longer-term objective of this thesis is to enable a more valid assessment of the current neo-modern initiatives *à propos* the originating design precedent. However, in view of the tumultuous history of modern architecture an indiscriminate reappraisal of the aesthetic intentions of the Heroic Modernists will be short-sighted. A modernist revival calls foremost for a re-evaluation of both the strengths and shortcomings of its predecessor. It must also be borne in mind that modern architecture – just as modern art – is, and will for the foreseeable future remain, a cultivated appreciation. Moreover, until such time as consensus can be reached on cohesive design principles that demonstrate the certainties of Classicism, contemporary architectural appropriation will remain subjective. Neither does this author promote the sacrificing of practical considerations in favour of aesthetic tenets. The successful integration of the utilitarian and the esoteric aspects of architecture is the overriding challenge to any architectural practitioner.

Notwithstanding, it is worth reiterating that the design repertoire of Heroic Modernism has by no means been exhausted; that its spatial and plastic implications have only partly been brought to fruition. The most challenging work produced currently demonstrates that the aesthetic intentions of the Heroic Modernists can be expanded upon considerably – examples that are often better executed than those of its pioneering proponents. Macrae-Gibson (1985: 18) refers to the earlier work of Frank Gehry as the ultimate incarnation of Malevich's paintings (*figs 11.1-11.4*). The *œuvre* of the New York Five gives fulfilment to the Elementarism of Van Doesburg, emulating also the planimetric kinetics of the Soviet avant-garde (*figs 11.5-11.9*). The abstract formalism of architects such as Tadao Ando and Mario Botta takes to an extreme the stoicism of purist architecture. In turn, the structural gymnastics evidenced by the work of Zaha Hadid, Coop Himmelblau, Daniel Libeskind, Bernard Tschumi and Rem Koolhaas challenge the laboratory work of the Constructivists, as much as the forces of gravity.

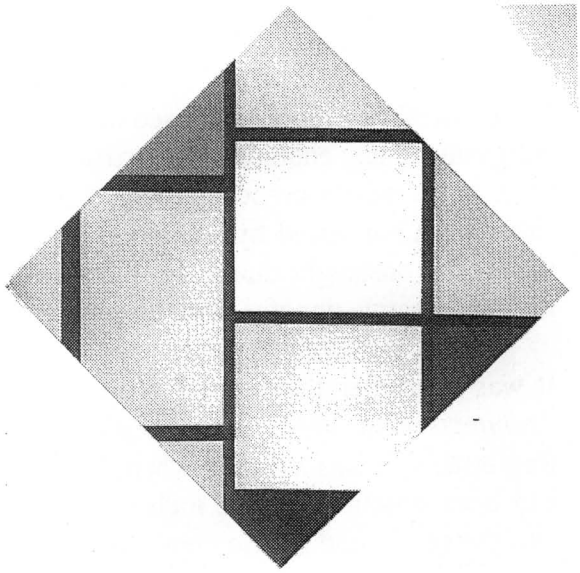
Concurring with the pluralism indicative of the prevailing post-industrial paradigm, a neo-modern revival calls for a reappraisal of earlier design examples that appropriated Eurocentric aesthetic canons, but adapted to particular socio-economic and environmental circumstances. These would include examples that never confused aesthetic considerations with utilitarian performance, accommodated climatic particularities and acknowledged vernacular building techniques, yet, whilst retaining and synthesizing the unique spatial and plastic inventory of Heroic Modernism. It is within this aspiration that the author premises her own commitment to architecture.



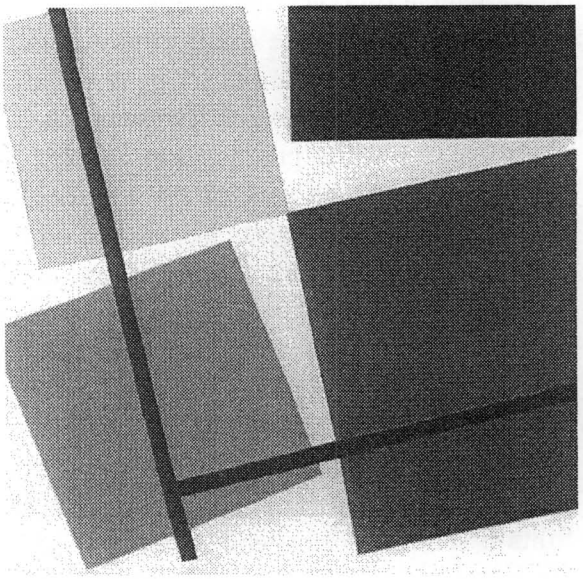
11.5 Peter Eisenman, axonometric, House III, project (1971).



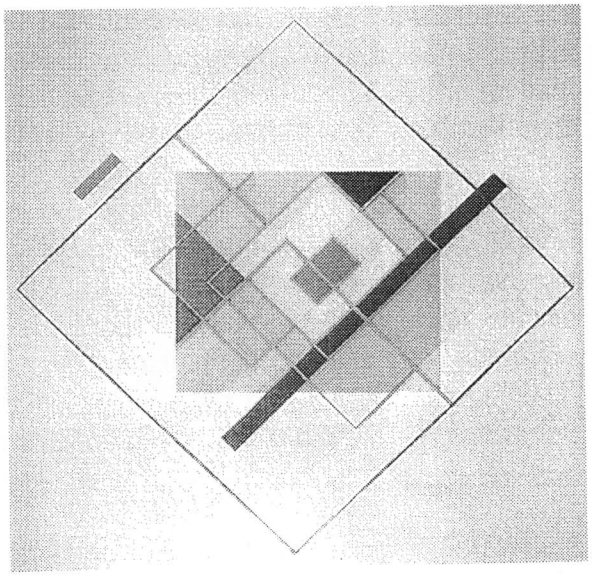
11.6 Eisenman, axonometric, House IV, project (1971).



11.7 Mondrian, *Lozenge with Blue, Yellow and Red* (1921-1925).



11.8 Van Doesburg, *Simultaneous Counter Composition* (1929).



11.9 Domela, *Neo-Plastic Composition, No. 20* (1930).

GLOSSARY

Abstract Expressionism (c. 1945-1960s)
Refers to the non-representational mode of painting exclusive to the USA that materialized towards the end of the Second World War. It was a complex synthesis of Cubism, the Expressionism as practised by Vasily Kandinsky (1866-1844) and Surrealism. Exposure to these European initiatives resulted from the School of Fine Arts, founded in New York in 1934 by the German immigrant Hans Hofmann (1880-1966), and the antics of Marcel Duchamp (1887-1968), who had been living in the USA for many years. Abstract Expressionism was concerned with self-exploratory imagery and techniques, coupled with bizarre strategies that imbued the creative process with total artistic freedom. The so-called action paintings by Jackson Pollack (1912-1956) epitomize the strategic objectives of this painterly genre. Other leading practitioners included Willem de Kooning (1904-1996), Mark Rothko (1903-1970), Ashile Gorky (1905-1948) and Barnett Newman (1904/5-1970).

Aesthetics
According to the *Webster New World American Dictionary* the term "aesthetic" is derived from the Greek *aisthetikos* (to be perceived by the senses). The noun "aesthetics" refers to that branch of philosophy that deals with the principles or conditions of beauty, qualified as sensuous gratification.

Alberti's Veil
A simple device developed by Leon Battista Alberti (1404-1472) in the 15th century to assist artists in constructing a perspectival rendering. It consists of horizontal and vertical threads stretched across a wooden frame to form a grid. When held at whatever is being observed, the converging construction lines can be accurately assessed and the data transferred onto a similar grid drawn on a sheet of paper.

Anamorphosis
A pictorial technique that causes the depicted object to appear completely distorted when observed head-on, but identifiable when viewed from a particular angle. The scull in *The Ambassadors* (1533, *fig. 2.23*) by Hans Holbein (1497/8-1543) is an excellent example of anamorphosis.

Art
The word "art" is derived from the Latin *ars*, translated as "skill". The term initially referred to the skilled practice of intellectual pursuits such as mathematics, music and poetry. It became associated with the visual arts only from the 14th century.

Artist
The noun "artist" was first used in Europe during the 14th century to refer to a person experienced in some craft-related activity. It was only during the Renaissance that artists gained status independent from artisans due to the specialized, even mathematical, knowledge that were required in the pursuit of artistic endeavour. This distinction became official in the late 18th century when artisans were refused entry to the Royal Academy in London, established in 1768. The academic differentiation between "Arts" and "Sciences" arose during the 19th century, when the supposedly scientific premise of painting was surpassed by less quantifiable characteristics, which the *Oxford English Dictionary* defines as "that in which sympathetic understanding plays a great part as opposed to the sciences where exact measurements and calculations are used".

Arts and Crafts Movement (c. 1836-1914)
The Arts and Crafts Movement emerged during the mid-19th century in England in the face of the industrial onslaught in the art-related arenas, and in response to anxieties expressed by architect and moralist Augustus Pugin (1812-1852) in *Contrasts*, published in 1836. Pugin's call to return to the design integrity demonstrated by medieval architecture was shared by John Ruskin (1819-1900), professor at Fine Arts at the University of Oxford and author of *The Seven Lamps of Architecture* (1849), amongst other publications. Ruskin's opposition to the degenerative qualities of machine production, his anti-classical stance and pro-gothic sentiments influenced the prolific designer, William Morris (1834-1896). Morris, fellow architect Philip Webb (1831-1915) and various Pre-Raphaelite artists found a design enterprise that specialized in furniture, textile and wallpaper design based on medieval principles. Webb's famous Red House, Kent (1859) – a synthesis of a simplified Gothicism, local building materials, traditional building methods and excellent craftmanship – epitomized the aspirations of the Arts and Crafts Movement and were furthered by the likes of William Lethaby (1857-1931), Charles Voysey (1857-1941) and Charles Ashbee (1863-1942). The so-called Garden City proposals developed by Ebenezer Howard (1850-1928) were also intimately linked to the Arts and Crafts Movement

sharing socialist and utopian sentiments. The Arts and Crafts Movement persisted until the outbreak of the First World War, when Lethaby, in particular, realized that a gothic revivalism could not meet contemporaneous demands, and that the onslaught of industrialization could not be ignored. Instead, Lethaby urged his fellow practitioners to look to the Deutsche Werkbund for a meaningful reconciliation between craft and industry.

Bauhaus (1919-1933)

The founding of the Bauhaus in April 1919 is regarded as the culmination of the reformed policies introduced to art and craft education by German architect and theorist Hermann Muthesius (1961-1927), via the Deutsche Werkbund. It was an amalgamation of the two existing art academies in Weimar – the Grand Ducal School of Arts and Crafts, founded by Belgian architect Henri van der Velde (1863-1957) in 1906 (and closed in 1915), and the Academy of Fine Art, established long before. Following Van der Velde's forced resignation, architect Walter Gropius (1883-1969) was nominated to combine both programmes and encourage closer co-operation between the visual arts and craft industries.

The school's development closely corresponded to the terms of office of its three appointed directors and leading teaching staff. Gropius headed the school from 1919 until 1928 at both Weimar and Dessau, and accumulated an impressive teaching body. Since many of those teachers were renowned abstract or expressionist artists, teaching provided them with an opportunity to systematize their own creative processes, test the validity of their aesthetic premises and contribute to a unique design curriculum. Among the first to be appointed in 1919 were Johannes Itten (1888-1967) – a former elementary school teacher-*cum*-art theorist – graphic artist Lyonel Feininger (1871-1956) and sculptor Gerhard Marcks (1889-1981). Artist Georg Muche (1895-1987) and music teacher Gertrud Grunow (1870-1944) were appointed in 1920. Klee, choreographer Oscar Schlemmer (1888-1943) and playwright Lothar Schreyer (1886-1966) were invited to join in 1921, and Kandinsky in 1922. Most of the recruited craftsmen were appointed on contract basis, but often lacked teaching skills and aesthetic judgement. To overcome these shortcomings, a bipolar education system was adopted to integrate theoretical content with practical implementation. A so-called Master of Form and Master of Craft were assigned to each of the respective workshops. These included book binding, graphic design and printing, joinery and furniture design, weaving, pottery, sculpture, and so forth, resorting under different materials – fabric, metal, timber, stone, glass, etc.

The incubation period – the so-called expressionist phase – of the Bauhaus, dating from 1919 to 1922, was dominated by the idiosyncratic personality and teaching methodologies of Itten. His compulsory "Vorkurs", derived from various pedagogical sources, served as the foundation for all the different craft programmes, supplemented with courses on colour and form offered by Kandinsky and Klee. During this time, Haus Sommerfeld, Berlin (1921), designed by Gropius and his partner, Adolf Meyer (1889-1954) for building contractor Adolf Sommerfeld, was the first Bauhaus demonstration of the synthesis of the art and craft disciplines. The design of the house was an amalgamation of labour-intensive, expressionist practices and Wright's Prairie Houses, with distinctly Art Deco overtones. Itten's opposition to commercial commissions of this nature, coupled with the persuasive influence of De Stijl on the design direction of the school, contributed to his resignation in April 1923.

Van Doesburg's visit, Itten's departure and the appointment of his successors – painter and art theorist Josef Albers (1888-1976), and Hungarian artist and photographer László Moholy-Nagy (1895-1946) – heralded the second and mature phase of the school's development. Whereas the initial years were dominated by existential and metaphysical values, the emphasis had shifted towards utilitarian concerns and industrial manufacture. Since the Bauhaus was a government institution, it was particularly sensitive to political fluctuation. Gropius soon realized that the school's economic survival depended on commercial ventures and mass production. To achieve this aim, the synthesis between the arts and crafts was superseded by a marriage between art and technology. The rudimentary principles of artistic expression – primary form and primary colour – were, after the example of De Stijl, adopted as the semantic vehicle for reconciling the various disciplines and achieving these new aims. As a result of Maholy-Nagy's familiarity with the laboratory work of the Soviet art institutions, three-dimensional spatial exercises were introduced for the first time, executed in broad range of modern materials. As the theoretical content of the curriculum became more coherent and production-oriented, designs were increasingly simplified for machine manufacture and mass consumption. The compelling results on display at various trade fairs established the school's international reputation as the leader in contemporary design. The experimental Haus Am Horn, built as part of the "Bauhaus Ausstellung" in Weimar in 1923 and designed by Muche and supervised by Adolf Meyer, was a triumph to Functionalism and contemporary living. It also featured the first truly modern kitchen – the supposed laboratory for cooking – complete with industrially manufactured furniture and appliances.

The increasing political opposition to the Bauhaus culminated in the school's transferral to their new premises in Dessau in December 1926 where the entire complex was designed by the staff and students. Not only did the Bauhaus building epitomize modern design in Germany, but it also firmly established Gropius' reputation as one of the world's leading modern architects. The school operated on the teaching tradition established at Weimar, with only minor adjustments made to the curriculum. An architectural department was finally established in April 1927, headed by the Swiss

architect and town planner, Hannes Meyer (1889-1954), an enthusiastic proponent of the Neue Sachlichkeit and outspoken Marxist.

Following Gropius' resignation in March 1928, Hannes Meyer was appointed director. Based on Meyer's political convictions, all design processes were subjected to social and utilitarian considerations, and the curriculum structured accordingly. Meyer rejected all notions of art, maintained that design should be determined by the propensities of material and the requirements of its users, and propagated "necessities" before "luxuries". These design orientations caused tremendous conflict and resulted in the resignation of Moholy-Nagy, Schlemmer, Klee and former student appointees, Marianne Brandt (1893-1983) and Marcel Breuer (1902-1981) – events that precipitated Meyer's dismissal in August 1930.

Ludwig Mies van der Rohe (1886-1969), appointed the third and last director, managed to quell the internal dissidence and revive the teaching programme. However, since architectural education served as the primary focus under his leadership, the workshops were no longer encouraged to accept any commercial commissions and Bauhaus products were made by independent manufacturers. Meyer's stringent functionalist premises were surpassed by Mies's own idiosyncratic design philosophy, which again celebrated architecture as an art form, but with a delicate balance struck between utilitarian factors and aesthetic considerations. His influence on the work of the Bauhaus students is unmistakable, but did not allow for much individual growth beyond his example.

Despite his impartiality, Mies bore the brunt of the political fury that had been haunting the Bauhaus since its inception. The municipal elections won by the National Socialists in 1931 sealed the school's fate and resulted in a temporary transferral to Berlin in August 1932 where it operated from a disfunctional telephone factory. Due to renewed political pressures, Mies and the remaining members of staff unanimously dissolved the world's most famous modern design institution on 19 July 1933.

Baroque (c. 1620-1715)

Pertains to the derivative of Classicism that dominated during the 17th century. It originated in Rome as an architectural celebration of the reassertion of Catholicism during the Counter-Reformation. The Baroque idiom – synonymous with theatrics, spectacle and flamboyance – aimed at eliciting an emotional and spiritual response from the audience. Although far more ornate than the preceding Renaissance and Mannerist styles, all aesthetic decisions still adhered to underlying systems of proportion and rules of symmetry. Baroque soon gained popularity, was adopted by numerous European countries and exported to their respective colonies, including South Africa.

Camera Obscura

Derived from the Italian for "dark room". The camera obscura refers to a box-like device or room constructed in such a way as to intercept rays of light as they pass through a small aperture, inverting the lit image onto a flat surface. Aristotle (384-322 B.C.) may have been familiar with these optical principles, and various descriptions are said to have been in circulation from the 10th century. During the 16th century, the aperture was replaced by polished glass lenses of varying thickness, and further modifications led to the use of mirrors that inverted the image. The camera obscura was the precursor of the modern camera and telescope. It is often said that it was artists' inability to portray nature accurately that stimulated its continual modification and extensive use, even by renowned Dutch artist Jan Vermeer (1632-1675). Instead of a recreation of nature, art had become a representation, which elicited much criticism.

Chiaroscuro

A pictorial technique, derived from the Italian for "light-shade", that explored tonal contrasts to dramatic effect.

Classicism

The Latin term "classicus" was presumably coined in 1599 to describe the literature and artefacts of Greek and Roman antiquity. The term has since taken on a host of, often ambiguous, meanings. The adjective "classic" (versus classical) is qualified by the *Oxford Dictionary* as "that which consists of a high quality that is recognised and unquestioned, or typical". Terms such as "simplicity", "harmonious", "elegance" and "discerning" are all derived from the distinctive aesthetic sensibility of Graeco-Roman origin.

Claude Glass

Invented by French landscape painter Claude Lorraine (1600-1682) during the 17th century, the Claude Glass aimed at enabling more accurate pictorial representation. It comprised a convex, tinted, glass surface mounted on a piece of wood in the shape of a hand mirror, which amplified the tonal values of the object under observation.

Conceptual Art (1960s+)

Conceptual Art refers to the autonomous movement in the visual arts that emerged during the 1960s in the USA and Europe with the exclusive objective of communicating the central idea that spawned the work's execution. The denotation "Conceptual Art" was evidently coined by American artist Edward Kienholz in the early 1960s. This particular art form is a documentary record of the thought processes of the artist, rather than of any aquired artistic skill, or customary formalistic tendencies synonymous with the visual arts. Apart from its obvious roots in Cubism, Conceptual Art is also an extension of the critical viewpoints of Marcel Duchamp (1887-1968) on the role and status of the arts. Conceptual Art still enjoys widespread currency and addresses a diverse range of topical issues. Art historians maintain that it is difficult to single out its major proponents but Lawrence Weiner (1940) and Douglas Huebler (1924) are most frequently cited.

Dada (1916-1922)

The denotation "Dada" (French for hobby horse) is said to have been randomly selected from a German-French dictionary in 1916 to denote an assembly of refugee artists, writers and poets who were stranded in Zurich during the First World War. Deeply impressed by the antics of the Futurists – although ideological adversaries – the Dadaists were ardently opposed to the ravages of war. They were also anti-establishment, anti-materialism and nihilistic. Dada embodied more of a state of mind than a specific set of artistic aims, except for legendary 'happenings' that communicated their rebellious points of view. It was a short-lived movement since the assembly dispersed at end of the war. Notwithstanding, dada gestures continued throughout Europe for some time, and were more coherently synthesized by the surrealist movement. In keeping with their aims, formulated by Romanian poet Tristan Tzara in the "Dada Manifesto" of 1918, their 'anti-art' emphasized concepts such as automation, chance, incoherence, transience and impermanence. Duchamp, Francis Picabia (1879-1953), Hans (Jean) Arp (1886/7-1966) and his wife, Sophie Täuber-Arp (1889-1943), were all committed Dadaists at some point in their careers.

Deconstructivism (Deconstruction, c. 1980+)

The so-called deconstructivist phenomenon in architecture is ascribed to the reappraisal of the formal, spatial and structural premises of Constructivism, coupled with the post-structuralist theories of contemporary French philosopher Jacques Derrida (in circulation since 1967). Deconstructivism achieved public recognition with the hosting of an exhibition of that name at the Museum of Modern Art (MoMA), New York, from 23 June until 30 August 1988, organized by Philip Johnson and Mark Wigley. Later that year, an international symposium, entitled "Deconstruction", was hosted in London by the Tate Gallery and the Academy Publishing Group.

The architects invited to exhibit their work at MoMA included Peter Eisenman, Frank Gehry, Daniel Libeskind, Zaha Hadid, Rem Koolhaas, Bernard Tschumi and the Austrian design enterprise, Coop Himmelblau. These architects shared no collective aim or agenda other than having arrived independently at a formal and spatial resolution that closely resembled the architectural investigations of the Soviet avant-garde of the 1920s.

Gehry's fascination with the Soviet avant-garde culminated in his reconstruction of the renowned "0-10 Exhibition" of 1915 for the Los Angeles County Museum of Art in 1980. Koolhaas' interest in the work of Ivan Leonidov (1902-1959) prompted a visit to Moscow during the late 1970s. He evidently passed on his enthusiasm to his colleague Tschumi and student Hadid at the Architectural Association in London. Tschumi's winning submission for the Parc de la Vilette, Paris, 1982, served as the first public homage to the creative exuberance of the Constructivists. The work of Coop Himmelblau and Libeskind are the least self-consciously derived from the Soviet precedent. Instead, they employ architecture as the medium with which to comment on the uncertainties of prevailing circumstances.

Derrida's influence remains contentious as only Eisenman and Tschumi are said to have been familiar with his philosophies before the 1988 exhibition. Notwithstanding, Derrida's questioning of the logocentricism of philosophy and linguistics coincides with the Deconstructivists' exploitation of formal and structural conventions, subsequently adopted as the intellectual justification for this particular mode of architectural expression.

Coop Himmelblau (1984: 91) provides the following commentary:

> "We are tired of seeing Palladio and other historical masks ... We want architecture to have more. Architecture that bleeds, that exhausts, that whirls and even breaks. Architecture should be cavernous, fiery, smooth, hard, angular, brutal, round, delicate, colourful, obscene, voluptuous, dreaming, alluring, repelling, wet, dry and throbbing. Alive or dead. Cold – then cold as a block of ice. Hot – then as hot as a blazing wing."

As a result of this novel design idiom, the following concepts and terms were added to the semantics of architecture: "disruption", "dislocation", "dismantling", "violation", "irritation", "imperfection", "strange yet familiar", even "the shock of the old".

Deutsche Werkbund (1907-1927+)

The inception of both the Deutsche Werkbund and the Bauhaus can be traced to the German architect, Gottfried Semper (1803-1879), who wrote his seminal essay *Wissenschaft, Industrie und Kunst* (Science, Industry and Art) in 1852 in response to the "Great Exhibition", hosted at the Crystal Palace, London, the year before. Semper's sober assessment of impact of industrialization on the applied arts and architecture, and his call for drastic improvements in German design, instigated the cultural debate that preoccupied Germany for numerous decades. German industry only started heeding these criticisms during the 1890s when even politicians realized that an improved standard of design was imperative for economic prosperity. In recognition, architect and theorist Hermann Muthesius (1961-1927) was sent in 1896 on an official mission to England – the world's leading industrial nation at the time – to study its successes. Upon his return to Germany in 1904, Muthesius was assigned to implement reform programmes in art and craft education, which he initially modelled on the British Arts and Crafts Movement. He deviated increasingly from their anti-machine stance, advocating mass production and chastising conservative groups that adopted a protectionist stance.

To further these objectives, a design institution, the Deutsche Werkbund, was found in 1907. Initial membership included, besides Muthesius, Peter Behrens (1968-1940), Viennese Secessionists Josef Hoffman (1870-1956) and Joseph Olbrich (1867-1908). Later members included Henri van der Velde (1863-1957), Bruno Taut (1880-1938), Walter Gropius (1883-1969) and Ludwig Mies van der Rohe (1886-1969). Although aimed at the synthesis of arts, crafts and industry, the Werkbund lacked a coherent design approach and was soon haunted by disparity amongst its diverse membership. While Muthesius was committed to a normative and typological approach in all fields of design, Van der Velde and Behrens, even Gropius, claimed sovereignty of individualized expression. A debate between "norm" versus "form", and "type" versus "individuality", preoccupied the members for some time. These differences of opinion were evident at the heterogeneous "Cologne Werkbund Exhibition" of 1914 which ranged from buildings excecuted in a neo-classical idiom, to Taut's renowned Glass Pavilion and Van der Velde's Art Nouveau design for the Werkbund Theatre. It was only after the First World War that a more coherent design ideology evolved with an increasing bias towards functionalist aims. Although the Werkbund activities did not cease until the mid-1930s, the initiation of the Bauhaus and the Weissenhofsiedlung can be considered its principal accomplishments.

Expressionism (1910-1925)

Expressionism is a problematic denotation since there has never been a cohesive art or architectural movement of that name. Yet, with time, Expressionism became synonymous with the display of creative energy, individuality and poetic formalism that was pertinent to Germany between the two world wars.

From an artistic point of view, Expressionism pertains to the two informal initiatives, Die Brücke (The Bridge, 1905-1913), concentrated initially in Dresden and subsequently in Berlin, and Der Blaue Reiter (The Blue Rider, 1910-1914), founded in Munich. Initially, the artists from Die Brücke had no specific pictorial intention other than assembling a group of individuals who shared an enthusiasm for the aesthetic revolution that had emerged in France. The association included a number of young architectural students, namely, Ernst Ludwig Kirchner (1880-1938), Erich Heckel (1883-1970), Karl Schmidt-Rottluff (1884-1976) and Fritz Bleyl (q.v.). They were briefly joined by Emil Nolde (1867-1956), Max Pechstein (1881-1955) and Otto Müller (1874-1930), in addition to Lyonel Feininger (1871-1956) and Oskar Kokoschka (1886-1980). This informal group was decisively influenced by the Post-Impressionists and the Norwegian artist Edvard Munch (1863-1944). Their output was varied and stylistically incoherent, save for the bold use of colour and the distortion of form after the example of the Fauves and Cubists that was dominant in later years. Amidst the prevailing socio-economical insecurities of the early 1910s, the content of their paintings became increasing introspective and political, which gave rise to public outrage. Die Brücke came to an abrupt end in 1913.

Der Blaue Reiter – named after a painting by Vasily Kandinsky (1866-1944) – comprised an impromptu assembly of artists who participated in two exhibitions hosted in Munich in December 1911 and February 1912. Participants included, apart from the organizers, Kandinsky and Franz Marc (1880-1918), Paul Klee (1879-1940), Alexei von Javlensky (1864-1941), August Macke (1887-1914), Gabriele Münter (q.v.) and Marianne von Werefkin (q.v.). Their work was even more varied than that of the Brücke artists, ranging from Kandinsky's abstract compositions to Marc's lyrical animal studies. Despite their contradictory pictorial persuasions, these artists were ardently committed to metaphysical premises, as evidenced in Kandinsky's *On the Spiritual in Art*, published in 1912. Following the death of Marc and Macke during the First World War, their collective creative energy became dissipated.

The architectural component of Expressionism was philosophically, rather than methodologically or formally, aligned with these two painterly initiatives. German architects Bruno Taut (1880-1938), Erich Mendelsohn (1887-1953), Hans Poelzig (1869-1936), Hugo Häring (1882-1958) and Hans Scharoun (1893-1972) are regarded as the major proponents of an architectural Expressionism due to the idiosyncratic, often organic, and even sensual appearance of their respective buildings. The work of Dutch architects Michel de Klerk (1884-1923) and Pieter Kramer (1881-1961) is also often cited in this regard, even though their design inspiration was derived from the local vernacular rather than from any painterly example.

Of the above-mentioned architects, Taut was most committed to an expressionist agenda. He propagated a crystallized, glass architecture that inspired the visionary skyscraper projects of Ludwig Mies van der Rohe (1886-1969) of the early 1920s. Taut initiated a number of activities, including, "An Exhibition for Unknown Architects" in 1919 where visionary designs by himself and Mendelsohn, amongst others, were on display; the publication of the journal *Frülicht* in 1920; and the network of so-called Utopian Correspondents, entitled Die Gläserne Kette, with Walter Gropius (1883-1969) and Scharoun amongst the participants. The solidarity of the Glass Chain soon disintegrated when it was realized that poetic form failed to meet the demands of rapid industrialization. Largely as a result of his appointment as city architect of Magdeburg and various commissions for low-cost housing projects, Taut, too, had to acknowledge to the difficulties in reconciling the emotive properties of evocative form with economic viability. Following the design of the Einstein Observatory, Potsdam (1921) – the epitome of Expressionism – Mendelsohn also started to reconsider the somewhat arbitrary poetic license. Only Häring and Scharoun persisted in their expressionist pursuit, but they came into conflict with the members of CIAM – Le Corbusier, in particular. The adoption of primary geometric form as the quintessence of modern architecture at the 1928 CIAM convention, hosted at La Sarraz in Switzerland, marginalized all expressionist explorations until the 1950s.

Golden Section

The only proportion that consists of two magnitudes instead of three of four. The ratio of the larger to the smaller numerical values always approximates 0,618; the ratio of the smaller to the larger approximates 1, 618 (= *phi*); and the ratio of the smaller to the larger numerical values always equals that of the larger to the whole – algebraically qualified as a : b = b : a + b or a / b = b / a + b. In the 13th century, one Leonardo da Pisa discovered that the Golden Section could be ascribed to an infinite sequel of numbers, termed the Fibonacci Series: 1, 2, 3, 5, 8, 13, 21 ... , and algebraically determined by the sum of the aforegoing numerical values: 1 + 1 = 2, 2 + 3 = 5, 5 + 3 = 8, 8 +5 = 13, ...

Illumination

The term, derived from the French word *enluminer* (to brighten), refers to the medieval technique of embellishing text and decorating hand-written manuscripts.

Immeubles-Villas (1922) – Le Corbusier

The so-called apartment villas developed by Charles-Èduard Jeanneret / Le Corbusier (1887-1965) for high-density, urban living as proposed in Une Ville Contemporaine. The spatial organization of the assembled duplexes was based on the Citrohan prototype, though altered to an L-shaped plan configuration to accommodate individual, double volume garden terraces. The concept was derived from the Carthusian Monastery, Ema, Italy, which Le Corbusier had visited on his study travels and considered the ideal model to achieve individual freedom within a collective organization. Accordingly, domestic amenities and an enclosed courtyard garden, equipped with recreational facilities, were provided for communal use.

Kinetic Art (c. 1958-1970s)

Kinetic Art dominated the international art scene during the late 1950s and the 1960s. It was intrinsically a three-dimensional art form that was concerned exclusively with movement. Its origins can be traced to the Cubists' preoccupation with simultaneity, the Futurists' celebration of speed and acceleration, and the constructivist sculptures by Vladimir Tatlin (1885-1953), Naum Gabo (1890-1977), and their disciples. The Hungarian artist and photographer associated with the Bauhaus, László Moholy-Nagy (1895-1946), was also interested in kinetics, which he explored through the medium of light. The mobiles invented by American artist Alexander Calder (1898-q.v.), with their reliance on the movement of air (instead of locomotion generated by electricity), contributed substantially to the establishment of kinetics as an autonomous art form, culminating in the "Lumière et Mouvement Exhibition", hosted in Paris in 1967. In contrast with Op Art, Kinetic Art involves movement in space – either of the work itself or of the spectator – and results in some optical transformation of the constituent elements. In addition to Calder, the major exponent of Kinetic Art, other practitioners included Kenneth Martin (1905-1984), Pol Bury (1922) and George Rickey (q.v.).

Mannerism (c. 1520-1620)
Derived from the Italian word *maniera* and first used by the renowned Renaissance biographer on art, Giorgio Vasari (1511-1574). Mannerism refers the expansion of the classical design idiom through subtle proportional and optical adjustments, and the incorporation of the ellipse to its geometrical repertoire. The inception of Mannerism coincided with a period of tremendous political unrest in Italy, particularly in Rome, which was overrun by imperial troops in 1527. The resulting sense of insecurity is said to have been the principal cause of the mannerist design approach to Renaissance architecture.

Maison Citrohan (1920, 1921+) – Le Corbusier
The free-standing, flat roofed housing prototype developed by based on the Dom-ino structure that served as the generic precedent for the majority of Le Corbusier's purist villas of the 1920s. The first version consisted of three stories. The second adaptation totalled four, due to the inclusion of a garage and servants' quarter on the ground floor, and the partially raising of the upper levels on pilotis. The internal planning was organized around a double height salon, coupled with two alternate levels for sleeping and accessed via two separate sets of stairs. The upper bedrooms opened onto an enclosed roof garden.

Maison Dom-ino (1915) – Le Corbusier
Le Corbusier's first demonstration of the application of the Dom-ino structural system. The title in the singular is misleading since it comprises a double-storey apartment complex. It not the structural prototype, as is often assumed.

Maison Monol (1919) – Le Corbusier
The vaulted single- or double-storey housing prototype based on the Dom-ino structure which Le Corbusier developed with engineer Max du Bois (1884-1976). Although intended for construction *en masse*, it served as the generic precedent for Le Corbusier's load-bearing regionalist villas dating from 1935 onwards.

Minimalism (c. 1959-1970s)
Minimalism – an obvious extension of Suprematism – emerged in the USA during the late 1950s. However, the Minimalists were considerably less concerned with the cosmological theories that Kazimir Malevich (1878-1935) ascribed to supreme man-made form, than with the mere existence of the artefact itself. Coinciding with Malevich's anti-naturalistic stance, the minimalist sculptors, in particular, worked predominantly in industrially-produced materials. The movement materialized partly as a reaction to the subjectivity and allusive emotionalism of Abstract Expression and was consequently not concerned with any form of self-expression. The Minimalists exploited and maximized immediacy, and were committed to clarity, conceptual rigour and, above all, geometric simplicity devoid of any metaphorical meaning. Minimalism celebrated the resplendence of the object, attempted to aestheticize modern technology, and relished in the so-called state of non-depiction and neutrality. Although the subject matter does not appear to signify anything, its existence legitimizes its credibility. This coincides with the legendary statement by Marcel Duchamp (1887-1968) that it is art because he said so. Leading practitioners included the minimalist painters, Ad Reinhardt (1913-1967) and Frank Stella (1936), and minimalist sculptors such as Dan Flavin (q.v.) and Don Judd (q.v.).

Modern
The general association of the term "modern" pertains to the contemporaneous or contemporary, and also to that which is considered new or novel. Affiliation with the present has always been pertinent to the understanding of the concept. Vitruvius (c. 90-20 B.C.) wrote about the antics of 'the ancients' in his famous architectural treatise *The Ten Books on Architecture*. The Latin *modernus* was first used during the 5th century (A.D.) to distinguish the Christian epoch from its pagan past. Ever since, the term has been associated with the consciousness of an epoch and a distinction between old and new, past and present. As a result of the dramatic changes that resulted from the Industrial Revolution, the term acquired an unsavoury connotation that persisted until the late 19th century. Only since the beginning of the 20th century has the term been associated with improvement, efficiency and progress – a perceptual change to which architecture contributed substantially.

The stylistic association of the term stems from the article "Art Moderne in La Revue Moderniste" (1881), written by an art critic, one Joris-Karl Huysman, in defence of Impressionism and the deviation from traditional pictorial conventions. The term acquired popular currency and was adopted in the architectural arena to describe the anti-historical attitude that countered previous conceptual intentions. Since the recent acceptance of the denotation "Post-Modern" – popularized by Charles Jencks after the article by one Joseph Hadnut entitled "The Post-Modern House" (1949) – the stylistic distinction between Modernism and subsequent architectural developments has become more pronounced.

Modulor

The system of measurement developed by Le Corbusier with its proportional increments, though corresponding to the Golden Section, applied to the human physique averaged at 1 830 mm. Although the Greek Orders can be regarded as the first modular system applied to the design of buildings, the ancient Greeks were concerned with proportion and not with measurement *per se*. By contrast, Le Corbusier synthesized a system of proportion with a system of measurement, identifying a range of dimensions – based on a modification of the Fibonacci Series – that could standardize the building industry. The Unité d'Habitation, Marseilles (1948), was the first project in which every design decision and corresponding dimension of the building had been determined by the Modulor.

Monument to the Third International (1920) – Tatlin

The proposal by Russian artist Vladimir Tatlin (1885-1953) for the structure that celebrated the second year of the Russian Revolution. The monument was intended to be 400 metres high – higher than both the Eiffel Tower and Empire State Building. Tatlin's proposal consisted of a steel and glass cube, pyramid and cylinder that each suspended inside a slanted, double-helix lattice work that was to straddle the Neva River in Petrograd. At the bottom, the cube, housing offices and conference facilities for the legislative council, would rotate once a month; the pyramid, housing the executive council, would rotate once a week; and the daily rotating domed cylinder would serve as an information centre for broadcasting propaganda to the world, even for projecting slogans onto the clouds. It is not quite clear how the vertical circulation was intended to work and whether these geometric components were connected in any way. Notwithstanding, the Monument to the Third International served as the quintessential expression of the infant socialist state and its general infatuation with the industrial era.

Mundaneum (1929) – Le Corbusier

A proposal made by Le Corbusier for the League of Nations in Genève, comprising of an assortment of cultural facilities, including a so-called Musée Mondial. Le Corbusier's design for the museum consisted of a stepped pyramid with an exploration route through the different exhibition spaces. Save for the use of primary form, it was a significant deviation from his usual design repertoire and imbued with symbolical content. Although highly impractical and severely criticized, Le Corbusier's series of built museums in Ahmedabad (1956), Tokyo, (1957), Zurich (1967) and Chandigarh (1970) were all modelled on the same *parti* of movement.

Neue Sachlichkeit (New Objectivity, 1923-1933)

The Neue Sachlichkeit refers to the non-Soviet architectural movement founded solely on functionalist and socialist premises, prevalent in Switzerland, Germany, Czechoslovakia and the Netherlands between the two world wars. The origin of the term is contentious and can be traced the early writings of German architect and theorist Hermann Muthesius (1861-1927), who frequently used the word to call on a reforming attitude necessary for industrial production. One G. F. Hartlaub claimed to have coined the phrase in 1924 to describe a new direction in German painting that emerged in opposition to Expressionism. It was subsequently adopted to denote the architectural movement that embraced the Marxist ethos of production, and opposed all forms of non-utlitarian design expression.

The movements' impetus was derived from Lazar (El) Lissitzky (1890-1941) who had been propagating the ideas of the Soviet avant-garde through exhibitions and the written word since 1921 – first in Berlin and then in Basel. He soon acquired a following and founded the ABC Group in 1925 in Switzerland together with Dutch architect Mart Stam (1899-q.v.) and Swiss architects Hannes Meyer (1889-1954, who later headed the Bauhaus) Emil Roth (1903-q.v.), Hans Schmidt (1893-1872) and Hans Wittwer (q.v.). Their aims were communicated in their journal *ABC: Beiträge zum Bauen*, which called for a socially responsible architecture that was determined exclusively by scientific and emperical processes. Lissitzky's former interest in the elemental formal language of Suprematism had by this time been surpassed conclusively by utilitarian preoccupations, and a fascination with light-weight materials, standardization and prefabrication.

The group's equation of social responsibility with technical performance remains questionable, also the attention given to an unmistakeable machine aesthetic – which supposedly symbolized 'nothing' other than utilitarian considerations. Their performance can best be judged from the competition submission for the League of Nations Building for Geneva (1927) by Meyer and Wittwer, and the Van Nelle Tobacco Factory, Rotterdam (1929), by Stam. The latter building is considered the apogee of the Sachliche approach, although its massing and formal resolution owed much to Constructivism and Suprematism. This building generated considerable enthusiasm, even from Le Corbusier who, on the authority of Frampton (1980: 134-135) wrote in 1931 that "The Van Nelle tobacco factory in Rotterdam, a creation of the modern age, has removed all the former connotations of despair from the word 'proletarian' ... lead[ing] to most happy result; the phenomenon of personal participation [*sic*] in every stage of the human enterprise." However, the adherents of Neue Sachlichkeit were less favourably inclined towards Le Corbusier's work and severely criticized his unwavering commitment to aesthetic considerations – criticisms also levelled at Ludwig Mies van der Rohe (1886-1969, the De Stijl architects, and Bauhaus curriculum. The Sachliche attitude was particularly persuasive in the abandonment

of all formal and spatial resolution derived from modern art since they favoured a supposedly objective and rational approach to design.

The New York Five (1962+)

The denotation "The New York Five" – presumably coined by architectural critic Alan Colquhoun in 1976 – applies to the American architects, Richard Meier, Michael Graves, John Hejduk, Peter Eisenman and Charles Gwathmey, who won international acclaim after the publication of an anthology of their domestic projects in 1972. Rosemarie Bletter's celebrated compendium *Five Architects* drew attention to their similarity in design approach and the manner in which they furthered the semantic potential of the International Style. However, unlike the pioneering Modernists, these architects' efforts were derived exclusively from formal and spatial investigations with no socio-political agenda in mind; sustained, in their instance, by the sound economic infrastructure of the USA and academic tenure.

However varied their interpretations, Le Corbusier's Dom-ino structure, Purism, Neo-Plasticism and work of the Italian Modernists – Guiseppe Terragni (1904-1943), in particular – served as principal sources of reference. Academic Colin Rowe is cited as the major intellectual impetus for the Five's interest in the International Style, based on his pertinent analyzes of Le Corbusier's purist architecture. During the late 1960s and 1970s, the Institute for Architecture and Urban Studies, New York, served as the forum for their theoretical discourse.

Meier's work most closely resembles Le Corbusier's purist villas of the 1920s. Graves' early work was an expansion of purist principles, whereas Hejduk and Eisenman furthered the aesthetic tenets of De Stijl. Gwathmey, perhaps the most pragmatic of the Five, pursued a puritanical formalism but with the proportions derived from Le Corbusier's Modulor. Generally-speaking, the work of the New York Five is characterized by a spatial and plastic dynamicism, a geometric complexity and a technical finesse that far exceeds the efforts of their predecessors.

More recently and subsequent to international recognition, their initial domestic repertoire has been surpassed by civic and commercial commissions, which Meier pursues most rigorously. Gwathmey established a partnership with Robert Siegel in 1971 and continues to meet the demands of a commercially viable practice. Eisenman's interest in Derridean philosophy since the 1970s, has led to his anti-functional, 'deconstructive' approach, which he, too, has been able to realize on a larger scale – both in the USA and abroad. Of the Five, Hejduk's work remains the most conceptual. Since the 1980s, Graves has directed his attention to a somewhat brash eclecticism. As he has always been more interested in the metaphorical properties of the abstract vocabulary of Heroic Modernism than any of his colleagues, his 'defection' to Post-Modernism is perhaps less radical than is generally assumed.

Op Art (c. 1964-1970s)

Although an autonomous art movement, Op Art is closely associated with Kinetic Art. It differs in so far as it explores the creation of an illusionary sense of movement through the static medium of painting. The term, derived from "optics", has been in general use since 1964 when it appeared in print in *Time*. Art historians trace the origins of Op Art to the colour techniques developed by the Impressionists and, particularly, Seurat. Its emergence is also anticipated in the some of the work of the Vorticists. Op Art was particularly influential in the decorative and applied arts of the 1960s, appealing also to popular artistic sensibilities. Leading practitioners of Op Art included Yaacov Agam (1928) and Victor Vasarély (1908-q.v.).

Performance Art (1960+)

This particular art form, an extension of Conceptual Art, entails acts of immediacy and impermanence, usually presented in front of a live audience. Conceptual intent is physically communicated, with the human body serving as artistic medium. Performance Art tends to produce startling effects and relies heavily on the response and participation of the spectators. The legendary antics of the British duo, Gilbert and George, are synonymous with this particular art form. Both Conceptual Art and Performance Art are said to have reached its zenith towards the end of the 1970s in the face of the revival of the pictorial arts that coincided with so-called post-modern premises. However, the fact that The School of the Art Institute in Chicago offers academic instruction in Performance Art bears testimony to its prevailing disciplinary status.

Plan Voisin (1922) – Le Corbusier

The contentious urban proposal for the renewal of Paris that derived its name from the automobile company, Voisin – the sponsor of Pavillon l'Esprit Nouveau and within which the project was first exhibited. Le Corbusier proposed the demolition of substantial parts of the centre of Paris and to be replaced with a series of office towers, surrounded by high density, luxury apartments. Its organization was identical to Une Ville Contemporaine except that certain historically significant buildings were incorporated into the larger development framework.

Pointillism (Divisionism)
Pertains to the unique painterly technique developed by Georges-Pierre Seurat (1859-1891), based on the scientific properties of colour. The combination of primary, secondary and complementary colours produces startling optical effects when viewed from a distance. Instead of relying on *chiaroscuro*, Seurat indicated that pictorial depth can be conveyed as effectively through the exclusive application and combination of colour. The term was evidently coined by a French art critic, one Félix Félon, in 1886 to describe the 'dot-like' manner in which the paint was applied to the canvas. In addition to Seurat, Paul Signac (1863-1935) and Camille Pissarro (1830-1903) also pursued this particular avenue of exploration, compelling some art historians to refer to their work as Neo-Impressionist.

Pop Art (1956-1970s)
Refers to the popular art movement that originated in England during the mid-1950s and dominated the art scene in the USA during the 1960s. The term was coined by an English art critic, one Lawrence Alloway, as early as 1954. However, the first example of Pop Art was produced only two years later by Richard Hamilton and bore the title, *Just What Is It That Makes Today's Homes So Different, So Appealing?* Pop Art is said to have materialized in opposition to the austerity of the post-war years and served as an intellectual – albeit humorous – commentary on commercialism, capitalism and the resultant consumer society. Although Pop Art shares certain similarities with Dada – Marcel Duchamp (1887-1968), in particular – it differs from Dadaism in so far as it was a considerably more positive movement that celebrated – rather than negated – the commonplace, the stereotypical and popular culture. By de-contextualizing mass-produced consumer items and popular symbols, Pop Artists succeeded in elevating their status to the realm of fine art. Pop Art exercised a considerable influence on post-modern architecture. Leading practitioners include Andy Warhol (1928-1987), Roy Lichtenstein (1923-1996), Claes Oldenburg (1929) and Jasper Johns (1930).

Rationalism
Pertains to the 17th-century philosophical train of thought, predominantly ascribed to by René Descartes (1591-1650), Benedict de Spinoza (1632-77) and Gottfried Leibniz (1646-1716). The Rationalists claimed that reason was the sole source of knowledge, and that knowledge of the universe could be acquired only through the application of systematic reasoning. From an architectural point of view, Rationalism pertains to a more logical design approach, derived from structural and utilitarian efficiencies instead of formal and aesthetic considerations.

Rayonism (1913)
Rayonism was one of the earliest modern art movements to emerge from Russia, initiated by Mikhail Larionov (1881-1964) in 1913. Although methodologically indebted to Cubism, Rayonism was closer aligned to the dynamic intentions of the Futurists, and the colour abstractions of Robert Delaunay (1885-1941). Larionov's initial landscape studies, which investigated the effect of sunlight, were soon surpassed by his abstract compositions consisting exclusively of rays of colour and light – hence the name. Other practitioners included Natalia Goncharova (1881-1962).

Rococo (c. 1715-1750)
The term was presumably derived from the French word *rocailleux* which literally translates as "pebbly" or "rough". Rococo refers to the classical derivative that emerged in France and Germany during the 18th century. Rococo was characterized by excessive ornamentation, gilded finishes, pastel colours and curvilinear shapes and forms. It also exercised considerable influence on all the related arts, including furniture and fashion design, and even hair styles. The association with opulence and frivolity, coupled the popularity that the style enjoyed with the French royal family, contributed to the political dissent that culminated in the French Revolution of 1789.

Surrealism (1922-1938)
An art movement closely associated with Dada which also substantially influenced literature, the dramatic arts and cinematography during the 1920s and 1930s. The Surrealists aimed at a visible expression of the subconscious with explicit sexual and Freudian overtones, and even promoted the use of drugs and hypnosis. They also attempted to liberate all forms of creative expression from overt contemplation, and aesthetic and moral preoccupations – views promulgated by French poet André Breton (1896-1966) in the "Surrealist Manifesto" published in 1924. The Surrealists lacked artistic coherence as considerable emphasis was placed on the act of spontaneous creation. These intentions found expression in the improvisations of found objects and collages produced by former Dadaists Marcel Duchamp (1887-1968) and Hans (Jean) Arp (1886/7-1966), Max Ernst (1891-1976), Joan Miró (1893-1983); the dream-like fantasies of Salvador Dali (1904-1989); and the bizarre juxtapositions of René Magritte (1898-1967). Even the art of the quintessential Cubist, Pablo Picasso (1881-1973), displayed surrealist inclinations from 1925. The movement culminated in the "International Exhibition of Surrealism" hosted in Paris in 1938. Although the concentrated energy dissipated after the Second World War, Surrealism found further expression in later aesthetic initiatives, such as Abstract Expressionism and Pop Art.

Synchronism (1913)
Refers to the pioneering American abstract art movement launched by Stantin MacDonald-Wright (1890-1973) and Morgan Russell (1886-1953) in October 1913. The name was chosen to denote the connection between music (symphony) and colour. Although the Synchronists claimed independence from Orphism, they were decisively influenced by the preceding colour abstractions of the Orphists Frantisek Kupka (1871-1957) and Robert Delaunay (1885-1941). The principal contribution of Synchronism was the introduction of abstract art to the USA.

Theosophy
A philosophical-*cum*-spiritual movement founded by Helen ('Madame') Blavatsky (1831-q.v.) and one Henry Steel Olcott in 1875 in New York in reaction against the hedonism of the materialistic age. Theosophy was modelled on Eastern religious practices and encouraged meditation and introspection. It also emphasized the visual aspects of the spiritual, promoting so-called thought forms, and the mystical properties of colour and geometric configurations. Theosophy excercized a profound influence on the emergence of Neo-Plasticism, the abstract Expressionism practised by Vasily Kandinsky (1866-1944), and Suprematism.

Trompe l'Oeil
The French phrase for "deceiving the eye". Usually used with reference to a mural that exploits perspective and illusionary depth so that it appears entirely three-dimensional and tactile. *Trompe l'oeil* was used extensively during the Baroque and Rococo periods.

Vorticism (1912-1915)
Refers to the pioneering graphic art movement that materialized in England before the First World War. Vorticism was a synthesis of the geometric abstractions of Cubism and the dynamics explored by the Futurists. The movement was dominated by the personality of Wyndham Lewis (1882-1957), editor of its mouthpiece *BLAST*, of which only two editions appeared in 1914 and 1915. Other members included William Roberts, Edward Wadsworth, Frederick Etchells and David Bomberg . The Vorticists were also influenced by aerial photography and modern engineering. The aspect that sets Vorticism apart from other modern art movements was the unique treatment of form that accelerated towards a *vortex* – hence the name as coined by art critic, Ezra Pound. Mitchell, who directed his attention to architecture after the war, not only translated *Vers une Architecture* by Le Corbusier into English, but also designed the first modern office complex in London. Bomberg's compositions, in particular, anticipated the development of Op Art.

Weissenhofsiedlung, Stuttgart (1925-1927)
This international architectural exposition, hosted by the Deutsche Werkbund, provided a forum for renowned architects to expose the public to ideal modern living. The curator of the exhibition, Ludwig Mies van der Rohe (1886-1969), selected the participants, which included Peter Behrens (1868-1940), Walter Gropius (1883-1969), Jocobus Johannes Pieter Oud (1990-1963), Mart Stam (1899-q.v.), Victor Bourgeois (q.v.), Bruno Taut (1880-1938), Hans Poelzig (1869-1936) and Charles-Èduard Jeanneret / Le Corbusier (1887-1965). The formal similarities of the collection of buildings prompted Alfred Barr Jr (1902-1981) to coin the term "International Style". It was also on this occasion that Le Corbusier started to make reference to his "5 Points d'une Architecture Nouvelle". Le Corbusier's contribution consisted of two different housing prototypes, though based on the same design principles – a free-standing, four-storied, single family house and a double-storied semi-detached unit accommodating two families of varying size.

LIST OF ILLUSTRATIONS

CHAPTER 2 THE CLASSICAL IDEAL OF BEAUTY

2.1 From Doczi, G., 1981, *Power of Limits – Proportional Harmonies in Nature, Art and Architecture* (Boulder, Colo.: Shambala), 10.
2.2 *Ibid.* (9).
2.3 *Ibid.* (11, 97).
2.4 *Ibid.* (108).
2.5 *Ibid.* (41).
2.6 *Ibid.* (40).
2.7 Unspecified reproduction. From Cameron and Spies (eds.), 1986, *Nuwe Geskiedenis van Suid-Afrika in Woord en Beeld* (Cape Town: Human & Rousseau), 35.
2.8 Fresco (81 cm); British Museum, London. From Beckett, Sister W., 1994, *The Story of Painting – The Essential Guide to the History of Western Art* (London: Dorling), 13.
2.9 Marble (n. dim.); location unspecified. From Lloyd-Jones, H. (ed.), 1965, *The Greek World* (Eng.: Penguin), fig. 4.
2.10 From Doczi (1981: 104).
2.11 Fresco (n. dim.); Fratelli Fabbri, Milan. From Beckett (1994: 19).
2.12 Fresco (21 cm); Archeological Museum, Naples. *Ibid.*(21).
2.13 From Vitruvius, 1914 ed.; 1960, *Ten Books on Architecture*, trans. Etchell, F. (New York: Dover), 85, 91.
2.14 From Doczi (1981:112).
2.15 From Fletcher, Sir B., 1945, 12th ed., *A History of Architecture on the Comparative Method*, (London: Batsford), 556.
2.16 *Ibid.* (609).
2.17 *Ibid.* (628).
2.18 *Ibid.* (661).
2.19 Oil on canvas (314 x 205 cm); Uffizi, Florence. From Beckett (1994: 94-95).
2.20 Oil on canvas (772 cm); Stanze di Raffaello, Viticano. *Ibid.* (128).
2.21 Oil on canvas (77 x 53 cm); Louvre, Paris. *Ibid.* (117).
2.22 Fresco (detail); Sistine Chapel ceiling, St Peters, Rome. *Ibid.* (21).
2.23 Oil on canvas (207 x 210 cm); National Gallery, London. *Ibid.* (160-161).
2.24 Unspecified reproduction. From Doczi (1981: 95).

CHAPTER 3 THE COGNO-PERCEPTION OF SPACE

3.1 Mosaic (n. dim.); Museo Nazionale, Naples. From Beckett, Sister W., 1994, *The Story of Painting – The Essential Guide to the History of Western Art* (London: Dorling), 19.
3.2 Fresco (40 x 27 cm); Catacombe di Priscilla, Rome, Italy. *Ibid.* (24).
3.3 Detail of Bayeaux tapestry; Bridgeman Art Library, Eng. *Ibid.* (33).
3.4 Unspecified reproduction. From Frayling and Van der Meer, 1992, *The Art Pack: Three Dimensional Tour through the Creation of Art* (New York: Knopf), "Perspective", n. pag.
3.5 Oil on canvas (48 x 35 cm.); National Gallery of Art, Washington DC. From Beckett (1994: 59).
3.6 Oil on canvas (30 x 39 cm); Ashmolean, Oxford. *Ibid.* (87).
3.7 Bronze (no dim.); location unspecified. *Ibid.* (83.)
3.8 Fresco (205 x 90 cm); Uffizi, Florence. *Ibid.*
3.9 Fresco (670 x 315 cm); location unspecified. *Ibid.*(85).
3.10 From Gavin Macrae-Gibson, 1985, *The Secret Life of Buildings: An American Anthology of Modern Architecture* (Cambridge, Mass.: MIT Press), 41.

3.11 Unspecified reproduction. From Gavin Macrae-Gibson (1985: 42).
3.12 Engraving; part of the series "Optique de Portraiture et Peinture" (1670). From Varnedoe, K., 1990, *A Fine Disregard – What Makes Modern Art Modern?* (London: Thames & Hudson), 37.
3.13 Unspecified reproduction. From Macrae-Gibson (1985: 42).
3.14 Engraving; "De Bibiena", 1711, *Architttura Civile*. *Ibid.* (44).
3.15 Engraving; British Architectural Library, London. *Ibid.* (45).

CHAPTER 4 THE MECHANIZATION OF VISION

4.1 Oil on canvas (391 x 496 cm); Girandon, Paris. From Beckett, Sister W., 1994, *The Story of Painting – The Essential Guide to the History of Western Art* (London: Dorling), 261.
4.2 Oil on canvas (160 x 92 cm); Victoria and Alfred, London. *Ibid.* (278)
4.3 Oil on canvas (335 x 427 cm); Louvre, Paris. *Ibid.* (253).
4.4 Unspecified reproduction. From Copplestone, T., 1969, *Architecture – The Great Art of Building* (London: Deans), 80.
4.5 Ledoux, *Architecture Considerée* (n.d.). From Macrae-Gibson, G., 1985, *The Secret Life of Buildings – An American Anthology of Modern Architecture* (Cambridge, Mass.: MIT Press), 47.
4.6 From Copplestone (1969: 82).
4.7 *Ibid.* (80).
4.8 Oil on canvas (160 x 250 cm); Musée d'Orsay, Paris. From Anon, 1986, *Paintings in the Musée d'Orsay* (Paris: Scala), 46.
4.9 Oil on canvas (130 x 150 cm); Musée Fabre, Montpellier. From Beckett (1994: 283).
4.10 Oil on canvas (208 x 264 cm); Musée d'Orsay, Paris. From Anon (1986: 58).
4.11 Oil on canvas (1814 x 163 cm); Louvre, Paris. From Beckett (1994: 256).
4.12 Oil on canvas (130 x 190 cm); Musée d'Orsay, Paris. From Anon (1986: 59).
4.13 Oil on canvas (1190 x 1650 cm); Uffizi, Florence. From Berti, L., 1971, *The Uffizi – All Paintings Exhibited in 657 Illustrations* (Firenze: Becocci), 92.
4.14 Oil on canvas (130 x 175 cm); Phillips Collection, Washington DC. From Beckett (1994: 298.)
4.15 Pastel on paper (82 x 50 cm); National Gallery of Art, Washington DC. *Ibid.* (293).
4.16 Oil on canvas (32 x 39 in.); Fogg Art Museum, Harvard Univ., Cambridge, Mass. From Russell, J., 1991, *The Meanings of Modern Art* (London: Thames & Hudson), 20.
4.17 Pastel and distemper on paper (20 7/8 x 16 1/8 in.); Fogg Art Museum, Harvard Univ., Cambridge, Mass. *Ibid.* (21).
4.18 Oil on canvas (39 x 49 cm); National Gallery, London. From Beckett (1994: 314).
4.19 Oil on canvas (90 x 92 cm); National Gallery, London. *Ibid.* (296).
4.20 Oil on canvas (19 1/8 x 23 1/2 in.); Kunsthaus, Zurich. From Brion, M., 1974, *Cézanne* (London: Thames & Hudson), 64.
4.21 Oil on canvas (7 1/8 x 15 in.); private collection. *Ibid.* (45).
4.22 Oil on canvas (21 x 25 in.); location unspecified. From Wallace, R., 1971, *The World of Van Gogh – 1853-1890* (Neth.: Time-Life), 46.
4.23 Oil on canvas (20 x 17 3/4 in.); location unspecified. *Ibid.* (169).
4.24 Oil on canvas (44 3/4 x 34 1/4 in.); location unspecified. *Ibid.* (116).
4.25 Oil on canvas (37 x 28 1/2 in.); location unspecified. *Ibid.* (129).
4.26 Wood-block print from the series "One Hundred Views of Edo" (13 1/4 x 8 5/8 in.); Brooklyn Museum, New York. From Varnedoe, K., 1990, *The Meanings of Modern Art – What Makes Modern Art Modern?* (London: Thames & Hudson), 59.

4.27 Oil on canvas (21 5/8 x 18 1/8 in.); National Museum Vincent van Gogh, Amsterdam. *Ibid.* (58)

4.28 Wood-block print from the series "One Hundred Views of Edo" (13 1/4 x 8 5/8 in.); Brooklyn Museum, New York. *Ibid.* (55).

4.29 Oil on canvas (26 x 31 7/8 in.); Musée d'Orsay, Paris. *Ibid.* (54).

4.30 Oil on canvas (4 ft 7 1/2 x 12 ft 4 1/4 in.); location unspecified. From Wallace (1971: 134-145).

CHAPTER 5 CUBISM

5.1 Oil on canvas (40.5 x 32.5 cm); Royal Museum of Fine Arts, Copenhagen. From Beckett, Sister W., 1994, *The Story of Painting – The Essential Guide to the History of Western Art* (London: Dorling), 336.

5.2 Oil on canvas (21 1/2 x 25 1/2 in.); Minneapolis Institute of Arts, Minnesota. From Russell, J., *The Meanings of Modern Art* (London: Thames), 45.

5.3 Oil on canvas (80 x 100 cm); Musée d'Orsay, Paris. From Anon, 1986, *Painting in the Musée d'Orsay* (Paris: Scala), 155.

5.4 Oil on canvas; National Gallery of Art, Washington DC. From Beckett (1994: 335).

5.5 Unspecified reproduction. From Cameron and Spies (eds.), 1986, *Nuwe Geskiedenis van Suid-Afrika in Woord en Beeld* (Cape Town: Human & Rousseau), 34.

5.6 With permission from Rich, P., 1996, "A Rainbow People – The Story of the Ndebele People", tv documentary dusk-jacket.

5.7 Wood (n. dim.); Musée de l'Homme, Paris. From Abbate, F. (ed.), 1972, *African and Oceanic Art* (London: Octopus), 12.

5.8 Ibid. (21).

5.9 From Brion, M., 1974, *Cézanne* (London: Thames), 68.

5.10 Oil on canvas (2 1/4 x 18 7/8 in.); Louvre, Paris. *Ibid.* (69).

5.11 Oil on canvas (72 x 92 in.); Museum of Art, Philadelphia. *Ibid.* (67).

5.12 Oil on canvas (25 5/8 x 131 7/8 in.); Kunsthaus, Zurich. *Ibid.* (68).

5.13 Oil on canvas (n. dim.); Pushkin Museum of Art, Moscow. From Porzio and Valsecchi (eds.), 1974, *Understanding Picasso* (New York: Newsweek Books), fig. 19.

5.14 Oil on canvas (n. dim.); National Gallery of Art, Washington DC. From Beckett (1994: 346).

5.15 Oil on canvas (100 x 81 cm); Metropolitan Museum of Art, New York. From Thomas, D., 1981, *Picasso and his Art* (Illinois: Value), 32.

5.16 Oil on canvas (93 x 73 cm); Museum of Art, Philadelphia. *Ibid.* (33).

5.17 Oil on canvas (244 x 238 cm); MoMA, New York. From Beckett (1994: 347).

5.18 (Above) Wooden mask, Etoumbi region, Congo (n. dim.); Musée Barbier-Müller, Geneva. From Varnedoe, K., 1990, *The Meanings of Modern Art – What Makes Modern Art Modern*? (Thames & Hudson), 198.
(Below) Wooden mask, Ivory Coast (n. dim.); Musée de l'Homme, Paris. *Ibid.* (199).

5.19 Pencil and pastel on paper (47 x 63. cm); Kunstmuseum, Basel. From Boudaille, G., 1987, *Pablo Picasso* (London: Alpine), 39.

5.20 Oil on canvas (127 x 196 cm); National Gallery, London. From Smith, R., 1995, *Impressionism – Beneath the Surface* (London: Orion), 151.

5.21 Pen and ink on paper (n. dim.); location unspecified. From Fry, E. (ed.), 1966, *Cubism* (London: Thames & Hudson), 54.

5.22 Oil on canvas (140 x 100 cm); private collection. From Cooper and Tinterow, 1983, *The Essential Cubism – Braque, Picasso and Friends 1907-1920*, Exhibition Catalogue (London: Tate Gallery), 39.

5.23 Oil on canvas (79 x 60 cm); private collection. From Cooper and Tinterow (1983: 43).
5.24 Oil on canvas (92 x 73.5 cm); Stedelijk van Abben Museum, Eindhoven. *Ibid.* (51).
5.25 Oil on canvas (53 x 60 cm); Hermitage Museum, St Petersburg. From Boudaille (1987: 45).
5.26 Oil on canvas (92 x 42 cm); Guggenheim Museum, New York. From Cooper and Tinterow (1983: 53).
5.27 Oil on canvas (73 x 60 cm); Galerie Breyeler, Basel. *Ibid.* (250).
5.28 Oil on canvas (100 x 81 cm); Pushkin Museum, Moscow. From Porzio and Valsecchi (1974: fig. 42).
5.29 Oil on canvas (55 x 45.5 cm); private collection. From Cooper and Tinterow (1983: 76).
5.30 Oil on canvas (50 x 130 cm); private collection. *Ibid.* (273).
5.31 Oil on canvas (100 x 73 cm); Museum of Modern Art, Philadelphia. *Ibid.* (274).
5.32 Oil and printed oil-cloth on canvas (29 x 37 cm); Musée Picasso, Paris. From Porzio and Valsecchi (1974: fig. 45).
5.33 Oil and sand on canvas (65 x 46 cm); location unspecified. From Boudaille (1987: 53).
5.34 Oil and charcoal on canvas (73 x 54 cm); private collection. From Cooper and Tinterow (1983: 90).
5.35 Cardboard, paper, gouache, charcoal and newspaper (no dim.), Musée Picasso, Paris. From Boudaille (1987: 55).
5.36 Collage (64 x 50 cm.); Washington Univ., St Louis. From Thomas (1981: 41).
5.37 Pasted papers, charcoal and ink on paper. (24 1/2 x 18 5/8 in.); MoMA, New York. From Varnedoe (1990: 207).
5.38 Oil on canvas (200 x 200 cm); Centre Georges Pompidou. From Cooper and Tinterow (1983: 313).
5.39 Gouache and graphite on paper (27 x 21 cm); National Gallery of Art, Washington DC. *Ibid.* (347).
5.40 Oil on canvas (200 x 228 cm); MoMA, New York. From Boudaille (1987: 25).
5.41 Oil on canvas (65 x 54 cm); Museum of Art, Rhode Art Island School of Design. From Cooper and Tinterow (1983: 437).
5.42 Oil on canvas (92 x 52 cm); Museum of Art, Columbus. *Ibid.* (431).
5.43 Oil on canvas (116 x 97 cm); Kunsthammlung Nordrheim-Estfalen, Düsseldorf. *Ibid.* (423).
5.44 Oil on canvas (n. dim.); location unspecified. From Nel, P. (ed.), 1990, *JH Pierneef – His Life and Works* (Cape Town: Perskor), 140.
5.45 Oil on canvas (92.5 x 72.5 cm); MoMA, New York. From Cooper and Tinterow (1983: 201).
5.46 Oil on canvas (193 x 130 cm); Kunstmuseum, Basel. *Ibid.* (209).
5.47 Oil on canvas (100 x 81 cm); private collection. *Ibid.* (210).
5.48 Oil on canvas (55 x 46 cm); private collection. *Ibid.* (141).
5.49 Oil on canvas (100 x 65 cm); private collection. *Ibid.* (151).
5.50 Oil on canvas (45 x 58 cm); National Gallery of Art, Washington DC. From Beckett (1994: 261).

CHAPTER 6 THE PICTORIAL DERIVATIVES OF CUBISM

6.1 Oil on canvas (175 x 115 cm), MoMA, New York. From Stangos, N. (ed.), 1991 ed. *Concepts of Modern Art* (London: Thames), fig. 45.
6.2 Oil on canvas (100 x 107 cm); Sprengel Museum, Hannover. From Beckett, Sister W., 1994, *The Story of Painting – The Essential Guide to the History of Western Art* (London: Dorling), 351.
6.3 Oil on canvas (38 1/8 x 47 1/4 in.); MoMA, New York. From Varnedoe, K., 1990, *The Meanings of Modern Art – What Makes Modern Art Modern* (London: Thames & Hudson), 151.

6.4 Oil on canvas with sequins (63 5/8 x 61 1/2 in.); MoMA, New York. From Russell, J., 1991, *The Meanings of Modern Art* (London: Thames), 148.

6.5 Gouache on paper (42 x 34cm); Tate Gallery, London. From Stangos (1991 ed.: fig. 49).

6.6 Oil on canvas (52.7 x 72.4 cm); MoMA, New York. From Moszynska, A., 1990, *Abstract Art* (London: Thames & Hudson), 33.

6.7 Oil on canvas (30 x 24 cm); Art Centre, Des Moines. From Russell (1991: 161).

6.8 Oil on canvas (49. 5 x 65 cm); Musée National d'Art Moderne, Paris. *Ibid.* (18).

6.9 Oil on canvas (oval); Peggy Guggenheim Collection, Venice. *Ibid.* (18).

6.10 Oil on canvas (23 3/4 x 21 1/4 in.); MoMA, New York. From Russell (1991: 116).

6.11 Oil on canvas (8 ft. 2 1/2 in. x 6 ft. 6 1/4 in.); MoMA, New York. *Ibid.* (165).

6.12 Oil on canvas (186 x 193.3 cm); Musée National d'Art Moderne, Paris, From Moszynska (1990: 22).

6.13 Watercolour and oil on linen (17.3 x 38.5 cm); private collection. From Düchting, H., 1997, *Paul Klee – Painting Music* (Munich: Prestel-Verlag), 29.

6.14 Watercolour and ink on paper (36. 8 x 36 cm); private collection. From Barnett and Zweite, (eds.), 1992, *Kandinsky Watercolours and Drawings* (Munich: Prestel-Verlag), 86.

6.15 Oil on canvas (n. dim.); location unspecified. From Jaffé, H., 1990 ed., *Mondrian* (London: Thames & Hudson), 57.

6.16 Oil on canvas (44 7/8 x 34 1/4 in.); Gemeentemuseum, The Hague. *Ibid.* (65).

6.17 Oil on canvas (59 x 33 7/8 in.); Gemeentemuseum, The Hague. *Ibid.* (77).

6.18 Oil on canvas (30 7/8 x 42 3/4 in.); Gemeentemuseum, The Hague. *Ibid.* (83).

6.19 Oil on canvas (30 3/4 x 41 3/4 in.); Gemeentemuseum, The Hague. *Ibid.* (85).

6.20 Oil on canvas (oval.); location unspecified. *Ibid.* (87).

6.21 Oil on canvas (33 1/2 in. x 42 5/8 in.); Rijksmuseum Kröller-Müller, Otterlo. *Ibid.* (91).

6.22 (Left) *Mijntekening* (1914). Pencil and watercolour (n. dim.); Rijksmuseum Kröller-Müller, Otterlo. From Carsten-Peter, Warnecke, *De Stijl 1917-1931* (Cologne: Benedikt, 1991), 38.
(Centre) Study (1916). Gouache on paper (12.7 x 13.3 cm) Rijksmuseum Kröller-Müller, Otterlo. *Ibid.* (38).
(Right) Study (1916). Gouache on paper (13.2 x 13 cm) Rijksmuseum Kröller-Müller, Otterlo. *Ibid.* (39).

6.23 Oil on canvas (47 1/4 x 29 1/2 in.); Solomon Guggenheim Museum, New York. From Jaffé (1990: 93).

6.24 Oil on canvas (19 1/4 x 23 7/8 in.); Max Bill Collection, Zurich. *Ibid.* (99).

6.25 Draft for stained glass window (n. dim.); whereabouts unknown. From Warnecke (1991:46).

6.26 Stained glass (39 x 26 cm); Rijksdienst Beeldende Kunst, The Hague. *Ibid.* (47).

6.27 Oil on canvas (96.5 x 60.5 cm); Museum Ludwig, Cologne. *Ibid.* (63).

6.28 Oil on canvas (39.5 x 35 cm); Gemeentemuseum, The Hague. *Ibid.* (17).

6.29 Gouache and pencil on board (sketch-book.); Rijksdienst Beeldende Kunst, The Hague. *Ibid.* (75).

6.30 Oil on canvas (129 x 114cm); private collection. *Ibid.* (79).

6.31 Oil on canvas (n. dim.); Kostakis Collection, Moscow. From Lodder, C., 1983, "The Kostakis Collection: New Insights into the Russian Avant-Garde", *AD*, vol. 53, no. 5/6: 20.

6.32 Oil on canvas (31 5/8 x 31 5/8 in.); MoMA, New York. From Russell (1991: 242).

6.33 Unspecified reproduction. From Macrae-Gibson, G., 1985, *The Secret Life of Buildings: An American Anthology of Modern Architecture* (Cambridge, Mass.: MIT Press), 19.

6.34 Unspecified reproduction. From Weston, R., 1996, *Modernism* (London: Phaidon), 144.

6.35 Pencil on paper (4 1/2 x 7 in.); location unspecified. From Stangos (1991 ed.: fig. 66).

6.36 Pencil on paper (n. dim.); location unspecified. From Macrae-Gibson (1985: 69).

6.37 Oil on canvas (101.5 x 62 cm); Stedelijk Museum, Amsterdam. From Stangos (1991 ed.: fig. 58).
6.38 Oil on canvas (38 1/2 in. x 26 1/8 in.); MoMA, New York. From Russell (1991: 241).
6.39 Oil on canvas (79 x 79 cm); MoMA, New York. From Stangos (1991 ed.: fig. 67).
6.40 Oil on canvas (66 x 47.5 cm); Thyssen-Bornemisza Foundation, Lugano. From Moszynska (1990: 60).
6.41 Unspecified reproduction. From Weston (1996: 147).
6.42 Lomonossov Factory. From Khan-Magomedov, 1987, *Pioneers in Soviet Architecture – The Search for New Solutions*, trans. A. Lieven (New York: Rizzoli), 36.
6.43 Lomonossov Factory. *Ibid.*

CHAPTER 7 "AFTER CUBISM": PURISM

7.1 *The Fireplace*. Oil on canvas (60 x 73 cm); Fondation Le Corbusier, Paris. From Bosson, V., Von Moos, S., Naegele, D., *et al.*, 1995, *Le Corbusier, Painter and Architect*, exhibition catalogue, Nodjylands Kunstmuseum, Copenhagen: 30 Sept.-10 Dec. 1995 (Denmark: Linde Tryk), 97.
7.2 *Still-Life with Book, Glass and Pipe*. Oil on canvas (n. dim.); Fondation Le Corbusier, Paris. From Baker, G., 1996, *Le Corbusier – The Creative Search* (London: E & FN Spon), 97.
7.3 Pencil on paper (n. dim.); Fondation Le Corbusier, Paris. *Ibid.* (247).
7.4 Pencil on paper (n. dim.); Fondation Le Corbusier, Paris. *Ibid.*
7.5 *The White Bowl*. Oil on canvas (n. dim.); Fondation Le Corbusier, Paris. *Ibid.* (248).
7.6 *The Red Bowl*. Oil on canvas (81 x 65 cm); Fondation Le Corbusier, Paris. *Ibid.*
7.7 *Still-Life with Egg*. Oil on canvas (n. dim.); Fondation Le Corbusier, Paris. *Ibid.* (252).
7.8 Pen and ink on paper (n. dim.); Fondation Le Corbusier, Paris. *Ibid.* (254).
7.9 Pen and ink on paper (n. dim.); Fondation Le Corbusier, Paris. *Ibid.* (253).
7.10 *Study of Purist Object: Bottle, Decanter, Book and Pipe*. Pen and ink on paper (15 x 13 cm); Fondation Le Corbusier, Paris. From Bosson, Von Moos, Naegele, *et al.* (1995: 97).
7.11 *Composition with Guitar and Lantern*, with regulating lines. Oil on canvas (n. dim.); Fondation Le Corbusier, Paris. From Baker (1996: 255).
7.12 *Vertical Guitar*. Oil on canvas (100 x 81 cm); Fondation Le Corbusier, Paris. From Bosson, Von Moos, Naegele, *et al* (1995: 31).
7.13 *Still-Life with Red Violin*. Oil on canvas (100 x 81 cm); Fondation Le Corbusier, Paris. *Ibid.* (30).
7.14 *Still-Life with a Pile of Plates*. Oil on canvas (n. dim.); Fondation Le Corbusier, Paris. From Baker (1996: 244).
7.15 *Still-Life with Siphon*. Oil on canvas (73 x 60 cm); Fondation Le Corbusier, Paris. From Bosson, Von Moos, Naegele, *et al* (1995: 36).
7.16 *Pale Still-Life with Lantern*. Oil on canvas (81 x 100 cm); Fondation Le Corbusier, Paris. *Ibid.* (16).
7.17 *The Bottle of Orange Wine*. Oil on canvas (60 x 73 cm); Fondation Le Corbusier, Paris. *Ibid.* (100).
7.18 *The Bottle of Orange Wine*, with regulating lines. *Ibid.* (86).
7.19 *Still-Life with Numerous Objects*. Oil on canvas (114 x 146 cm); Fondation Le Corbusier, Paris. *Ibid.* (166).
7.20 *Bottle and Book*. Oil on canvas (n. dim.); Fondation Le Corbusier, Paris. *Ibid.* (41).
7.21 *The Accordion Player [Woman with Accordion and Runner]*. Oil on canvas (n. dim.); location unspecified. *Ibid.* (140).
7.22 *Still-Life with Pear*. Oil on canvas (146 x 89 cm); location unspecified. *Ibid.* (48).

7.23 *Woman with Table and Horseshoe*. Oil on canvas (146 x 89 cm); location unspecified. From Bosson, Von Moos, Naegele, *et al* (1995: 45).

7.24 *Still-Life – The Wood-Cutter.* Oil on canvas (89 x 146 cm); Fondation Le Corbusier, Paris. *Ibid.* (169).

7.25 *The Daughter of the Light-House Keeper.* Oil on canvas (n. dim.); location unspecified. Fondation Le Corbusier, Paris. *Ibid.* (169).

7.26 *The Dancer and the Little Feline.* Oil on canvas (146 x 89 cm); Fondation Le Corbusier, Paris. *Ibid.* (105).

7.27 Graphite, pen and watercolour on paper (21 x 27 cm); Fondation Le Corbusier, Paris. Ibid. (182).

7.28 Painted wood (70 cm); location unspecified. *Ibid.* (175).

7.29 Reconstructed drawing. Gans, D., 1987, *The Le Corbusier Guide* (New Jersey: Princeton Univ. Press), 76.

7.30 Photograph by author.

7.31 *Still-Life with Siphon*. Oil on canvas (73 x 60 cm); Fondation Le Corbusier, Paris. From Bosson, Von Moos, Naegele, *et al* (1995: 36).

7.32 Oil and sand on canvas (65 x 46 cm); location unspecified. From Boudaille, G., 1987, *Pablo Picasso* (London: Alpine), 53.

CHAPTER 8 THE CORRESPONDENCE BETWEEN PURIST ART AND PURIST ARCHITECTURE

8.1 Original drawing. From Boesinger, W., 1972, *Le Corbusier, Works and Projects* (Barcelona: Ingoprint), 11.

8.2 *Ibid.*

8.3 *Ibid.*

8.4 *Ibid.*

8.5 *Ibid.*

8.6 *Ibid.*

8.7 From Le Corbusier and Jeanneret, P., 1929; 1964, *The Complete Architectural Works, Volume 1, 1920-1929* (London: Thames & Hudson), 15.

8.8 *Ibid.* (24).

8.9 *Ibid.* (25).

8.10 *Ibid.* (36, 37).

8.11 *Ibid.* (35, 33).

8.12 Pencil on paper (18 x 11 cm); location unspecified. From Baker, G., 1996, *Le Corbusier – The Creative Search* (London: E & FN Spon), 35.

8.13 Gouache and pencil on paper (27 x 21 cm); Fondation Le Corbusier, Paris. *Ibid.*: 32.

8.14 *Ibid.* (51).

8.15 *Ibid.* (53).

8.16 From Le Corbusier and Jeanneret, P. (1929; 1964: 102, 103).

8.17 *The Red Bowl*. Oil on canvas (81 x 65 cm); Fondation Le Corbusier, Paris. From Baker (1996: 248).

8.18 From Le Corbusier and Jeanneret, P. (1929; 1964: 43).

8.19 *Still-life with Red Violin*. Oil on canvas (100 x 81 cm); Fondation Le Corbusier, Paris. From Bosson, V., Von Moos, S., Naegele, D., *et al.*, 1995, *Le Corbusier, Painter and Architect*, exhibition catalogue, Nodjylands Kunstmuseum, Copenhagen: 30 Sept.-10 Dec. 1995 (Denmark: Linde Tryk), 30.

8.20 *Still-Life with a Pile of Plates*, reconstruction with regulating lines. From Baker (1996: 271).

8.21 (Above) Reconstructed drawings. From Benton, T., 1987, *The Villas of Le Corbusier, 1920-1930* (New Haven: Yale Univ. Press), 34, 35.
(Below) Original drawings with regulating lines. From Boesinger (1972, 23).

8.22 (Above) From Le Corbusier and Jeanneret, P. (1929; 1964: 62).
(Below) Reconstructed drawing. From brochure, Musée Maisons La Roche-Jeanneret / Fondation Le Corbusier, Paris.

8.23 *Still-Life with Numerous Objects*. Oil on canvas (114 x 146 cm); Fondation Le Corbusier, Paris. From Bosson, Von Moos, Naegele, *et al.* (1995: 166).

8.24 *Bottle and Book*. Oil on canvas (n. dim.); Fondation Le Corbusier, Paris. *Ibid.* (41).

8.25 Le Corbusier and Jeanneret, P. (1929; 1964: 130, 131).

8.26 *Ibid.* (142, 143, 144).

8.27 *Ibid.* (180, 181).

8.28 (Above) Reconstructed drawings. From brochure, Musée Villa Savoye, Poissy.
(Below) From Le Corbusier and Jeanneret, P. (1929; 1964: 193).

8.29 *The Bottle of Orange Wine*, with regulating lines. From Bosson, Von Moos, Naegele, *et al.* (1995: 100).

8.30 Conversion of original drawing. From Gans, D., 1987, *The Le Corbusier Guide* (New Jersey: Princeton Univ. Press), 25.

8.31 Le Corbusier, 1923; 1987, *Towards a New Architecture*, trans. Etchell, F. (New York: Dover), 150.

8.32 Le Corbusier and Jeanneret, P. (1929; 1964: 50).

8.33 *Ibid.* (93).

8.34 *Ibid.* (159).

8.35 *Ibid.* (193).

8.36 Reconstructed drawings. From Ching, F., 1979, *Architecture – Form, Space and Order* (New York: Van Nostrand), 150.

8.37 Reconstructed drawings. From Baker (1996: 229, 230, 231).

8.38 Le Corbusier and Jeanneret, P. (1929; 1964: 41, 40).

8.39 *Ibid.* (49).

8.40 *Ibid.* (53, 55).

8.41 (Above) Original drawing. From Benton (1987: 73).
(Below) Le Corbusier and Jeanneret, P. (1929; 1964: 66).

8.42 Reconstructed drawings. From Haraguchi, H., 1988, *A Comparative Analysis of 20th Century Houses* (London: Academy Editions), 48-49.

8.42 *Ibid.* (50).

CHAPTER 9 THE VOLUMETRIC TRANSFORMATION OF CUBO-FUTURISM: THE SOVIET AVANT-GARDE

9.1 Bronze (n. dim.) From Cooper and Tinterow, 1983, *The Essential Cubism – Braque, Picasso and Friends 1907-1920*, Exhibition Catalogue (London: Tate Gallery), 361.

9.2 Cardboard, paper, string, canvas, oil and graphite (33 x 16.3 x 7.5 cm); Musée Picasso, Paris. *Ibid.* (363).

9.3 Painted metal and wood (circle), Musée Picasso, Paris. *Ibid.* (371).

9.4 Painted wood (34 x 8.5 cm); location unspecified. *Ibid.* (369).

9.5 Limestone (75.5 cm); Yale Univ. Gallery, New Haven. *Ibid.* (407).

9.6 Painted metal and wood (61 cm); private collection. *Ibid.* (387).

9.7 Bronze (n. dim.); MoMA, New York. From Hughe, R. (ed.), 1967 ed., *Larousse Encyclopedia of Modern Art* (London: Hamlyn), 255.

9.8 Gouache, oil, cardboard, assorted metals and wood (113 x 97 x 115 cm); Peggy Guggenheim Museum, Venice. From Moszynska, A., 1990, *Abstract Art* (London: Thames & Hudson), 31.

9.9 Unspecified reproduction. From Khan-Magomedov, S., 1987, *Pioneers in Soviet Architecture – The Search for New Solutions*, trans. Lieven, A. (New York: Rizzoli), 38.

9.10 Iron and wood (78.5 x 80 x 70 cm), 1980 reconstruction; whereabouts unknown. From Moszynska (1990: 73).

9.11 Wood, metal and cardboard (69.8 x 48 x 7 cm); National Gallery of Art, Washington DC. *Ibid.* (73).

9.12 Unspecified reproduction. From Khan-Magomedov (1987: 42).

9.13 *Ibid.* (42).

9.14 Plastic, wood and metal (n. dim.); Solomon Guggenheim Gallery, New York. From Hughe (1967: 328).

9.15 Plastic (n. dim.), 1951 reconstruction; Solomon Guggenheim Gallery, New York. *Ibid.*: 328.

9.16 Original drawings. From Khan-Magomedov (1987: 40).

9.17 Unspecified reproduction. *Ibid.* (43).

9.18 *Ibid.* (44).

9.19 *Ibid.* (45).

9.20 *Ibid.* (46).

9.21 *Ibid.* (47).

9.22 *Ibid.* (47).

9.23 *Ibid.* (46).

9.24 *Ibid.* (48).

9.25 Original drawings. *Ibid.* (49).

9.26 *Ibid.* (49).

9.27 *Ibid.* (164).

9.28 Unspecified reproduction. *Ibid.* (62).

9.29 *Ibid.* (175).

9.30 *Ibid.* (177).

9.31 *Ibid.* (31).

9.32 *Ibid.*

9.33 *Ibid.* (33).

9.34 Reconstruction. From Moszynska (1990: 89).

9.35 Unspecified reproduction. From Khan-Magomedov (1987: 50).

9.36 *Ibid.* (52).

9.37 Formerly unpublished manuscript; Stedelijk Museum, Amsterdam. From Macrae-Gibson, G., 1985, *The Secret Life of Buildings: An American Anthology of Modern Architecture* (Cambridge, Mass.: MIT Press), 22.

9.38 Malevitch, 1987, *Oeuvres de Casimir Severinovitch Malevitch (1878-1935)*, Paris: Centre Georges Pompidou. *Ibid.* (23).

9.39 Original drawings. From Khan-Magomedov (1987: 34).

9.40 Vintage photograph of model. *Ibid.* (34).

9.41 *Ibid.* (35).

9.42 Unspecified reproduction. *Ibid.* (53).

9.43 Original drawings. *Ibid.* (54).

9.44 *Ibid.* (55).

9.45 *Ibid.* (79).

9.46 *Ibid.* (81).

9.47 Unspecified reproductions. *Ibid.* (60, 118, 120, 124, 125).

9.48 Original drawings. *Ibid.* (180).

9.49 *Ibid.* (183).

9.50 *Ibid.* (184).
9.51 (Left) *Ibid.* (213).
(Right) Vintage photograph. *Ibid.* (213).
9.52 From Cooke, C., 1989, "The Development of the Constructivist Architect's Design Method" in Papadakis, A. (ed.), *Deconstruction Omnibus Volume*, (London: Academy Editions), 29.
9.53 From Papadakis (ed.), *ibid.* (48-49).
9.54 From Chernikhov, I., 1931, extract from *The Construction of Machine Forms* in *ibid.* (39).
9.55 *Ibid.* (39, 56, 57).
9.56 Original drawings. *Ibid.* (60).
9.57 *Ibid.*
9.58 *Ibid.* (61).

CHAPTER 10 THE TECTONIC INCARNATION OF ABSTRACT ART: DE STIJL

10.1 From Nuttgens, P., 1980, *The World's Great Architecture – From the Pyramids to the Centre Pompidou* (London: Hamlyn), 297.
10.2 Warnecke, C-P., 1991, *De Stijl 1917-1931* (Cologne: Benedikt Tashen), 93.
10.3 Vintage photograph. *Ibid.* (101).
10.4 *Ibid.* (114).
10.5 Original drawing. *Ibid.* (115).
10.6 Vintage photograph. *Ibid.* (91).
10.7 *Composition vi.* Gouache on paper (74.4 x 31 cm); private collection. *Ibid.* (100.)
10.8 *Ibid.* (97).
10.9 Gouache and collage on grey cardboard (98 x 73.5 cm); Rijksdienst Beeldende Kunst, The Hague. *Ibid.* (98).
10.10 Colour study for exterior of Block viii. Ink and watercolour (35.6 x 53.3 cm); Institut Néerlandais, Paris. *Ibid.* (103).
10.11 Colour study. Pencil, ink and watercolour (19 x 60 cm); Streekmuseum It Bleekerhûs, Drachten. *Ibid.* (110).
10.12 Reconstruction; Gemeentemuseum, The Hague. *Ibid.* (117).
10.13 Vintage photograph. *Ibid.* (119).
10.14 Beech wood (87 x 60 x 60 cm); Friedman Gallery, New York. *Ibid.* (125).
10.15 Painted beech wood (88 x 68 x 64 cm); Stedelijk Museum, Amsterdam. *Ibid.* (121).
10.16 Oil on canvas (96.5 x 60.5 cm); Museum Ludwig, Cologne. *Ibid.* (17).
10.17 Oil on canvas (39.5 x 35 cm); Gemeentemuseum, The Hague. *Ibid.* (63).
10.18 Van Doesburg, 1925 revision of original colour scheme. Ink, gouache and collage on paper (27 x 21 cm); Rijksdienst Beeldende Kunst. *Ibid.* (130).
10.19 Vintage photograph. *Ibid.* (131).
10.20 Painted beech wood (50 x 50 x 59.5 cm); reproduction. *Ibid.* (126).
10.21 Incandescent globes and oak (35 x 35 x 130 cm); reproduction. *Ibid.* (128).
10.22 Vintage photograph. *Ibid.* (150).
10.23 *Ibid.* (129).
10.24 Painted beech wood (74 x 58 x 106 cm); Friedman Gallery, New York? *Ibid.* (127).
10.25 Ink and gouache on paper (45.7 x 64.7 cm); Gemeentemuseum, The Hague. *Ibid.* (148).
10.26 Colour study. Ink and watercolour on paper; Nederlands Documentatiecentrum voor de Bauwkunst, Amsterdam. *Ibid.* (105).
10.27 Colour study. Watercolour and ink on paper; Nederlands Documentatiecentrum voor de Bauwkunst, Amsterdam. *Ibid.* (108).
10.28 Pencil, gouache and collage on paper (63.4 x 146 cm); Nederlands Documentatiecentrum voor de Bauwkunst, Amsterdam. *Ibid.* (112-113).

10.29 From Warnecke (1991: 161).
10.30 Vintage photograph of model. *Ibid.* (162).
10.31 Reconstructed model. *Ibid.* (169).
10.32 Reconstructed model. *Ibid.* (172).
10.33 *Ibid.* (136)
10.34 Wood painted blue (18x 12 x 12 cm); private collection. *Ibid.* (84).
10.35 Rotated views, unspecified reproduction. From Stangos, N. (ed.), 1991 ed. *Concepts of Modern Art* (London: Thames), fig. 69.
10.36 Vintage photograph. *Ibid.* (101).
10.37 Original drawing. *Ibid.* (115).
10.38 Pencil, ink and gouache on paper (37 x 38 cm); Rijksdienst Beeldende Kunst, The Hague. *Ibid.* (165).
10.39 Unspecified reproduction. *Ibid.* (173).
10.40 Ink and gouache on paper (56.3 x 56 cm); Stedelijk Museum, Amsterdam. *Ibid.* (170).
10.41 Ink and gouache on paper (57.5 x 57 cm); Stedelijk Museum, Amsterdam. *Ibid.* (171).
10.42 Technical drawing. From Stangos (1991 ed.: fig. 76).
10.43 Oil on canvas (15 x 13 3/4 in.); Rothschild Collection, Ossining, New York. From Jaffé, H., 1990 ed., *Mondrian* (London: Thames & Hudson), 109.
10.44 Incandescent globes and oak (35 x 35 x 130 cm); reproduction. From Warnecke (1991: 128).
10.45 Fragment, oil on canvas (42 5/8 x 42 5/8 in.); Kröller-Müller State Museum, Otterlo. From Jaffé (1990: 95).
10.46 Reconstructed drawing, From Stangos (1991 ed.: fig. 80)
10.47 Oil on canvas (23 1/4 x 22 1/4 in.); Sidney Janis Gallery, New York. From Jaffé (1990: 117).
10.48 (Above) Assumed reconstructed drawings. From Frampton, K., 1980, *Modern Architecture: A Critical History* (London: Thames), 146.
(Centre) Warnecke (1991: 136).
(Below) *Ibid.* (141, 142).
10.49 Oil on canvas (136 x 61.50 cm); MoMA, New York. From Stangos (1991 ed.: fig. 75).
10.50 Oil on canvas (79 x 79 cm); MoMA, New York. *Ibid.* (fig. 67).
10.51 Reconstructed drawing. From Banham, R. 1960a; 1996. *The Theory and Design in the First Machine Age* (Cambridge, Mass.: MIT Press), 110.
10.52 Original perspective. *Ibid.* (109).
10.53 Reconstructed drawing. *Ibid.* (130).
10.54 Vintage photograph. From Martienssen, R., July 1941, "Constructivism", *South African Architectural Record*, vol. 27, no. 7: 253.
10.55 Oil on canvas (102 x 102 cm); National Gallery of Art, Washington DC. *Ibid.* (71).
10.56 Oil on canvas (100 x 180 cm); Gemeentemuseum, The Hague. *Ibid.* (77).
10.57 Unspecified reproduction. *Ibid.* (78).
10.58 *Ibid.*(178).
10.59 Wood, copper and plexi-glass (n.dim.). *Ibid.* (80).
10.60 Pencil, ink and gouache (54 x 61 cm); Stedelijk van Abbe Museum, Eindhoven. Original drawing. From Warnecke (1991: 174).
10.61 (Above) *Vintage* photograph. *Ibid.* (185).
(Below) Drawing. *Ibid.*
10.62 (Above) Vintage Photograph. *Ibid.*
(Below) Drawing, *Ibid.* (187).
10.63 *Ibid.* (181).
10.64 *Ibid.*
10.65 Vintage photograph. *Ibid.* (175).
10.66 Unspecified reproduction. *Ibid.* (176).

10.67 Vintage photograph. From Warnecke (1991: 145).
10.68 *Ibid.* (146).
10.69 *Ibid.* (147).
10.70 Hitchcock, H-R., and Johnson, P., 1932; 1995, *The International Style [Architecture Since 1922]* (New York: Norton), 199.
10.71 *Ibid.* (205).
10.72 *Ibid.* (203).
10.73 (Left) Pencil and coloured pencil (95 x 55 cm); Rijksdienst Museum, The Hague.Warnecke (1991: 196).
(Right) Vintage photograph. *Ibid.*
10.74 Original drawing. *Ibid.* (155).

CHAPTER 11 SUMMARY OF FINDINGS AND CONCLUSIONS

11.1 Original drawing. From Macrae-Gibson, G., 1985, *The Secret Life of Buildings: An American Anthology of Modern Architecture* (Cambridge, Mass.: MIT Press), 24.
11.2 Oil on canvas (28 x 27 1/2 in.); MoMA, New York. *Ibid.*
11.3 Original drawing. *Ibid.* (26).
11.4 Oil on canvas (n. dim.); Stedelijk Museum, Amsterdam. *Ibid.*
11.5 Original drawing. *Ibid.* (33).
11.6 Original drawing. *Ibid.*
11.7 Oil on canvas (102 x 102 cm); National Gallery of Art, Washington DC. From Warnecke, P-C., 1991, *De Stijl 1917-1931* (Cologne: Benedikt Tashen), 71.
11.8 Unspecified reproduction. *Ibid.* (78).
11.9 Wood, copper and plexi-glass (n. dim.). *Ibid.* (80).

BIBLIOGRAPHY

Abbate, F. (ed.) 1972. *African Art and Oceanic Art*. London: Octopus Books Ltd.

Alberti, L. 1755, Leoni ed.; 1986. *Ten Books of Architecture*. New York: Dover.

Allard, R. Nov. 1910; 1966. "Au Salon d'Automne de Paris", *L'Art Libre*; translation published as "At the Paris Salon d'Automne" in Fry, E. (ed.), 1966, *Cubism*. London: Thames & Hudson, 62.

Anon. 1963. *L'Opera di Le Corbusier*. Exhibition catalogue. Florence: Palazzo Strozzi.

Anon. 1985, 15th ed. *New Encyclopædia Britannica*. 32 Vols. Chicago: Chicago Univ. Press.

Anon. 1986. *Paintings in the Musée d'Orsay*. Paris: Scala Publications Ltd.

Apollinaire, G. 1913; 1966. *Les Peintres Cubistes* (Paris); translated excerpt published as "The Cubist Painters" in Fry, E. (ed.), 1966, *Cubism*. London: Thames & Hudson, 10-12.

Arnheim, R. 1954; 1974. *Art and Visual Perception: A Psychology of the Creative Eye*. Berkley: California Press.

Baker, G. 1966. *Le Corbusier – The Creative Search*. London: E & FN Spon.

Banham, R. 1960a; 1996. *Theory and Design in the First Machine Age*. Cambridge, Mass.: MIT Press.

Banham, R. 1960b; 1975. "Conclusion: Functionalism and Technology"; reprinted in Serenyi, P. (ed.), 1975, *Le Corbusier in Perspective*. New Jersey: Prentice-Hall, 56-57.

Banham, R. 1962; 1975. *The Age of The Masters*. Surrey: Architectural Press.

Barash, M. 1985. *Theories of Art: From Plato to Winckelmann.* New York: New York Univ. Press.

Barnett and Zweite. (eds.) 1992. *Kandinsky – Watercolours and Drawings*. Munich: Prestal-Verlag.

Beckett, Sister W. 1994. *The Story of Painting – The Essential Guide to the History of Western Art*. London: Dorling Kindersley Ltd.

Behrendt, W. 1937; 1975. "Le Corbusier"; reprinted in Serenyi, P. (ed.), 1975, *Le Corbusier in Perspective*. New Jersey: Prentice-Hall, 44-45.

Benevola, L. 1971. *The History of Modern Architecture, Vol. 2.* Cambridge, Mass.: MIT Press.

Benton, T. 1987. *The Villas of Le Corbusier, 1920-1930*. New Haven: Yale Univ. Press.

Berger, J. 1972. *Ways of Seeing*. London: Penguin.

Berti, L. 1971. *The Uffizi – All Paintings Exhibited in 657 Illustrations*. Firenze: Becocci Editore.

Besset, M. 1968. *Who Was Le Corbusier?* Translation by Kemball, R. Geneva: Editions d'Art Albert Skiva.

Blau, E. and Toy, N. (eds.) 1997. *Architecture and Cubism*. Montréal: Canadian Centre for Architecture.

Boccioni, U. 11 April 1912; 1968. "Manifesto Tecnico della Scultura Futurista"; translation published as "Technical Manifesto of Futurist Sculpture" in Chipp, H. (ed.), 1968, *Theories of Modern Art*. Los Angeles: Univ. of California Press, 298-304.

Boesiger, W. 1972. *Le Corbusier, Works and Projects*. Barcelona: Ingoprint.

Bois, Y-A. 1992. "The Semiology of Cubism", *Symposium*, no. 4: 169-208.

Bois, Y-A. 1995. "Cubistic, Cubic, and Cubist" in Blau, E. and Troy, N. (eds.), *Architecture and Cubism*, Montréal: Canadian Centre for Architecture, 187-194.

Bosson, V., Von Moos, S., Naegele, D., *et al*. 1995. *Le Corbusier, Painter and Architect.* Exhibition catalogue, Nodjyllands Kunstmuseum, Copenhagen: 30 Sept-10 Dec, 1995. Denmark: Linde Tryk.

Bosson, V. 1995a. "Meeting with Le Corbusier" in Bosson, V., Von Moos, S., Naegele, D., *et al.*, *Le Corbusier, Painter and Architect*. Denmark: Linde Tryk, 10-16.

Bosson, V. 1995b. "Le Corbusier – The Architect who became a Painter and Sculptor" in Bosson, V., Von Moos, S., Naegele, *et al.*, *Le Corbusier, Painter and Architect*. Denmark: Linde Tryk, 17-58.

Brion, M. 1974. *Cézanne*. London: Thames & Hudson.

Broadbent, G. 1988. *Design in Architecture: Architecture and the Human Sciences*. London: D. Fuller.

Broadbent, G. (guest. ed.) 1991. "Deconstruction – A Student Guide", *UIA Journal of Architectural Theory and Criticism*. London: Academy Editions.

Boudaille, G. 1987. *Pablo Picasso*. London: Alpine Fine Arts Collection.

Brown, M. 1991. *Art Under Stalin*. Oxford: Phaidon.

Bührman, H. 1982. "Origins and Development of Architectural Perception". Unpublished M. Arch. dissertation, Faculty of Science, Univ. of the Orange Free State.

Burgin, V. 1987, "Geometry and Abjection", *AA Files*, no. 15: 35-41.

Cameron and Spies. (eds.) 1986. *Nuwe Geskiedenis van Suid-Afrika in Woord en Beeld*. Cape Town: Human & Rousseau.

Chagall, M. 1995 ed. *Marc Chagall My Life*. New York: Orion.

Chernikhov, I. 1930; 1989. "Fundamentals of Contemporary Architecture Mid-1920s"; translated extract from *Osnovy Sovremennoi Arkhitektury* (Fundamentals of Contemporary Architecture, Leningrad), translation published in *AD – Russian Constructivism and Iakov Chernikhov*, vol. 59, no. 7/8: 46-50.

Chernikhov, I. 1940s; 1989. "Palaces for Soviet Socialism"; formely unpublished autobiographical notes in *AD – Russian Constructivism and Iakov Chernikhov*, vol. 59, no. 7/8: 82-99.

Chernikhov, I. 1931, 1989. "The Construction of Architectural and Machine Forms Mid-late 20s"; translated extract from *Konstruktsiia Arkhitektunykh i Mashinykh Form* (The Construction of Architectural and Machine Forms, Leningrad), published in *AD – Russian Constructivism and Iakov Chernikhov*, vol. 59, no. 7/8: 58-65.

Ching, F. 1979. *Architecture – Form, Space and Order*. New York: Van Nostrand.

Chipp, H. (ed.) 1968. *Theories of Modern Art*. Los Angeles: Univ. of California Press.

Coll, J. 1996. "Structure and Play in Le Corbusier's Art Work", *AA Files*, no. 31: 3-15.

Collins, P. 1954; 1975. "Modulor"; reprinted in Serenyi, P. (ed.), 1975, *Le Corbusier in Perspective*. New Jersey: Prentice-Hall, 79-83.

Collins, P. 1965; 1998. *Changing Ideals in Modern Architecture 1670-1950*. Montréal: McGill-Queen's Univ. Press.

Collinson, D. 1988 ed. *Fifty Major Philosophers: A reference Guide*. London: Routledge.

Conrads, U. (ed.) 1964; 1970. *Programs and Manifestoes of 20th-century Architecture*. Translation by Humphries, L. Cambridge, Mass.: MIT Press.

Cooke, C. (guest ed.) 1983. *Russian Avant-Garde – Art and Architecture*. London: Academy Editions.

Cooke, C. 1989a. "The Development of the Constructivist Architects' Design Method", in Papadakis, A. (ed.), *Deconstruction Omnibus Volume*. London: Academy Editions, 26-36.

Cooke, C. 1989b. "The Machine as a Model – The Russian Constructivists' Conception of the Design Process", *AD – Russian Constructivism and Iakov Chernikhov*, vol. 59, no. 7/8: x-xv.

Cooke, C. 1989c. "Images or Intelligence", *AD – Russian Constructivism and Iakov Chernikhov*, vol. 59, no. 7/8. London, v-ix.

Cooke, C. 1989d. "Chernikhov, Suprematism and Constructivism", *AD* – Russian Constructivism and Iakov Chernikhov, vol. 59, no. 7/8: 13-17.

Coop Himmelblau. 1984. *Architecture is Now*. London: Thames & Hudson.

Cooper and Tinterow. 1983. *The Essential Cubism – Braque, Picasso and Friends 1907-1920*. Exhibition catalogue. London: Tate Gallery.

Copplestone, T. 1985. *Modern Art*. London: Deans Intl Publishing.
Copplestone, T. 1969. *Architecture – The Great Art of Building*. London: Hamlyn.
Cottington, D. 1997. "The Maison Cubiste and the Meaning of Modernism in Pre-1914 France" in Blau, E. and Troy, N. (eds.), *Architecture and Cubism*. Montreal: Candian Centre for Architecture, 17-40.
Curtis, W. 1996 ed. *Modern Architecture since 1900*. New Jersey: Princeton Univ. Press.

Damaz, P. 1956. *Art in European Architecture*. New York: Reinhold.
De la Porte, J-P. March/April 1988. "The Corbusian Text", *Architecture SA:* 35-37.
De Heer, J. (ed.) 1985. *Kleur en Argitektuur*. Rotterdam: Uitgeverij 010.
Doczi, G. 1981. *Power of Limits – Proportional Harmonies in Nature, Art and Architecture*. Boulder, Colo.: Shambhala Publications.
Doig, A. 1986. *Theo van Doesburg – Painting into Architecture, Theory into Practice*. Cambridge: Cambridge Univ. Press.
Doremus, T. 1985. *Frank Lloyd Wright and Le Corbusier – The Great Dialogue*. New York: Van Nostrand Reinhold.
Dreyer, P. 1974 ed. *Die Wysbegeerte van die Grieke*. Pretoria: Van Schaik.
Droste, M. 1990. *Bauhaus*. Cologne: Benedikt Taschen.
Düchting, H. 1997. *Paul Klee – Painting Music*. Munich: Prestel-Verlag.
Dunning, R. 1991. *Changing Images of Pictorial Space – A History of Spatial Illusion in Painting*. New York: Saracuse Univ. Press.
Dunster, D. (ed.) 1979. "Michael Graves", *Architectural Monographs*, no. 5. London: Academy Editions.

Eisenman, P. 1990. "Aspects of Modernism: Maison Dom-ino and the Self-Referential Sign", *Oppositions*, no. 15: 119-128.

Fletcher, Sir. B. 1945, 12th ed. *A History of Architecture on the Comparative Method*. London: B. T. Batsford Ltd.
Francastel, P. 1951; 1963. "The Destruction of Plastic Space" in Sypher, W. (ed and trans.), *Art History, An Anthology of Modern Criticism*, New York: Vintage Books, 378-398.
Fisher, R. 1989. "A Paradigmatic Approach to Architectural History: Postmodernism." Unpublished M. Arch. dissertation, Faculty of Natural Sciences, Univ. of Pretoria.
Frampton, K. 1968; 1991ed. "De Stijl"; reprinted in Stangos, N. (ed.), 1991 ed., *Concepts of Modern Art*. London: Thames & Hudson, 141-159.
Frampton, K. 1980. *Modern Architecture: A Critical History*. London: Thames & Hudson.
Frayling and Van der Meer. 1992. *The Art Pack: Unique Three-dimensional Tour through the Creation of Art over the Centuries*. New York: Knopf.
Friedman, M. (ed.) 1982; 1988. *De Stijl: 1917-1931 – Visions of Utopia*. Oxford: Phaidon.
Fry, E. (ed.). 1966. *Cubism*. London: Thames & Hudson.

Gabo and Pevsner. 5 Aug. 1920; 1968. "Realistic Manifesto"; translation published in Chipp, H. (ed.), 1968, *Theories of Modern Art*. Los Angeles: Univ. of California Press, 325-330.
Gans, D. 1987. *The Le Corbusier Guide*. New Jersey: Princeton Univ. Press.
Gardiner, S. 1974. *Le Corbusier*. London: Fontana.
Giedion, S. 1941; 1967. *Space, Time and Architecture: The Growth of a New Tradition*. Cambridge, Mass: Harvard Univ. Press.
Glusberg, J. (ed.) 1991. "Deconstruction – A Student Guide", *UIA Journal of Architectural Theory and Criticism*. London: Academy Editions.

Golding, J. 1967; 1991. "Cubism"; reprinted in Stangos, N. (ed), 1991 ed., *Concepts of Modern Art*. London: Thames & Hudson, 50-78.

Golding, J. 1994. *Visions of the Modern*. London: Thames & Hudson.

Green, C. 1987. *Cubism and its Enemies*. New Haven: Yale Univ. Press.

Green, C. 1991."Purism" in Stangos, N. (ed.), 1991 ed., *Concepts of Modern Art*. London: Thames & Hudson, 79-84.

Gris, J. Jan. 1925; 1968. "Chez les Cubistes", *Bulletin de la Vie Artistique*; translation published as "Juan Gris, Response to a Questionnaire on Cubism" in Chipp, H. (ed.), 1968, *Theories of Modern Art*. Los Angeles: Univ. of California Press, 274-277.

Guedes, A. Jan./Feb. 1988. "The Paintings and Sculptures of Le Corbusier", *Architecture SA*: 23-26.

Guiton, J. (ed.). 1981. *The Ideas of Le Corbusier on Architecture and Urban Planning*. NewYork: George Braziller.

Haraguchi, H. 1988. *A Comparative Analysis of 20th Century Houses*. London: Academy Editions.

Harmsen, G. *De Stijl and the Russian Revolution* in Friedman, M., 1982; 1988, *De Stijl: 1917-1931– Visions of Utopia*. Oxford: Phaidon, 45-50.

Heilbroner. R. 1980. *The Wordly Philosophers – The Lives, Times and Ideas of the Great Economic Thinkers*. New York: Touchstone.

Hitchcock H-R. 1948. *Painting Toward Architecture*. New York: Duell, Sloane and Pearce.

Hitchcock, H-R. and Johnson, P. 1932; 1995. *The International Style: Architecture Since 1922*; reprinted as *The International Style*. New York: Norten & Co.

Hochman, E. 1989. *Architects of Fortune: Mies van der Rohe and the Third Reich*. New York: Weidenfeld & Nicolson.

Hughe, R. (ed.) 1967 ed. *Larousse Encyclopedia of Modern Art*. London: Paul Hamlyn.

Hughe, R. 2 Oct. 1989. "Adam and Eve of Modernism – Picasso and Braque's Passionate Adventure in Cubism", *Time:* 58.

Itten, J. 1963; 1975. *Design and Form – The Basic Course at the Bauhaus*. London: Thames & Hudson.

Jaffé, H. 1969; 1990. *Mondrian*. London: Thames & Hudson.

Jencks, C. 1973. *Le Corbusier and the Tragic View of Architecture*. London: Penguin.

Jencks, C. 1977. *The Language of Post-Modern Architecture*. New York: Rizzoli.

Jencks, C. 1980. *Late-Modern Architecture and Other Essays*. London: Academy Editions.

Jencks, C. 1988. "Late-Modernism vs Post-Modernism: The Two-Party System", *UIA Journal of Architectural Theory and Criticism*. London: Academy Editions, 27-38.

Jencks, C. 1990. *The Neo-Moderns: From Late to Neo-Modernism*. New York: Rizzoli.

Johnson, P. and Wigley, M. 1988. *Deconstructivist Architecture*. New York: MoMA.

Khan-Magomedov, S. 1987. *Pioneers of Soviet Architecture – The Search for New Solutions in the 1920s and 1930s*. Translation by Lieven, A. New York: Rizzoli.

Kemp, M. 1987. "Perspective Rectified – Some Alternative Systems in the 19th Century", *AA Files*, no. 15: 30-34.

Kirsch, K. 1989. *The Weissenhofsiedlung*. New York: Rizzoli.

Kokkinaki, I. 1983. "The First Exhibition of Modern Architecture in Moscow", *AD – Russian Avant-garde Art and Architecture*, vol. 53, no. 5/6: 58-61.

Krustrup, M. 1995. "Persona" in Bosson, V., Von Moos, S. Naegele, D. *et al.*, *Le Corbusier, Painter and Architect*. Denmark: LInde Tryk, 118-158.

Kurtich, J. and Eakin, G. 1993. *Interior Architecture*. New York: Van Nostrand Reinhold.

Laclotte, *et al.* 1986. *Painting in the Musée d'Orsay*. Paris: Scala Publications Ltd.

Laude, J. 1971; 1971. *The Arts of Black Africa*. Translation by Decock., J. Los Angeles: Univ. of California Press.

Le Corbusier. 1923; 1987. *Towards a New Architecture*. Translation by Etchell, F. New York: Dover.

Le Corbusier. 1925; 1987. *The Decorative Art of Today*. Translation by Dunnett, J. Cambridge, Mass.: MIT Press.

Le Corbusier. 1926 "Five Points towards a New Architecture", *Almanache de l'Architecture Moderne*; reprinted in Conrads, U. (ed.), 1970 ed., *Programs and Manifestoes of 20th-century Architecture*. Translated by Humphries, L. Cambridge, Mass.: MIT Press, 99-101.

Le Corbusier and Jeanneret, P. 1929; 1964. *The Complete Architectural Works, Volume 1, 1920-1929*. Trans. Boesiger, W. London: Thames & Hudson.

Le Corbusier. 1948a. *New World of Space*. New York: Reynal & Hitchcock.

Le Corbusier. 1948b. *The Modulor*. Cambridge, Mass.: Harvard Univ. Press.

Le Corbusier. 1958. *Modulor 2*. Cambridge, Mass.: Harvard Univ. Press.

Léger, F. 1913; 1966. "Les Origines de la Peintres et sa Valeur Représentative", *Montjoie!* ; translation published as "The Origins of Painting and its Representational Value" in Fry, E. (ed.), 1966, *Cubism*. London: Thames & Hudson, 121-126 .

Léger, F. June 1914; 1966. "Les Réalisations Picturales Actuelles", *Soirées de Paris* (Paris).; translation published as "Contemporary Achievements in Painting" in Fry, E. (ed.), 1966, *Cubism*. London: Thames & Hudson, 135-139.

Lloyd-Jones, H. (ed.) 1965. *The Greek World*. England: Penguin.

Lodder, C. Oct. 1976; 1983. "The Kostakis Collection: New Insights into the Russian Avant-garde", *AD* – Russian Avant-garde Art and Architecture, no. 5/6: 20-25.

Lowman, J. Oct. 1976. "Corb as Structural Rationalist", *Architectural Review*: 229-233.

Lowman, J. 1979. "Le Corbusier 1900-1925: The Years of Transition.", Ph. D. thesis, Univ. of London.

Lucie-Smith, E. 1987. *Movements in Art Since 1945*. London: Thames & Hudson.

Lucie-Smith, E. 1980. *Art in the Seventies*. Oxford: Phaidon Press.

Lupton and Miller. (eds.) 1993. *The ABC's of the Triangle, Square and Circle: The Bauhaus and Design Theory*. London: Thames & Hudson.

Lynton, N. 1974; 1991 ed. "Expressionism" in Stangos, N. (ed.), 1991 ed., *Concepts of Modern Art*. London: Thames & Hudson, 30-49.

Lynton, N. 1991 ed. "Futurism"; reprinted in Stangos, ed., *Concepts of Modern Art*. London: Thames & Hudson, 97-105.

Lyotard, J-F. 1984. *The Postmodern Condition: A Report on Knowledge*. Eng.: Manchester Univ. Press.

Macrae-Gibson, G. 1985. *The Secret Life of Buildings: An American Mythology for Modern Architecture*. Cambridge, Mass.: MIT Press.

Margolius, I. 1975, *Cubism in Arcitecture and the Applied Arts: Bohemia and France 1910-1914*. London: David & Charles.

Martienssen, R. July 1941. "Constructivism", *Architecture Record*, vol. 26, no. 7: 241-272.

Malevich, K. 1924. "Suprematist Manifesto Univos"; translated excerpt from "Die Gegenstandslose Welt", *Bauhausbuch II* (Munich); reprinted in Conrads, U. (ed.), 1970 ed., *Programs and Manifestoes of 20th-century Architecture*. Translated by Humphries, L. Cambridge, Mass.: MIT Press, 87-88.

Malevich, K. 1927; 1968. "Die Gegenstandslose Welt", *Bauhausbuch II* (Munich); translated excerpt published as "Introduction to the Theory of the Additional Element in Painting" in Chipp, H. (ed.), 1968, *Theories of Modern Art*. Los Angeles: California Press, 337-340.

Malevich, K. 1927; 1968. "Die Gegenstandslose Welt 2", *Bauhuasbuch II* (Munich); translated excerpt published as "Suprematism" in Chipp, H. (ed.), 1968, *Theories of Modern Art*. Los Angeles: California Press, 341-346.

Metzinger, J. and Gleizes, A. 1912; 1966. *Du Cubisme* (Paris); translated excerpt reprinted as "Cubism" in Fry, E (ed.), 1966, *Cubism*. London: Thames & Hudson, 105-111.

Mondrian, P. 1919; 1968. "De Nieuwe Beelding in de Schilderkunst", *De Stijl*, vol. 3, no. 1; translation published as "Natural Reality and Abstract Reality" in Chipp, H. (ed.), 1968, *Theories of Modern Art*. Los Angeles: California Press, 321-325.

Mondrian, P. 1937; 1968. "Figurative Art and Nonfigurative Art", *Circle*; reprinted as "Plastic Art and Pure Plastic Art" in Chipp, H., 1968, *Theories in Modern Art*. Los Angeles: California Press, 358-362.

Moszynska, A. 1990. *Abstract Art*. London: Thames & Hudson.

Murray, I. Z. 1997. "The Burden of Cubism: The French Imprint on Czech Architecture, 1910-1914" in Blau, E. and Troy, N. (eds.), *Architecture and Cubism*. Montréal: Canadian Centre for Architecture, 41-58.

Naegele, D. 1995. "Photographic Illusionism and the 'New World of Space'" in Bosson, V., Von Moos, S., Naegele, D. *et al.*, *Le Corbusier, Painter and Architect*. Denmark: Linde-Tryk, 118-158.

Nel, P. (ed.) 1990. *JH Pierneef – His Life and Work*. Cape Town: Perskor.

Norberg-Schultz, C. 1975. *Meaning in Western Architecture*. London: Studio Vista.

Norris and Benjamin. 1988. *What Is Deconstruction?* London: Academy Editions.

Nuttgens, P. 1980. *The World's Great Architecture – From the Pyramids to the Centre Pompidou*. London: Hamlyn.

Ozenfant, A. 1925; 1966. "La Peinture Moderne" (Paris); translation published as "Towards the Crystal" in Fry, E. (ed.), 1966, *Cubism*. London: Thames & Hudson, 171-172.

Ozenfant, A. 1931; 1952. *Foundations of Modern Art*. New York, Dover.

Ozenfant, A. 1968; 1973. *Ozenfant*. New York: M. Knoedler.

Padovan, R. Dec. 1987. "The Pavilion and the Court – Cultural and Spatial Problems of De Stijl Architecture", *Architectural Record:* 359-368.

Palladio, A. 1738 unabridged; 1965. *The Four Books of Architecture*. Translated by Ware, I. New York: Dover.

Papadakis, A. (ed). 1988. *Deconstruction in Architecture*. London: Academy Editions.

Papadakis, A. (ed). 1989. *Deconstruction 2*. London: Academy Editions.

Papadakis, A. (ed). 1989. *Deconstruction Omnibus Volume*. London: Academy Editions.

Papadakis, A. (ed). 1990. *The New Modern Aesthetic*. London: Academy Editions.

Papadakis, A. (ed). 1992. *Modern Pluralism – Just Exactly What is Going On?* London: Academy Editions.

Penrose, R. 1958. *Picasso: His Life and Work*. New York: Harper.

Pevsner, N. 1936; 1960. *Pioneers of the Modern Movement [Modern Design] from William Morris to Walter Gropius*. Eng.: Penguin.

Pevsner, N. 1942. *Outline to European Architecture*. London: Pelican.

Picasso, P. May 1923; 1966. "Picasso Speaks", *The Arts*; reprinted as "Statement to Marius de Zayas" in Fry, E. (ed.), 1966, *Cubism*. London: Thames & Hudson, 165.

Placzek, A. (ed.) 1982 ed. *Macmillan Encyclopedia of Architects*. 4 Vols. London: Collier Macmillan.

Plato. 1971 ed. *Timaes and Critias*. Translated by Lee, H. Eng., Middlesex: Penguin.

Plato. 1966 ed. *The Last Days of Socrates: Euthyphro, The Apology, Ctrito and Phaedo.* Baltimore: Penguin.

Plattus, A. 1987. "Le Corbusier: A Dialectical Itinery" in Gans, *The Le Corbusier Guide.* New Jersey: Princeton Univ. Press, 9-23.

Poliansky, A. 1987. "Introduction", *AD* – Uses of Tradition in Russian and Soviet Architecture, vol. 57, no. 7/8: 6.

Porzio and Valsecchi. (eds). 1974. *Understanding Picasso.* New York: Newsweek Books.

Puy, M. July 1911; 1966. "Les Indépendants", *Les Marges* (Paris); translation published as "The Salon des Indépedants" in Fry, E. (ed.), 1966, *Cubism.* London: Thames & Hudson, 65.

Radice, B. 1965; 1971. *Who's Who in the Ancient World.* London: Penguin.

Raynal, M. 1912; 1966. "Conception et Vision"; trans. published as "Conception and Vision" in Fry, E. (ed.), 1966, *Cubism.* London: Thames & London, 96.

Reichlin, B. 1997. "Jeanneret-Le Corbusier, Painter-Architect" in Blau, E. and Troy, N. (eds.), *Architecture and Cubism.* Montréal: Canadian Centre for Architecture, 195-218.

Richards, J. 1981. *The National Trust Book of English Architecture.* London: Club Book Ass.

Robertson, M. 1965. "The Visual Arts of the Greeks" in Lloyd-Jones, H. (ed.), *The Greek World.* Enland: Penguin, 168-228.

Robson, I. (ed.). 1992. *Kandinsky – Watercolours and Drawings.* Munich: Prestel-Verlag.

Rowe, C. 1947; 1975. "The Mathematics of an Ideal Villa: Palladio and Le Corbusier Compared"; reprinted in Serenyi, P. (ed.), 1966, *Le Corbusier in Perspective.* London: Thames & Hudson, 46-55.

Rowe, C. and Slutzky, R. 1963. "Transparency: Literal and Phenomenal", *Perspecta,* no. 8: 45-54.

Rowe, C. and Slutzky, R. 1971. "Transparency: Literal and Phenomenal Part II", *Perspecta,* no. 13/14 : 287-301.

Russell, J. 1991. *The Meanings of Modern Art.* London: Thames & Hudson.

Salmon, A. 1912; 1966. "La Jeune Peinture Française"; translation published as "Anecdotal History of Cubism" in Fry, E. (ed.), 1966, *Cubism.* London: Thames & Hudson, 81-90.

Scharf, A. 1966; 1991 ed. "Constructivism"; reprinted in Stangos, N. (ed.), 1991 ed. *Concepts of Modern Art.* London: Thames & Hudson, 160-168.

Scharf, A. 1966; 1991 ed. "Suprematism"; reprinted in Stangos, N. (ed.), 1991 ed., *Concepts of Modern Art,* London: Thames & Hudson, 138-140.

Schumacher, T. Jan. 1987. "Deep Space", *Architectural Review,* no. 79, vol. clxxxi: 37-42.

Serenyi, P. 1965; 1975. "Le Corbusier's Changing Attitude Toward Form"; reprinted in Serenyi, P. (ed.), 1975, *Le Corbusier in Perspective.* New Jersey: Prentice-Hall, 68-73.

Serenyi, P. (ed.). 1975. *Le Corbusier in Perspective.* New Jersey: Prentice-Hall.

Shvidkovsky, O. 1987. "Tradition and Modernity – Whither Soviet Architecture Today?", *AD – Uses of Tradition in Russian and Soviet Architecture,* vol. 57, no. 7/8: 7-8.

Slutzky, R. 1990. "Aqueous Humor", *Oppositions,* no. 19/20: 29-37.

Smith, P. 1995. "Impressionism – Beneath the Surface". London: Orion Publishing Group.

Smith, R. 1980; 1991 ed. "Conceptual Art"; reprinted in Stangos., N. (ed.), 1991 ed., *Concepts of Modern Art.* London: Thames & Hudson, 256-273.

Smithsons, A. and P. 1981. *The Heroic Period of the Modern Movement.* London: Thames & Hudson.

Spate, V. 1980; 1991 ed. "Orphism"; reprinted in Stangos, N. (ed.), 1991 ed., *Concepts of Modern Art.* London: Thames & Hudson, 85-96.

Stangos, N. (ed.). 1974; 1991 ed. *Concepts of Modern Art.* London: Thames & Hudson.

Stirling, J. 1953; 1975. "Garches to Jaoul: Le Corbusier's Domestic Architecture in 1929 and 1953"; reprinted in Serenyi (ed.), 1975, *Le Corbusier in Perspective*. New Jersey: Prentice-Hall, 64-67.

Summerson, J. "Architecture, Painting and Le Corbusier", *Heavenly Mansions and Other Essays*. New York: Norton & Co., 177-194.

Sutton, K. 1966. *Picasso*. London: Spring Art Books.

Thilly, F. 1993. *A History of Philosophy*. Allahabad: Central Publishing House.

Tiege, K. 1929; 1975. "The Mundaneum"; reprinted in Serenyi, P. (ed.), 1975, *Le Corbusier in Perspective*. New Jersey: Prentice-Hall, 40-43.

Thomas, D. 1981. *Picasso and His Art*. Illinois: Book Value Intl.

Turner, P. 1971. "The Education of Le Corbusier – A Study of the Development of Le Corbusier's Thoughts, 1900-29". Unpublished Ph. D. thesis, Dept of Fine Arts, Harvard Univ.

Turner, P. 1971; 1975. "Beginnings of Le Corbusier's Education, 1902-07"; reprinted in Serenyi, P. (ed.), *Le Corbusier in Perspective*. New Jersey: Prentice-Hall, 18-25.

Van Doesburg, T., Van't Hoff, R., Huszar, V., *et al.*, Nov. 1918, "'De Stijl': Manifesto I", *De Stijl*, vol. 2, no. 1; reprinted in Conrads, U. (ed.), 1970 ed., *Programs and Manifestoes of 20th-century Architecture*. Translated by Humphries, L. Cambridge, Mass.: MIT Press, 39-40.

Van Doesburg, T. 1924; 1970 ed. "Towards a Plastic Architecture", De Stijl, vol. 12, no. 6/7; reprinted in Conrads, U. (ed.), 1970 ed., *Programs and Manifestoes of 20th-century Architecture*. Translated by Humphries, L. Cambridge, Mass.: MIT Press, 78-80.

Van Doesburg, T., Van Eesteren, C., and Rietveld, G. 1923, "'De Stijl': Manifesto V: - □ + = R4 – Towards Collective Building [Construction]", De Stijl [n. no.]; reprinted in Conrads, U. (ed.), *Programs and Manifestoes of 20th-century Architecture*. Translated by Humphries, L. Cambridge, Mass.: MIT Press, 66-67.

Varnedoe, K. 1990. *A Fine Disregard – What Makes Modern Art Modern*. London: Thames & Hudson.

Vitruvius, P. 1914 ed; 1960. *The Ten Books on Architecture*. Translation by Morgan, M. New York:: Dover.

Von Moos, S. 1968; 1975. "Origins, Youth, Travels"; reprinted in Serenyi, ed., 1975, *Le Corbusier in Perspective*. New Jersey: Prentice-Hall, 13-17.

Von Moos, S. 1979. *Le Corbusier, Elements of a Synthesis*. Cambridge, Mass: MIT Press.

Von Moos, S. 1995. "Charles Edouard Jeanneret and the Visual Arts" in Bosson, V., Von Moos, S., Naegele, D., *et al.*, *Le Corbusier, Painter and Architect*. Denmark: Linde Tryk, 59-82.

Von Vegesack, A. (ed.) 1992. *Czech Cubism; Architecture, Furniture and Decorative Arts 1910-1925*. New York: Princeton Architectural Press.

Wallace, R. 1971. *The World of Van Gogh: 1853-1890*. The Netherlands: Time-Life.

Warnecke, C-P. 1991. *De Stijl 1917-1931*. Cologne: Benedikt Tashen.

Watkin, D. 1977. *Morality in Architecture*. Eng.: Oxford Univ. Press.

Werth, L. June 1910; 1966. "Exposition Picasso", *La Phalange*; translation published as "Picasso", in Fry, E. (ed.), 1966, *Cubism*. London: Thames & Hudson, 50.

Weston, R. 1966. *Modernism*, London: Phaidon.

Wilhide, E. 1994. *William Morris – Decor and Design*. London: Pavilion.

Wittkower, R. 1962. *Architecural Principle in the Age of Humanism*. London: Alec Tiranti.

Wittkower, R. 1963; 1975. "Le Corbusier's Modulor"; reprinted in Serenyi, P. (ed.), 1975, *Le Corbusier in Perspective*. New Jersey: Prentice-Hall: 80-85.

Welsch, R. "De Stijl: A Reintroduction". 1982; 1988, in Friedman, M. (ed.) De Stijl: 1917-1931 – *Visions of Utopia.* (Oxford: Phiadon), 17-31.

Whitford, F. 1984; 1991. *Bauhaus*. London: Thames & Hudson.

Wright, F. 1992. *Frank Lloyd Wright Collected Writings*. Pfeiffer, B (ed.). New York: Rizzoli.

Zevi, B. 1957. *Architecture as Space: How to Look at Architecture*. Translation by Gendel, M. New York: Horizon Press.

Zevi, B. 1978. *The Modern Language of Architecture*. Seattle: Univ. of Washington Press.

Zhadova, L. (ed.). 1984; 1988. *Tatlin*. Trans. Filotas, P., Julian, M., Lockwood, E., *et al.* London: Thames & Hudson.
