Adı: **Deniz GÜNER**

School: **İzmir Yüksek Teknoloji Enstitüsü**

Department: **Architecture**

Major: **Architecture (Doctorate)**

Title of Thesis: **Construction of Time Conception in Architectural Realm, Sigfried Giedion and *Space, Time and Architecture***

ABSTRACT

The main idea aimed in this dissertation is to deconstruct the transposition process of the concept of time from a term of art history into that of architecture.

Thesis begins with the transforming effects of the art historical space conceptions in the 19th century German architectural theories on the formation of 20th century modern architectural space conception as "Space-time." Space-time is termed by the avant-gardist architectural historian-critic Sigfried Giedion in the beginning of the first quarter of the twentieth century to characterize the morphological and structural forms of the new modes of spatial experience, temporal consciousness and self-evidency as the new characteristics of architectural Modernity.

Apart from the Swiss art history tradition he has been trained, Giedion undertakes a leading role and owing to his historian background, constitutes a model both in establishment of historiography of modern architecture and in shaping the role of an architectural historian. Within the framework of his dual programmatic roles of Avant-gardist architectural historian and of mediator historian, suggesting the unification of architecture and life, Giedion renders architecture as the origin and apparatus of the holistic cultural renewal he has been striving to realize. In line with his Hegelian *Telos* of Unity, in order to justify his unification *ethos* he has proposed in every field of life between "feeling" and "thought," Giedion invents scientific and artistic footings. Giedion sets on his Hegelian understanding of history as *Zeitgeist* to support the self-evidencies of scientific and artistic indications, which are operatively selected and connected by himself.

Under the effect of this unification *ethos*, having made an attack on transposing the concept of time into architectural realm as "Space-time," Giedion has constructed it to characterize the architectural Modernity and at the same time, has paradoxically started to equip the meaning of his "Space-time" invention with the therapeutic ideology, which aimed to dissolve "tensions" and to eliminate all symptomatic "illnesses" of the modernization process.

Within the context of the operative historian figure of architectural Modernity, the thesis reveals how Giedion has constructed the Space-time conception throughout his book *Space, Time and Architecture* written in 1941 and with continuous additions to the book, how he has transformed the concept both in terms of content and meaning. This dissertation presents under which traditions, conditions, motivations and mentalities Giedion has invented the Space-time concept, deciphering how the content of the concept has been transformed through deconstruction of persuasion mechanisms and narrative techniques used in order to render this invention as self-evident.

Within the framework of this demystifying and deconstructing approaches, thesis examines how the idea of space constituted and framed by the psychology, physiognomy and Gestalt theories of the 19th century have been transformed into spatial experience at the beginning of the 20th century and how Giedion transposes this spatial experience into "Space-time" as the morphological, spatial, temporal and syntaxial characteristics of modern architecture.

This dissertation presents how the diversified traces of time theorizations ranging from the 19th century pseudo-scientific fourth dimension theories to non-Euclidean Geometry theories, from Einstein's General Theory of Relativity to anthropomorphic time conceptualizations in philosophy are continued by Giedion have been deciphered.

Transforming the static relationship between subject-object by suggesting the mobilization of Subject and the disengagement in syntax between the parts and totality of the Object, Giedion addresses the Cubist painting as a shift in the reception of "hidden" and "unseen" fragments of the Reality and it's "contemporaneous" Einstein's General Theory of Relativity as the scientific footing for the temporal characteristic of the spatial experience. Elaborating the 19th century art-historical

space conceptions, the principles of a-perspectival view in the new mode of visual perception theories, which include time consciousness within the spatial experiences and the fragmented totality of the mentally constructed images of modern space conception in post-cubist reception theories, this dissertation scrutinizes, the techniques of expanding the meaning of Space-time conception and the mechanisms of persuasion that convert the meaning into a metaphoric narrative and the representative instrument of Modernity in the last edition of the book *Space, Time and Architecture*.

Consequently, it has been analyzed how the two important concepts of Space and Time have undergone changes and transformations until they have been reached to Giedion, and how he has adopted this intellectual heritage and transformed it into "Space-time" that amounts to the modern space conception of the 20th century.

Key Words: Space-time; Sigfried Giedion; *Space, Time and Architecture*; Architectural Historian; Historiography of Modern Architecture.

Adı: **Deniz GÜNER**

Okul: **İzmir Yüksek Teknoloji Enstitüsü**

Anabilim Dalı: **Mimarlık**

Programı: **Mimarlık (Doktora)**

Tez Başlığı: **Zaman Düşüncesinin Mimarlık Alanında İnşaası; Sigfried Giedion ve *Space, Time and Architecture***

ÖZ

Bu çalışmanın temel amacı, zaman kavramının sanat tarihi alanından mimarlık alanına aktarılma sürecinin yapısökümüne uğratılmasıdır.

Tez, 19.yy Alman mimarlık kuramlarındaki sanat tarihinin mekan kavramlaştırmalarının, 20. yy modern mimari mekan kavramının "Mekan-zaman" olarak biçimlenmesindeki dönüştürücü etkileri ile başlar. Öncü mimarlık tarihçisi ve eleştirmeni Sigfried Giedion'un yirminci yüzyılın ilk çeyreğinde, mekansal deneyimin, zamansallık bilincinin ve kendinden açık-seçikliğin yeni tarzlarının morfolojik ve yapısal biçimlerini, mimari Modernite'nin yeni özellikleri olarak karakterize etmek için "Mekan-zaman" olarak adlandırır.

Eğitimini aldığı İsviçre sanat tarihi geleneğinden ayrı olarak Giedion, Modern mimarlığın tarih yazımının oluşturulmasında ve mimarlık tarihçisi rolünün biçimlenmesinde hem öncü bir rol üstlenir, hem de tarihçi kişiliği ile model olur. Barındırdığı öncü mimarlık tarihçisi ve uzlaştıran tarihçi gibi ikili düzenleyici rolleri çerçevesinde Giedion, mimarlık ile yaşamın birleşmesini önererek, mimarlığı, gerçekleştirmeye çalıştığı bütüncül kültürel yenilenmenin kaynağı ve aracı kılar. Hegelci birlik *Telos*'u doğrultusunda Giedion, hem "duygu" ve "düşünce" arasında, hem de yaşamın her alanında önerdiği birleşme *ethos*'unu meşru kılmak üzere, bilimsel ve sanatsal dayanaklar icat eder. Giedion, kendisinin etkin olarak seçtiği ve bağlantılandırdığı bilimsel ve sanatsal göstergelerin kendinden-açık-seçik olduklarını desteklemek üzere, *Zeitgeist* olarak adlandırılan Hegelci tarih anlayışını öne sürer.

Bu bütünleştirme *ethos*'unun etkisi altında mimari Modernite'yi tanımlama ve zaman kavramını mimarlık alanına "Mekan-zaman" olarak aktarma girişimiyle

Giedion, icat ettiği "Mekan-zaman" kavramının anlamını paradoksal olarak, modernleşme sürecinin gerilimlerini çözmeyi ve "hastalık belirtilerini" gidermeyi amaçlayan sağaltıcı ideoloji ile donatmaya başlar.

Bu çalışmada, mimari Modernite'nin etkin tarihçi figürü bağlamında Giedion'un, 1941'de yazdığı *Space, Time and Architecture* kitabı boyunca "Mekan-zaman" kavramını nasıl inşa ettiği ve kitaba yaptığı eklemeler sayesinde kavramın içerik ve anlamında yaptığı dönüşümler sergilenir. Giedion'un hangi gelenekler, koşullar, motivasyonlar ve zihniyetler altında "Mekan-zaman" kavramını icat ettiği, bu buluşunu "kendinden açık-seçik" kılmak için hangi tür ikna mekanizmaları ve anlatı teknikleri kullandığı yapısökümüne uğratılarak, kavramın içeriğini nasıl dönüştürdüğü deşifre edilir.

Bu gizemçözücü ve yapısökümcü yaklaşımlar bağlamında tezde, 19.yy'da psikoloji, fizyonomi ve Gestalt kuramlarının sınırlarını çizerek tesis ettikleri mekan düşüncesinin, 20.yy başında öznelleşerek nasıl mekansal deneyim'e döndüğü ve Giedion'un bu mekansal deneyimi, modern mimarlığın morfolojik, mekansal, zamansal ve sözdizimsel karakteristiği olarak "Mekan-zaman" kavramına nasıl aktarıdığı incelenir.

Bu tezde, 19.yy'ın sahte-bilimsel dördüncü boyut kuramlarından Öklidçi-olmayan geometri kuramlarına, Einstein'nın Relativite teorisinden felsefedeki insanbiçimci zaman kavramsallaştırmalarına kadar çeşitlenen zaman kuramlaştırmalarının izlerinin Giedion'da nasıl devam ettiği deşifre edilir.

Öznenin hareketliliğini, Nesnenin ise bütünü ile parçaları arasındaki sözdiziminin çözülmesini önererek, özne ile nesne arasındaki statik ilişkiyi dönüştüren Giedion, Kübist resmi, Gerçekliğin gizli ve görünmez parçalarının alımlanmasında bir kayma, bunun "çağdaşı" Einstein'ın Rölativite kuramını da, mekansal deneyimin zamansal özelliği için bilimsel bir dayanak olarak sunar.

19.yy'da sanat tarihindeki mekan düşüncelerini, mekansal deneyimdeki zaman bilincinini de barındıran yeni tarz görsel algı kuramlarını, perspektif-dışı bakış ilkelerini ve Kübizm-sonrası'nın alımlama kuramlarındaki, modern mekanın zihinde kurgulanan parçalı-bütünlüklü yapısını ayrıntılı olarak ele alan bu çalışma, *Space, Time and Architecture* kitabının son basımında, "Mekan-zaman" kavramınının

anlamını, Modernite'nin temsil aygıtına ve metaforik anlatısına dönüştüren, anlamı genişletme teknikleri ve ikna mekanizmaları inceler.

Sonuç olarak, mekan ve zaman gibi iki önemli kavramın Giedion'a ulaşıncaya kadar geçirdikleri değişim ve dönüşümler sergilenerek, Giedion'un bu düşünsel mirası nasıl benimsediği ve 20.yy modern mekan düşüncesini ifade eden "Mekan-zaman"a nasıl dönüştürdüğü analiz edilmiştir.

Anahtar Kelimeler: Mekan-Zaman; Sigfried Giedion; *Space, Time and Architecture*; Mimarlık tarihçisi; Modern Mimarlığın Tarihyazımı.

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Anahtar Kelimeler: Mekan-Zaman; Sigfried Giedion; *Space, Time and Architecture*; Mimarlık tarihçisi; Modern Mimarlığın Tarihyazımı.

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CHAPTER 1

INTRODUCTION

The aim of this thesis is to scrutinize how the concept of time as unfamiliar to architectural terminology is unified with the concept of space by architectural historian Sigfried Giedion and then be constituted within the field of architecture as "Space-time."

The relationship, which is thought to exist between architecture and time is widely accepted and canonized inquiry, under the effect of Sigfried Giedion's book *Space, Time and Architecture*[1] where he presents his theories and ideas on modern space conception, which is continuously developed throughout contemporaneously irrespective of any the five editions from 1941 until 1967.

In the will to constitute theoretically the first three decades of the 21st century under the name of "Modernism" on the one hand, and to construct and represent the unification of architecture and art, science and Hegelian history on the other, Giedion regards the "Space-time" conception as a part of architectural terminology.

Contrarily to schism caused by modernization generally and by industrialization specifically, Giedion suggests unification in all fields of life, playing a dominant role in German architectural theory since the turn of the 19th century.[2] In order to justify this unity, Giedion constitutes numerous "imaginary" presuppositions like the "Collapsing Culture."

The systematic as well as dialectic methodology in his thinking is self-affirmation through negation. Taking his departure point from the presumption that civilization and culture could not develop under the adverse circumstances of the era, Giedion suggests reorganization and restructuring based on producing the conditions for progress. Due to

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[1] The editions of the book have taken place in years 1941, 1949, 1954, 1962, and 1967. This study is based on Sigfried Giedion's *Space, Time and Arcitecture; The Growth of a New Tradition*, (Cambridge, Mass.; Harvard University Press, 1967 [1941]) U.S. Edition in 1976 as the Sixth Printing.

[2] For a study examining the contradiction between Unity and Schism at the turn of the 19th century regarding the construction process of German Architectural Identity, please see *German Architectural Theory and*

involvement of such concepts of humanity, civilization, democracy and culture as identical, the unification project he has been working on is transformed into a "rescue project for humanity/civilization/culture" as equipped with the ideological engagements. In order to justify this attempt for rescue, he firstly convinces the readers to the current circumstances of an indefinite and chaotic structure. After constructing numerous analogies, parallelisms and fictive presuppositions to convince, he presents his own approach as a solution to this adverse circumstance. Due to this tautological characteristic presented as a reply to these adverse circumstances he has constituted his own historiography which, turns into an ideological persuasion mechanism.

Giedion's methodology of thinking is developed within a successive, deterministic and linear layout, which proceeds from the general to the specific, defines the conditions to provide for its own circumstances where the existence of each circumstance is dependent upon the previous one.

Giedion constructs those "realities," which constitute the basis of his methodology of affirmative thinking that cannot be received and has been aware of their own era as listed in the following:

- He criticizes lack of any holistic and balanced environment by virtue of the chaotic condition caused by mechanization and industrialization as being the reasons underpinning the Schism between "Feelings" and "Thoughts." He also criticizes Rationalization, Alienation and Specification, in short, Modernization.
- He presents the adverse impacts of mechanization upon the individual: Compartmentalization process and the split personalities caused; Psychical and logical separation rendered as identical with the duality of feeling and thought, etc.
- He criticizes the modern individual since the split personality cannot be aware of Truth due to lack of holistic "insight" and "universal outlook," loses its power of foreseeing and cannot be able to foresee future.

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the Search for Modern Identity, Mitchell Schwarzer, (Cambridge: Cambridge Uni. Pr., 1995), esp. chapter

- He claims fragmented personalities for not being able to be aware of the "Truth" and therefore not fostering "Creativity." Due to the loss of "Truth," he advocates the invalidity in ethical judgement values like true or false and aesthetical judgement values like good or bad.
- By virtue of loss of creativity, he claims that "History" cannot be realized. As there remain no consciousness and responsibility for history, he alleges that meaning has been lost.
- As a result of loss of meaning, he claims that culture has run out of any content and cannot be produced.
- Under these circumstances, he implies that there will be no progress and culture and civilization will collapse.

In line with Giedion's ideologue and avant-gardist historian personality and his culturalist point of view, he constructs the conception of "Space-time" in order to eliminate the adverse aspects of modernization and provide for a holistic unity in all fields of life and in architectural modernity.

The main idea aimed in this dissertation is to deconstruct and demystify the "Space-time" conception constructed by Giedion as a unification instrument of the therapeutic ideology, which is to dissolve the schism caused by the Modernization process. Depending on the construction and canonization processes of the concept and the diversity of its meaning and use, the purpose has been to analyze such methods that expand its meaning and content. As a result of deciphering such processes as meaning expanding like analogy, parallelism or persuasion mechanisms and also as justification and canonization, the way how Giedion's mentality has constructed, framed, characterized and mystified modern space concept and Modernism is questioned.

Owing to the *Telos* of Unity it has been based on, Giedion's paradoxical discourse of Modernity alleges to overcome "pastoral" and "counterpastoral" or "decadent"

5: "Unity and Schism at the Turn of the Century", pp. 215-260.

interpretations of Modernity.[3] According to Giedion, due to *Geistesleben* character in Simmelian terms, the modern individual constructs a numbed and unconscious relationship with the exterior world. On the other hand, the daily life phenomena have been called by Giedion as "Constituent Facts" for their unseen, hidden and secret character devoid of any volitional power and their necessity and usefulness in addition to having been repeated throughout history. Via such concepts as "Creative force in anonymous objects," "immortality," "unpretentious," "unconsciousness," Giedion re-conceptualizes the entire allusions of the Tradition in order to define the "Modern." By virtue of his imitation of uninterrupted continuity of the Tradition, Giedion attempts to construct the traditionally-owned characteristics like "anonymity," "irrespective to any inquiry," "modesty," etc., all as a continuity for the "Modern" and even the "Modern Architecture." His mistake lies in the effort to "individually" construct the autonomous and anonymous tradition in a "self-actualizing" way. Though it may seem normal for him to have chosen the title "The Growth of a New Tradition" for a sub-title of his book, what remains to be weird is the word "New" preceding the word "Tradition." Hence, while Giedion aims at eliminating all conventions to construct Modernity in an avant-gardist manner, he paradoxically proposes to construct Modernity by imitating the characteristics of the Tradition.

Having preferably inherited the approach of Hegelian and neo-Kantian synthesis, Giedion proposes two modes of synthesis. On the one side dialectical *aporia* of an avant-garde character, and on the other, synthetical parallelism. Based on his own model, Giedion develops two different historian roles that fit into these two syntheses: *the avant-garde historian* who transforms the *aporia* between the "destructionist" and the "constructer" into

[3] The distinction of "pastoral" and "counterpastoral" interpretations of Modernity used by Marshall Berman to evaluate the works of Charles Baudelaire. Marshall Berman, *All That Is Solid Melts into Air: The Experience of Modernity* (London: Verso, 1985[1982]), pp. 134-141. For the "decadent" interpretation of Modernity see also, Matei Calinescu, *Five Faces of Modernity; Modernism, Avant-Garde, Decadence, Kitsch, Postmodernism* (Durham: Duke Uni. Pr., 1999[1977]), esp. chapter 3: "The Idea of Decadence", pp. 149-221.

a *stasis*,[4] and *the mediator historian* who aims at unifying the different realms in order to constitute the propagandist discourse of the "new tradition."

Intertwining both the avant-garde and mediator roles within the historian identity of himself, Giedion's generative historiographic model derived from art history for architecture and in order to justify this model, the scientific footings and persuasion mechanisms he has constructed, are all deciphered to constitute one of the fundamental paths of this study.

This dissertation aims to scrutinize the "Space-time" conception invented by Giedion, while analyzing the concepts of space and time separately, which this conception has been unified. In line with this target, the dissertation comprises three chapters as "Space," "Time" and "Space-time."

In Chapter Two, the role the idea of space in the 19th century German architectural thought has played in Giedion's programmatic historiography as well as the role of characterization and formulation of the changing relationship between the mobile subject and object as Space-time have been reviewed. Within the German intellectual tradition, such theoreticians as Schmarsow, Hildebrand, Frankl, Riegl and Wölfflin have been influential upon reception of the idea of space, which has been developed within the

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[4] Unlike the concept of synthesis, *Stasis* expresses a state of stagnation where the dialectic structure of *Aporia* is done away with and does not naturally involve any creative activity within. In a point of *stasis* artistically and spiritually cannot develop any new creative activity.

"This situation in regard to the arts has been perceptively described in Leonard Meyer's *Music, the Arts, and Ideas* (the chapter entitled 'History, Stasis, and Change'). History, the author argues, is a 'hierarchic construct,' and periodization—'more than a convenient way of dividing up the past'—is a necessary consequence of the graded character of history, which would become incomprehensible 'were it not hierarchically articulated into reigns, epochs, style, periods, movements and the like... .'

But such an approach would be inappropriate insofar as our time is concerned. The arts today are characterized, Meyer believes, by a 'fluctuating steady-state.' Change is everywhere but we live, culturally, in a perfectly static world. The contradiction is only apparent, for stasis 'is not the absence of novelty and change—a total quiescence—but rather the absence of ordered sequential change. Like molecules rushing about haphazardly in a Brownian movement, a culture bustling with activity and change may nevertheless he static.'

This statis appears to me as one consequence of the irreducible contradictions involved in modernity's concept of time. Such contradictions have been self-consciously exaggerated by the avant-garde, which has endeavored to bring every single art form to the point of deepest crisis. In this process, both modernity and the avant-garde have displayed an extraordinary imagination of crisis; and they have jointly succeeded in creating a complex, often ironic and self-ironic sensitivity for crisis, which seems to be both their ultimate achievement and their nemesis." Calinescu, *ibid*., p. 147.

framework of psychology, physiognomy and perception theories, as architectural space. Giedion is influenced by the German idealism he has been raised up within and the tradition of 19th century German architectural space conception under the art history training by his mentor Wölfflin. Giedion transforms the characteristics of the movement involved by the idea of space which is conceptualized by theories of visual perception since the 19th century into the 20th century architecture as the new space conception. This transformation process is discussed under three sub-headings in Chapter Two. Firstly, the development of the idea of space under the tradition of German architectural thought, secondly the impacts of this tradition upon Giedion's intellectual formation, and finally, the way Giedion has transformed this inherited conceptualizations and traditions into the modern space conception are examined.

In Chapter Three, in context of the reception of Time regarded by Giedion as one of the most important characteristics of modern space, the theorizations of the Time concept have been reviewed within a wide range from 18th century understanding of Time getting popular as the "fourth dimension" to the first quarter of the 20th century during which the avant-gardist artists have been interested on non-Euclidean geometry and Einstein's Relativity Theory.

This myth of formation of the "Space-Time" is discussed under three sub-headings in Chapter Three. Firstly, popularization of the Time conception as "fourth dimension" is scrutinized through pseudo-scientific literature in 19th century under the effect of the idea of higher reality. Secondly, re-formation process of the popular "fourth dimension" as multi-dimensionality by the avant-garde discourses in painting in the first three decades of the 20th century is examined. Finally, transposition of "Space-Time" idea under the effect of Einstein's General Theory of Relativity into architectural realm as the source of non-Euclidean geometry and all are reviewed as the impacts of formulation of Giedion's mentality.

In 19th century fantastic literature where the theme of "traveling in time" was popular, the universe has been depicted as multi-dimensional and Time has been presented as its "Fourth Dimension." The visual perception theories since the 19th century, the search for transfer of "realities" from a higher dimension to two-dimensional pictorial space,

Futurism's theoretical and practical works on concepts of movement and speed, and the relationships between space and time as established by such artists like Van Doesburg or Lissitzky in the field of art, all constitute the diversity of allusion and plurality of meaning embodied by the concept of Time during its transfer to the field of architecture. The concept within theoretical discourses in architecture through unification of the space concept and Relativity theory is accepted and popularized by Sigfried Giedion's book *Space, Time and Architecture* (1941), dated from 1938-39 at Harvard University consisting of the notes of Charles Elliot Norton lectures which could not be received well at that time.[5]

At the beginning of the 20th century, the model of universe is re-theorized thanks to the development in the field of mathematics called as "non-Euclidean geometry" and to the

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[5] "...one of the students at Harvard, H. Seymour Howard Jr., reviewing the book [*S.T.A.*] in the student journal *Task,* recalled that:

> 'A large proportion of the students from the Harvard School of Design went regularly and were stimulated by his aesthetic sense, which he was able to share with his audience. But they were also puzzled and bewildered by his theory and by his historical approach. An unmistakably metaphysical air permeated his thought.
>
> The wealth of factual material which Dr. Giedion presented so overwhelmed his listeners, however, that many felt that further study on their part would clarify his ideas or them. The publication of this book has permitted this study. Unfortunately, the bewilderment remains; the metaphysical worm still eats out the heart of the apple.'

Howard's strident and positivist critique turned on two points: a disappointment that Giedion simply asserted vague parallels between architecture, industry, theory and social needs without explaining their relationship in specific historical terms and without 'a few exalt pies of laboratory and drafting-board techniques' that might serve to guide students; and a concern that Giedion's insistence on creative intuition emerging from the unknown precluded him from clearly stating "the fundamental problems of today" and 'the methods by which they can and will be solved.'*

(...) Giedion replied to Howard's 'purely materialistic attitude' by amplifying his case that 'the influence of feeling is often regarded as unimportant, but inevitably permeates the decisions of men.' While he acknowledged an affinity between Howard's views and the 'pure functionalism' of the late 1920s in Europe, he warned against this for risking 'a belated imitation of certain European formulas' that had ignored the emotional demands of the people just when in Europe 'questions far beyond the purely materialistic have become decisive.' Giedion suggested that, in the final instance, it was the irrational that governed:

> 'It is not so easy to find an expression today for things which cannot be explained by materialistic reasons only.
>
> There is something that appears suddenly in the logical analysis! The irrational. It cannot be explained exactly and governs, nevertheless, the decision whether a building will be accepted or not by public opinion.... It may be that an architectonic conception which is moved only by the help of an all too circumscribed materialistic comprehension of the world leads just to solutions from the clouds.'[§] "

* H. Seymour Howard Jr., "Review *of Space, Time and Architecture,* by Sigfried Giedion," *Task* 2 (1941), pp. 37-38. § Sigfried Giedion, "To the Editors of Task," *Task* 2 (1941), pp. 38-39. Quoted by Detlef Mertins, "System and Freedom; Sigfried Giedion, Emil Kaufmann, and the Constitution of

concepts of “relativity” and “space-time” of the newly-developing Relativity theories in physics. This developments cause non-Euclidean geometry and Relativity theories to get intertwined with each other in daily life and concepts to be used as substitutes of one another but with different meanings. The reason underlying the interest of Futurists and Cubists in non-Euclidean geometry is that they regard the perception of the “immobile” Subject offering one-point perspective as a product of Euclidean geometry and wish to escape from this authoritarian representation. With the effect of visual perception theories that have been influential throughout the European continent at the end of the 19th century, non-Euclidean geometry is perceived not merely as a mathematical theory, but rather as a source to produce alternatives to the Euclidean geometry and exceed the existing theories of perception. Although non-Euclidean geometry implies that the one-pointed perspective can be surpassed, is thought to be impossible to construct a “multi-pointed view” by its own.

The developments in Relativity theories are put on the agenda of art and architecture to overcome this deficiency. The contribution of Relativity theories takes place on two grounds. On the first ground, relativity is interpreted as being devoid of any stability. In this respect, it has been possible to speak of mobile and multipoint views of perspective that overcome the authoritarian and one-pointed view of the static subject. As the second ground, the concept of “Space-Time Continuum” invented by Einstein to formulate the mechanism of the universe, interlocks space and time as inseparable characteristics. This integrated concept implies that space is temporal as much as spatial and both have relative nature.

By this way, this integration provides for the theoretical and scientific footing of temporality and displacement required for multi-point views moving in space. In this respect, “a-perspectival view” and the concept of time that are required for the multi-point view dependent upon movement to express the new perception theory are produced via non-Euclidean geometry and Relativity theories. Owing to this widely accepted background, Giedion is not reluctant to make use of different and occasionally conflicting time conceptions together in the field of architecture.

Architectural Modernity”, in *Autonomy and Ideology; Positioning an Avant-Garde in America*, Robert

In Chapter Four, the way Giedion constructs his "Space-time" concept as his "Great Synthesis" is scrutinized. In his first major work *Building in France, Building in Iron, Building in Ferro-Concrete*[6] (1928) he makes the first formulation of modern space conception called as "new space." On the other hand, having been influenced by works of Le Corbusier, he suggests for the movement of the subject to provide for a-perspectival view and then transforms the conventional subject-object relationship. At the beginning of the 20th century, the major path of the widespread discussions over "collage" and "montage" in Cubist painting and film theories is the problematic and varied relationship between the object and the subject perceiving it. The integrated "Space-Time" concept of Relativity theories taken as a model for Modern architectural space necessitating architectural object to be temporal as much as spatial. However, the only thing that is temporal in modern architectural space shaped by perception theories is the process through which it is experienced. In this sense, rather than the object, temporality belongs to the one who receives necessitating the object, i.e., to the subject.[7] Thus, referred by Le Corbusier as *Promenade Architecture*, where the subject can be able to "perceive" only by means of

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Somol, ed., (New York: Monacelli Pr., 1997), pp. 214-231.

[6] Sigfried Giedion, *Bauen in Frankreich, Bauen in Eisen, Bauen in Eisenbeton*, (Leipzig: Klinkhardt & Biermann, 1928). Translated as *Building in France, Building in Iron, Building in Ferro-Concrete*, trans. J. Duncan Berry, intro. Sokratis Georgiadis (Santa Monica: The Getty Center for the Study of the History of Art and the Humanities, 1995).

[7] Despite its differing content in fields of sociology, philosophy and physics, the concept of time is theorized under two categories in line with Kantian point of view: objective time (*a priori*) understanding used by such fields as physics and mathematics and subjective time (*a posteriori*) understanding used by social sciences. Within the *a posteriori* time understanding, the concept belongs to the perceiving subject who perceives the object, rather than the object itself. In such a case, the pre-modern space itself has also similar characteristics with modern space where their temporalities are dependent upon perception of the modern individual.

According to Norbert Elias, the concept of time that has been invented for establishing the societal order is a socially constructed "symbol of change" accepted via reconciliation. Norbert Elias, *Über Die Zeit*, (Frankfurt am Main: Suhrkamp Verlag, 1988) Translated in English as *Time, An Essay*, (London: Blackwell Pub., 1992) For the social construction of the time concept, see David Harvey, *The Postmodern Condition*, (London: Blackwell Pub., 1989) For another work on the "anthropomorphic" structure of the concept, see also İlhan Tekeli, "Anytime as an Interpretation of Time and Its Prospects for Reflections on the Future," in *Anytime*, Cynthia C. Davidson, ed., (Cambridge, Mass.: The M.I.T. Press, 1999), pp. 234-240.

The efforts of Giedion and others to implant the time conception which is set as *a priori* in the fields of art and architecture, involves all the problems frequently seen in concept transfers between science and art. As a result of this relation, the concept is torn away from its content and context to be re-conceptualized to encounter the expectations of the new field it has been implanted.

moving within and around, the thing that differs modern space conception from the previous space conceptions is that the perceived image of a fragmented totality and mentally constructed. Contrarily to the previous space conception claiming that a single view from a single standpoint may avail for conceiving of the "entire" space, the modern space conception suggests the fragmented totality of the acquired images perceived movingly from multiple points of view. Accordingly, content of the "totality" concept turns into a heterogeneous accumulation comprised in togetherness of fragments rather than a singular fragment. In this perception theory, the concept of time causes the images acquired in space by the mobile beholder to be no longer diachronous and become "simultaneous."

Regarding the concept of "simultaneity" he has determined to be the main characteristic of Modernity as the origin of parallelism in between images, texts and thoughts, Giedion makes use of the concept in techniques of thinking and expression as well. Relating the "simultaneity" concept with *Zeitgeist* (sprit of the age), he provides the concept an additional field of implementation never seen before. As he assumes that everything within one period may be rendered as in relation with each other due to their common temporality, Giedion does not hesitate in relating the two independent areas as Cubist painting and architecture of the same period with each other. He does not draw back from transferring the "simultaneity" concept, which has been adopted by Cubist theorists through misreading in fields of mathematics and physics, to the field of architecture because of *Zeitgeist*.[8] In line with this point of view, he refers to the concept of "simultaneity" in order to set up parallelism between Bauhaus building and Picasso's painting *L'Arlesienne* and constructs the "Space-time" concept as an architectural terminology that includes plenty of associations.

While Giedion looks for "universal truth" on the one hand, he tries to find the objective criteria to render the new architecture he has proposed, as "self-evident" and "self-

[8] "Giedion's version of Modernism, which he elaborates in *Space, Time and Architecture* (1941), has little to do with the liberated or enslaved self that we find sociologically analysed in Weber or philosophically in Heidegger. He is more concerned with new technology, which is described as being in tune with its time, and hence Modernist, which he justifies through the theory of the *Zeitgeist*." Royston Landau, "The History of Modern Architecture That Still Needs To Be Written", *AA Files*, no. 21, (Spring 1991), p. 51.

conscious,"[9] on the other. He presents *Zeitgeist* as an indisputable reality that has received common assent, i.e., as a "self-evident" objective criterion. However, he "discovers" the unsettled characteristics of *Zeitgeist* as 'constituent facts' by himself. Giedion thinks that those scientific and theoretical discoveries that aid in realizing the reality and shape the contemporary feelings render spatial organization as being objective. That is the reason of referring to optical findings, non-Euclidean geometry and Relativity theories for him while rendering the proposed modern space conception as objective. With the claim that these theories reflect the spirit of the age and naturally influence architecture, Giedion formulates the new space conception in line with these theories. In this manner, though it is not science, architecture becomes scientific and objective; and the modern space conception, an indisputable objective reality.

"Ambiguity" providing such flexible circumstances which is open to interpretation that is supporting a sphere of movement for every Modern who tries to transform mentalities and concepts, upon which he/she constituting the power and legitimacy, can denote both the new and old. What those like Giedion who suggest new contents in place of existing concepts primarily do, is to equip concepts with allusions to transform their popular contents and let them become ambiguous to be shaped into different and customary uses. As a result of this opportunity the concept becomes instrumentalized in an ideological sense and begins to serve for different uses. From such a standpoint, Giedion uses not only the concept of time, but all concepts to be in serve of unified living models he has suggested in such a diversified way to imply rather distant meanings from its literal meaning and even in a way that are conflicting with each other occasionally. As much as those concepts that are

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[9] "We intend to see **how our period has come to consciousness of itself in one field, architecture**. To do this we must understand **the architectural inheritance of our period**, the knowledge which had been **continuously evolved** in the preceding periods. These periods do not have to be examined in their entirety. **We shall touch lightly on space conception — the enveloping force of all architecture —** and note how the early Renaissance was absorbed in a passion for the newly discovered **optical perspective**, which in the late baroque led to a **new boldness and flexibility in space conception**." Giedion, S.T.A., p. 23. Emphases are added.

"Our interest is confined to the reflection in architecture of the process by which **the period has moved toward self-consciousness.** We shall follow the development to that point when **architecture achieves a clear mastery of means of expression natural to our time**. **This point was reached before 1930**, and we shall attempt to observe its subsequent development." Giedion, S.T.A., pp. 26-27. Emphases are added.

instrumentalized to the extent that they become flexible, the images, texts and paragraphs are also torn away not from their associations, but from their contexts to be brought together for re-consideration by the reader. In his strategy of the elastic deformation of the meaning, Giedion benefits from two metaphoric methods: Analogy and Parallelism. The difference between analogy and parallelism comprises directness of the relationship to be constructed between the subjects of comparison. While the connection between the phenomena are *direct* in analogy, the same relationship in parallelism is left for interpretation of the beholder via placement as side-by-side or via horizontal or vertical links established; i.e., in parallelism, there will be a more *indirect* and metaphorical substitution relationship, with an expectation of a relationship to be constructed.

In *B.F.B.I.B.F.*, the methodology of analogy he has established between images is directly constructed by the author with a massive black arrow drawn between two building images. As for *S.T.A.*, a transition takes place from analogy to parallelism. Lack of any sign required for an *obligatory* relationship to be established for changes in image characteristics (building-painting, building-sculpture, building-building... etc.) on the one hand, and for images themselves on the other, creates an expectation that the relationship will be constructed through the reader's interpretation. To the extent that he passes from the technique of analogy to parallelism, Giedion creates such flexibility that takes its departure point from the readers' power of interpretation. At this point, as diffused into his historian identity, *Telos* seems to have been reflected to his books as well. In the book *B.F.B.I.B.F.* he has written in 1928, in order to present newness (in terms of material: ferro-concrete; in terms of technique: iron structure; and, in terms of space: *Durchdringung* — Interpenetration) he will be denoting as the origin of modern architecture, in other words, in order to point out to the *modern* one, he does not render concepts as flexible yet, but in order to indicate newness, he constructs analogies between equivalent phenomena like Building-Building (Figures.1.1 and 1.2).

An analysis of Giedion's books reveals that his narrative addressing to newness in *B.F.B.I.B.F.* (1928) turns into a persuasion mechanism and a discourse that is ideological as much as flexible in *S.T.A.* (1941).

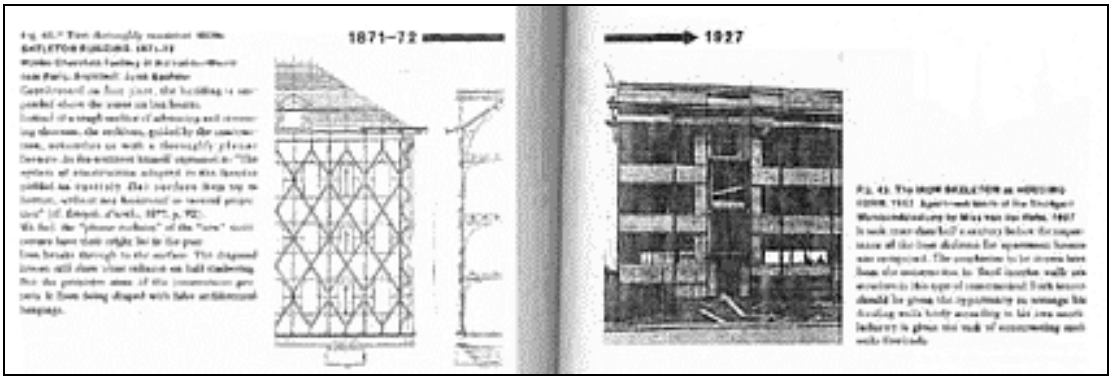

Fig. 1.1. The analogical interrelation gets beyond just placing side-by-side, but is reinforced with a massive black arrow also as an expression of progressive-linear historical continuity. From *Building in France*, Sigfried Giedion, (1995 [1928]), pp. 130-131, Fig. 40 and 42.

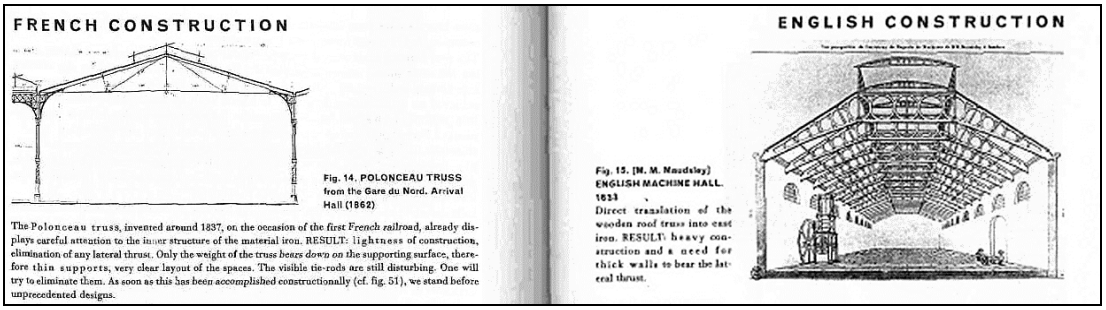

Fig. 1.2. Parallelism: Mental construction of the relationship via side by side placement. From *Building in France*, Sigfried Giedion, (1995 [1928]), pp. 110-111, Fig. 14 and 15.

In his book *S.T.A.*, where he attempts to define Modern architecture, concept of modern space, modern individual and the modern gaze as the individual's way of perception, Giedion gives priority to parallelism rather than analogy and lets the existing concepts become ambiguous. Evaluating plenty of concepts and writing techniques he has used to constitute "modern space" amounting to the main issue of his discourse also in his "opus magnum" *S.T.A.*, he does not return to the same evaluation in his other books to follow. In terms of describing and circumscribing Modernism as the Unity, the place of *S.T.A.* in

Giedion's biography is distinctive.[10] As his purpose in *Mechanization Takes Command*[11](1948) and his later works has been to extend the modern space concept to the sphere of everyday life, he reduces the level in transforming contents of concepts and also gives up using such instrumental and supplementary concepts as "Space-time."[12] In *S.T.A.*, Giedion tries to render the parallelisms of a wide range and the meanings of concepts as multiple since his purpose has been to renew and to transform concepts belonging to Modernity. In this respect, the concept of Space-time attains a structure of multiple meanings referring to different fields from rhythm of Modern life to Einstein's Relativity theory, from collage technique of Cubist painting he has interpreted as simultaneous perception to Bergsonian *durée,* and even to the conception of "Living History" he has invented.

He makes use of similar ways of connection in his writing technique as well. In his narrative, he successively lists unrelated or unconnected sentences or paragraph fragments one after the other. With the help of such parallelism he has realized, he develops a method to acquire meta-meanings dependent upon associations;

> "The backward look transforms its object; every spectator at every period— at every moment, indeed —inevitably transforms the past according to his own nature: **Absolute points of reference** are no more open to the **historian** than they are to the **physicist**; **both** produce descriptions' **relative** to a particular situation.

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[10] Giedion's book *S.T.A.* which continuously updates Modernism and also more explicitly defines its boundaries in each new edition, can be regarded as the most integrated book and "project" within the historiography of architectural Modernity.

[11] Sigfried Giedion, *Mechanization Takes Command*, (New York: Oxford Uni. Pr., 1955 [1948])

[12] He also uses the Space-time concept in his work *Walter Gropius* he has written on order in 1954. However the use of the ' concept' here is to define *S.T.A.* and the Space-time discourse :

"As has already been described in '*Space, Time, and Architecture*' this is an expression in terms of architecture of the same abandonment of the single viewpoint of the Renaissance that had already occurred in painting: in Picasso's Arlésienne (1911-12) the head is shown simultaneously full face and in profile.

The Bauhaus complex has no definite frontal façade. The interplay of transparency and the piercing of space by bridges leads to an interpenetration of horizontal and vertical planes that makes it impossible to grasp the whole of the complex from any single viewpoint, and results in an unprecedented effect of simultaneity that accords with the **space-time** conception." Sigfried Giedion, *Walter Gropius*, (New York: Dover Publ., 1992 [1954]), p. 24. Emphasis is added.

> Likewise there are no **absolute** standards in the arts: the nineteenth-century **painters and architects** who thought certain forms were valid for every age were mistaken. **History cannot be touched without changing it**."[13]

Sometimes, he does not draw back from constructing analogies between irrelevant cases of different characteristics as well.

> "Around 1910 an event of decisive importance occurred: the discovery of a new space conception in the arts. Working in their **studios as though** in **laboratories**, painters and sculptors investigated the ways in which space, volumes, and materials existed for feeling."[14]

> "In the architecture of the time the trend toward an **individualistic isolation of rooms** from each other was nowhere so strongly marked as it was in Germany — in the work of K. F. Schinkel, for example. This was the true **architectural equivalent** of the **individualism of the romantic poets**."[15]

Giedion's superficial and formalistic ways of establishing relation he has used in his paragraphs and in captions of the figures also aid in bringing together the uses of the same concept in different contexts. According to this spirit of establishing relation Giedion has designed as an *obligation* because of carrying the spirit of the same age (*Zeitgeist*), Degas's "Dancer" painting and Galerie des Machines are regarded as similar due to their "impersonal, precise, and objective spirit" characteristics. In a similar manner using the concepts "transparency of overlapping planes" and "simultaneity" to legitimate the "Space-time" concept, Giedion renders the glazed façade of Walter Gropius's Bauhaus building at Dessau as parallel to Picasso's *L'Arlésienne* painting (Figures 1.3, 1.4, 1.5, 1.6, 1.7 and 1.8). As an extreme example for establishment of meaning and relationships by the readers, he makes use of the most flexible form of parallelism as a persuasion instrument: unlike the other historians of his era like Panofsky, Giedion does not use references and thus, he uses

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[13] Giedion, *S.T.A.*, p. 5. Emphases are added.

[14] Giedion, *S.T.A.*, p. 26. Emphases are added.

[15] Giedion, *S.T.A.*, p. 7. Emphases are added.

those statements that imply uncertain, undefined, general, current and common events such as “everybody knows…,” “On every hand we hear…” etc. For this reason, by using this technique, he begins to justify the “remarks and intuitions” that he cannot give any scientific references or footings. He takes his departure point from the presupposition that the readers of his era can acknowledge these remarks and intuitions. Naturally here an indefinite circumstance takes place open to interpretation of the reader. Straining the generalizing conditions of the literary language, he begins to speak in plural personal pronoun mode. There exists no answer to the question “Does everyone really know?” that might rise up in reader’s mind. In this respect, Giedion leaves no other alternative to the reader other than trusting him. His persuasiveness departs from this point of ambiguity; to let the reader get into a psychology “known by all, but not the reader” and by means of this, to construct the presuppositions that will render his own intuitions as persuasive.

> “In the great architectural masterpieces, as in every great work of art, the human shortcomings which every period exhibits so liberally fall away. This is why these works are true monuments of their epochs; with the overlay of **recurrent human weaknesses** removed, the central drives of the time of their creation show plainly.”[16]

> “Today the urge toward such universality is deeply **felt by everyone**. It is the reaction against a whole century spent in living from day to day. What **we see around us** is the reckoning that this shortsightedness has piled up.”[17]

> “**Everybody knows that** we have far more means of bringing change under farsighted control than any of the peoples of earlier times. It is the new potentialities at our disposal which are the key to a new and balanced life for enormous numbers of men.**”**[18]

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[16] Giedion, *S.T.A.*, p. 20. Emphases are added.

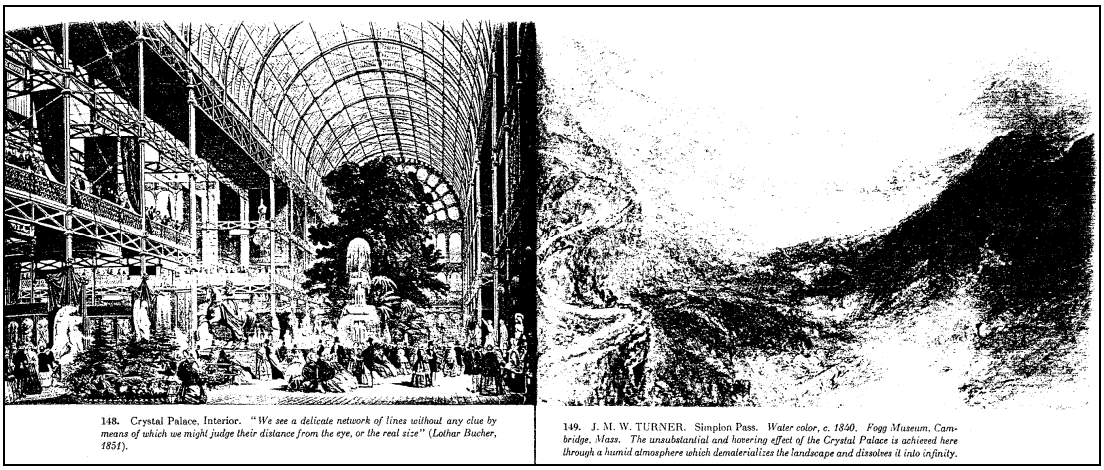
[17] Giedion, *S.T.A.*, p. 7. Emphases are added.

[18] Giedion, *S.T.A.*, p. 8. Emphases are added.

> "It is beside the point whether or not this route is more difficult, more precarious, and less certain to end in success than the path that lay open to Leibnitz. It is the route that present realities **force us to take**."[19]

Another method Giedion utilizes of persuasion is to produce a negative future scenario to take place on the condition that his thoughts are not realized. In this manner, he undertakes a messiah role and produces imaginary scenarios to strengthen self position for an unanticipated circumstance in which no single definite opinion of the reader is acquired:

> "It is just such an evolution which lies behind the doubt as to whether science and art have anything in common. The question would not be raised except in a period where thinking and feeling proceed on different levels in opposition to each other. **In such a period, people no longer expect** a scientific discovery to have any repercussions in the realm of feeling."[20]



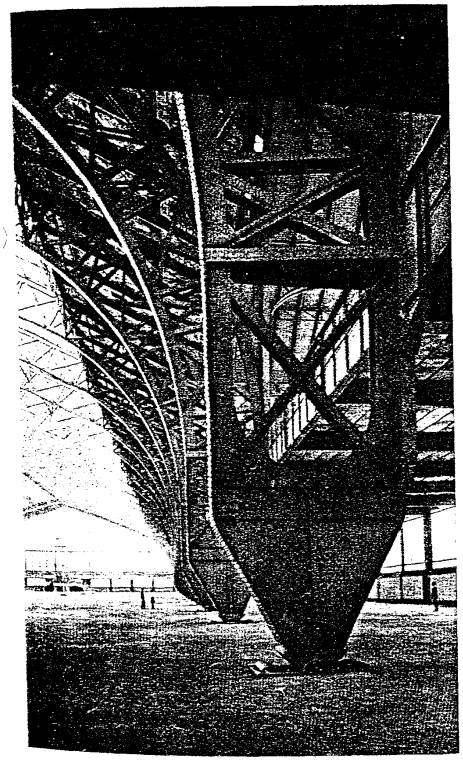
148. Crystal Palace, Interior. *"We see a delicate network of lines without any clue by means of which we might judge their distance from the eye, or the real size"* (*Lothar Bucher, 1851*).

149. J. M. W. TURNER. Simplon Pass. *Water color, c. 1840. Fogg Museum, Cambridge, Mass. The unsubstantial and hovering effect of the Crystal Palace is achieved here through a humid atmosphere which dematerializes the landscape and dissolves it into infinity.*

Fig. 1.3. Parallelism as the associative connection of *Zeitgeist*. Pages 256 and 257 of *Space, Time and Architecture* (1967) comparing the immaterial effect of the interior image of the Crystal Palace of 1851 and J. M. W. Turner's painting "Simplon Pass" of 1840. The accompanying text for "Salmon Pass" reads: "The **unsubstantial** and hovering effect of the Crystal Palace is achieved here through a humid atmosphere which **dematerializes** the landscape and dissolves it into infinity." From *S.T.A.*, Sigfried Giedion, (1967), pp. 256-257, Fig. 148 and 149. Emphases are added.

[19] Giedion, *S.T.A.*, p. 17. Emphases are added.

[20] Giedion, *S.T.A.*, pp. 12-13. Emphases are added.



161. International Exhibition, Paris, 1889. *Base of three-hinged arch.*

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162. EDGAR DEGAS. "The Dancer." *Degas, the most daring experimentalist among the painters of the period and the exact contemporary of Eiffel, projects his dancers stripped of all erotic façade. He shows their distended nostrils and all the tenseness of straining effort. Max Liebermann remarks (in "Pan," the most "precious" of the German avant-garde reviews, p. 195) that "he seems to disguise his models and to see the nascent prostitute in the young dancer: no other painter has so completely subdued the novelistic element." This painting exhibits in its field the impersonal, precise, and objective spirit which produced constructions like the Galerie des Machines.*

Construction moves unconsciously toward new aesthetic feelings

It is precisely the features that are criticized which pointed to later developments. Here construction is unconsciously moving toward aesthetic feelings which did not find their equivalents in art and architecture until decades later.

In this hall the light pouring in from above swallowed up the thin latticework. So far as the optical impression is concerned. the vault attains a floating or hovering state.

The last hint of the antique column has disappeared. It is impossible to separate load and support.

Bent as though in the act of leaping, the vaulting starts at a very low level to take up its load. If we wish, we may regard this vaulting as our equivalent of the caryatid. It does not

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Fig. 1.4. Constructing formalistic parallelism between the pin-joint of the Galerie des Machines and the posture of the ballerina on ballet slipper in Edgar Degas's painting "Dancer." Giedion's accompanying text reads: "Degas, the most daring experimentalist among the painters of the period and **the exact contemporary** of Eiffel, projects his dancers stripped of all erotic façade. (...) This painting exhibits in its field **the impersonal, precise, and objective spirit** which produced constructions **like** the Galerie des Machines." From S.T.A., Sigfried Giedion, (1967), pp. 272-273, Fig. 161 and 162. Emphases are added.

Now, in our day, when the transition between inner and outer space can be completely effected, it is no wonder that projects appear which spring from the same spirit as that toward which Borromini groped. A clear expression of the same kind of feeling appears in a monument projected by the Russian constructivist painter, Tatlin, in 1920. Like Borromini, he employed the spiral form, with its inherent movement (*fig.* **52**).

Relation to our period

Borromini, like most of the great baroque artists in Rome, came from the far north of Italy. He began as a stonemason employed in the work on St. Peter's. This was his calling for many years, and throughout his life he remained in personal contact with the actual working of materials. But he was also a sculptor, and one of the greatest of the baroque age, although he produced neither brilliant portrait busts nor figures of saints melting away in mystical-erotic ecstasy. Indeed, he did no sculpture at all in the normal sense of the word. He expressed himself — like some modern masters — in abstract spirals, in the wire sculptures on the tops of his churches. But he was, above all, a sculptor of buildings, expressing himself

Borromini as a sculptor

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49. FRANCESCO BORROMINI. Sant' Ivo, Rome. Interior of dome. *The continuous inner surface of the dome is broken up. It is made to transmit the movement which runs throughout the whole elevation.*

50. PICASSO. Head. Sculpture, c. 1910. *Borromini's intersection of the continuous inner surface of the dome must have had the same stunning effect upon his contemporaries that Picasso's disintegration of the human face produced.*

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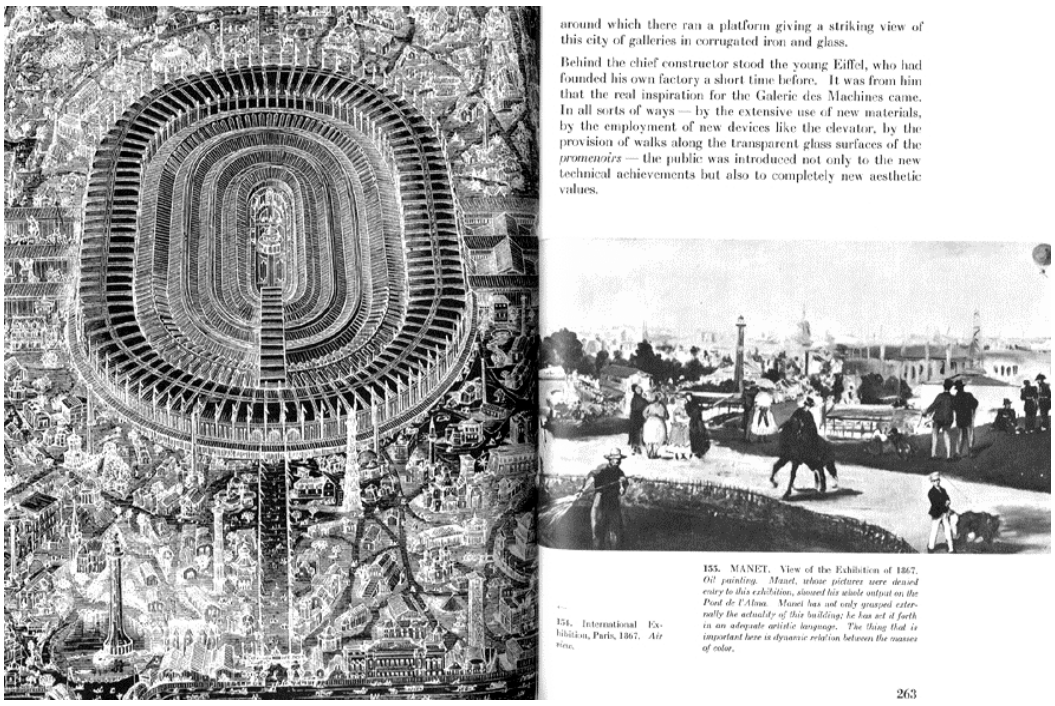
Figure 1.5 Parallelism between an interior photograph of Francesco Borromini's cuppola of Sant'Ivo in Rome of 1642-1662 and a photograph of Pablo Picasso's sculpture *Head* of 1910. The text accompanying for the figure of Picasso's *Head* reads, "Borromini's intersection of the continuous inner surface of the dome must have had **the same stunning effect** upon his contemporaries that Picasso's disintegration of the human face produced." From S.T.A., Sigfried Giedion, (1967), pp. 116 -117. Fig. 49, 50. Emphases are added.



around which there ran a platform giving a striking view of this city of galleries in corrugated iron and glass.

Behind the chief constructor stood the young Eiffel, who had founded his own factory a short time before. It was from him that the real inspiration for the Galerie des Machines came. In all sorts of ways — by the extensive use of new materials, by the employment of new devices like the elevator, by the provision of walks along the transparent glass surfaces of the *promenoirs* — the public was introduced not only to the new technical achievements but also to completely new aesthetic values.

154. International Exhibition, Paris, 1867. *Air view.*

155. MANET. View of the Exhibition of 1867. *Oil painting. Manet, whose pictures were denied entry to this exhibition, showed his whole output on the Pont de l'Alma. Manet has not only grasped externally the actuality of this building; he has set it forth in an adequate artistic language. The thing that is important here is dynamic relation between the masses of color.*

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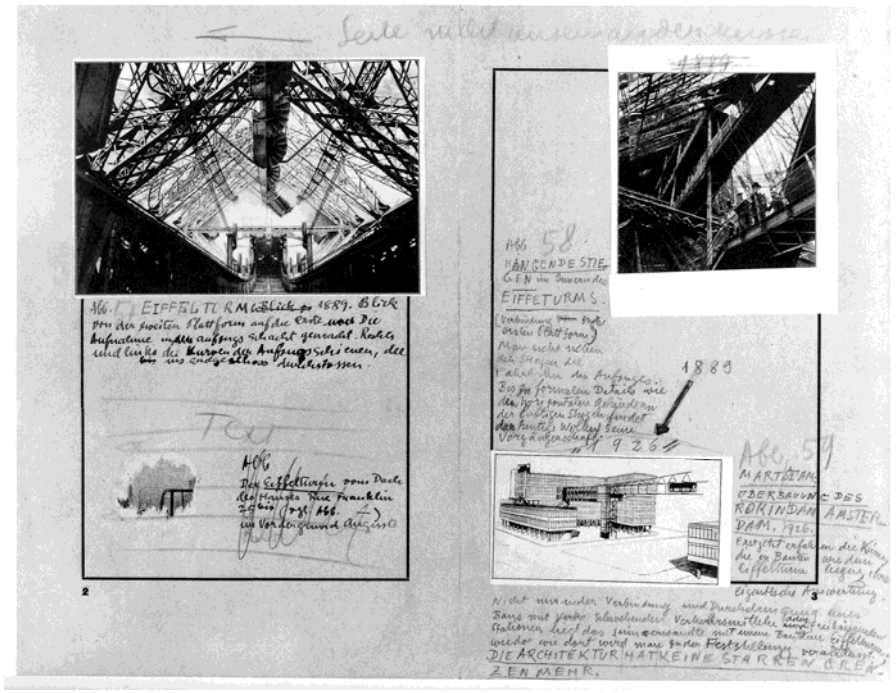
Figure 1.6 Comparing "the dynamic relation" of the International Exhibition Building in Paris of 1867 and Edouard Manet's painting of 1867. Giedion's accompanying text reads, "Manet, whose pictures were denied entry to this exhibition, showed his whole output on the Pont de l'Alma. Manet has not only grasped externally the actuality of this building; he has set it forth in an adequate artistic language. The thing that is important here is dynamic relation between the masses of color." From S.T.A., Sigfried Giedion, (1967), pp. 262-263. Fig. 154, 155.

Figure 1.7 Comparing "the penetrative affect of the spiral movement" of an exterior photograph of Francesco Borromini's cuppola of Sant'Ivo in Rome of 1642-1662 and Vladimir Tatlin's illustration of a monument for the Third International in Moscow of 1920. The text accompanying for Sant'Ivo reads, "Lantern with coupled columns and spiral. **Culminating point for the movement that penetrates the whole design**." And the text accompanying for Tatlin's monument reads, "This, **like** Eiffel Tower and some other monuments of our time, is a contemporary realization of the urge toward **the interpenetration of inner and outer space**." From *S.T.A.*, Sigfried Giedion, (1967), pp. 118-119. Fig. 51, 52.



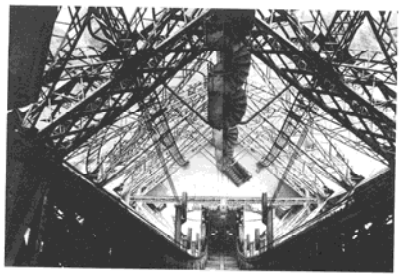


Fig. 57. EIFFEL TOWER 1889
View from the second platform to the first. Taken from inside the elevator shaft. Right and left the curved elevator rails that continue down to the ground floor.

One might also view the Eiffel Tower as a manifesto: the successful realization of a 300-meter-high structure provided the decisive impetus for tall steel-skeleton buildings.

This development continued underground: America. The question of who built the first skyscraper is still being disputed. We know only that in Chicago—apparently at the same time as the Eiffel Tower—quite a number of architects started building the first eleven- or twelve-story steel-framed houses.[69]

In Paris itself—quite apart from department stores—a series of modest skeleton structures with iron facades was erected in the following decade.

An entire square was even placed on an iron foundation. It was the place de l'Europe, the generous structure over the wide network of rail lines from the Saint-Lazare Station. (Engineer: Julien). With a half-dozen intersecting streets.

The tradition of the nineteenth century is today being renewed. Many efforts in

[69] "Who Designed the First Steel Skyscraper?," *The Western Architect* 32 (November 1923), p. 125. It is mentioned that the architects were [John] Root, [Dankmar] Adler and [Louis] Sullivan, [William Le Baron] Jenney, [William] Holabird, and [Martin] Roche in Chicago as well as L. [Case] Gilbert (eleven-story Tower Building) in New York.

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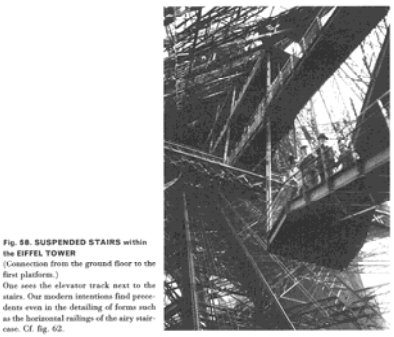

Fig. 58. SUSPENDED STAIRS within the EIFFEL TOWER
(Connection from the ground floor to the first platform.)
One sees the elevator track next to the stairs. Our modern intentions find precedents even in the detailing of forms such as the horizontal railings of the airy staircase. Cf. fig. 62.

1889

1926

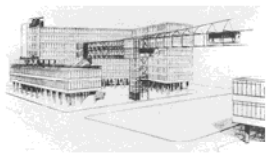

Fig. 59. MART STAM: SUPERSTRUCTURE OF THE ROKIN DAM AMSTERDAM 1926
Only now do the seeds that lie in structures such as the Eiffel Tower come to full fruition. The affinity with a building such as the Eiffel Tower lies not merely in the connection and interpenetration by suspended transportation or free-hanging stations: one reaches the conclusion viewing both buildings: ARCHITECTURE NO LONGER HAS RIGID BOUNDARIES.

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Figure 1.8 The analogy between suspended stairs of the Eiffel Tower of 1889 and Mart Stam's Superstructure of 1926 in published and the original designs of the page layout of the pages 144 and 145. From *B.F.B.I.B.F.*, Sigfried Giedion, (1995), pp. 144-145.

In his book *S.T.A.* written in 1941, he re-considers those newnesses that he has mentioned in his previous book in order to describe the "modern architecture." While his concern has been on modern architecture seen on surface and its ontological bases, he grounds his considerations on all modernization processes and the condition of Modernity, which he profoundly and hiddenly perceives as mechanization. In order to make Modern architecture apparent and to describe the modern individual to perceive and experience it, he tries to make every concept ambiguous from ethics to aesthetics and from consciousness to creativity. While this act of making ambiguous facilitates his moves to and from different references and realms on the one hand, it causes the boundaries in elasticity of deformation of the meaning to become problematic on the other. At this point, he keeps oscillating in between System and Freedom by the characteristics seen in every avant-garde. First, he organizes a system by presenting his "new" and destructive suggestions. Then he attributes flexibility to the boundaries of this system to try constructing such freedom that can be open to interpretation and valid for different circumstances. However, the layout he has constructed is hierarchical in terms of value and involves the implication that freedom can be neglected in case of any contradiction with the system. In order to overcome this dilemma, Giedion sets forth a new concept that will avail for oscillation between System and Freedom: Organism. In Giedion's opinion, organism as a concept used widespread in the 19th century, during which the relationship between biology and architecture has influenced the German intellectual milieu, points out to a boundary and at the same time, may contain open-ended and contingent circumstances.[21] According to Giedion, architecture is an organism and comprises contingency as much as autonomy.[22] Nevertheless, Giedion defines architecture within a dual structure: architecture as a

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[21] For the post-1960s adventure of this oscillation between System and Freedom, see Hashim Sarkis, "The Paradoxical Promise of Flexibility," in *Le Corbusier's Venice Hospital*, Hasim Sarkis, ed., (Munich: Prestel Verlag, 2001)

[22] "An architecture may be called into being by all sorts of external conditions, but once it appears it constitutes an **organism in itself**, with its own character and its own continuing life." Giedion, *S.T.A.*, p. 20. Emphases are added. "The fact that **we are considering architecture as an organism makes it natural for us to examine both its beginning and its end, construction and town planning."** Giedion, *S.T.A.*, p. 24. Emphases are added.

practical activity unified with life[23] and architectural historiography/literary architecture as independent from life. Giedion also adapts the metaphor of organism to this distinction he has made. In his opinion, architecture as a practical activity unified with life can be defined as "finite organism" owing to its finiteness as well as indefiniteness and variability both.[24] On the other hand, while architecture is inseparable from life, architectural historiography can be independent from life.[25] As he denotes that architectural historiography can be defined as an "independent organism," Giedion wishes to point out two points: that the historiography relatively interpreted by the historian is separate from life[26] and that historiography has a context of its own.

Finally, this dissertation aims at deciphering by which goals, ways and techniques Giedion has added the Time concept to his discourse and the field of architecture and to scrutinize the transformations in content of the concept. In line with this aim adopted, apart from *Space, Time, and Architecture* (1941), the time conceptions and differences between his first book *Building in France, Bulding in Iron, Building in Ferroconcerete* (1928) and his later book *Mechanization Takes Command* (1948) have been determined to elaborately examine Giedion's methods in considering the concept. Though an attempt to analyze Giedion's mentality in context of his multiple identities as an author, architectural historian

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[23] "We are looking for **the reflection in architecture of the progress** our own period has made toward **consciousness of itself** — of its special limitations and potentialities, needs, and aims. **Architecture can give us an insight into this process just because it is so bound up with the life of a period as a whole**." Giedion, *S.T.A.*, p. 19. Emphases are added

[24] "In the great architectural masterpieces, as in every great work of art, the human shortcomings which every period exhibits so liberally fall away. This is why these works are true monuments of their epochs; with the overlay of recurrent human weaknesses removed, the central drives of the time of their creation show plainly.

But if architecture is the result of so many conditions, is it **either proper or possible** to examine it **out of its context**, as a **finite organism** in its own right?" Giedion, *S.T.A.*, p. 20. Emphases are added.

[25] "Even though **architecture is inseparable from life as a whole**, it is still possible **to write a history of architecture** in which it is regarded as an **independent organism**." Giedion, *S.T.A.*, p. 22. Emphases are added.

[26] "The backward look transforms its object; every spectator at every period— at every moment, indeed — inevitably transforms the past according to his own nature: **Absolute points of reference are no more open to the historian than they are to the physicist**; both produce descriptions' **relative** to a particular situation." Giedion, *S.T.A.*, p. 22. Emphases are added.

and critic, secretary of the foundation CIAM, academician...etc., effort has been spent to determine his understanding of architecture and history. Through examination of the reasons why Giedion's historiographic narrative and time conception still keep their validity in the architectural milieu of our day, the study tries to figure out the roots of his convincing character and methods of persuasion. This study, which aims to excavate the Space-time concept in a way that is extending into different meanings, takes the last edition of the book in 1967 as its basis, as it provides for the most comprehensive meaning of the concept.

CHAPTER 2

SPACE

2.1 Reification, Conceptualization, and Embodiment of the Idea of Space as the Subjectified Experience in 19th century German Architectural Space Theories.

In 1922, during his education on art history in Munich, Giedion completes his dissertation titled *Spätbarocker und Romantischer Klassizismus*[27] under mentor and aegis of art historian Heinrich Wölfflin. Beginning from the 19th century, he has been influenced by the aesthetics, physiognomy, empirical psychology, Kantian philosophy and, developing perception theories of German philosophy, art and architecture; Jacob Burkhardt, Friedrich Theodor Vischer, Robert Vischer, Carl Stumpf, Adolf Hildebrand, August Schmarsow, Paul Frankl, Heinrich Wölfflin etc., have subjectified the idea of space via its reception as perception and experience. In the course of time between the mid-1920s till 1940s, owing to the multiple viewpoints of perception of the mobile observer what Giedion has tried to theorize as a new space conception, the genealogical roots of the modern space idea lie in the idea of Space that is shaped under effect of German philosophical, psychological and perception theories. In 19th century, those fields that have been influential in formation of the idea of Space in a modern manner have been the newly splintered disciplines of aesthetics, psychology, sociology, and anthropology where the effort has been directed to construct scientific footings for themselves. The new formation of idea of Space is affected by the popularity of archeology which is increased its due to new discoveries, and art which has tried to pass from subjectivity to objectivity of scientific epistemology, rather than being affected by theoretical thoughts and texts in architecture. The characteristic common to all these, is reception of the idea of Space as "the physiognomy of form" and its conceptualization in line with the theories of aesthetics, philosophy and perception. Owing to the aesthetic formalism rising with the beginning of the 19th century, the problem of form and its sensual and visual experiences have prepared a philosophical and scientific ground for the art of spatial creation.

Influencing also the works of Giedion, the transformations and upheavals, reflections of which can be traced in all social, cultural, ethical, and political fields of the 19th century, have provided for the creation of new values, resulting in critics and reactions against historicism. As an outcome of this influence, the ontological existence of art, aesthetic terrain and the issues of form and space have all been questioned starting the way to reach abstract and nonrepresentational art. Depicting the difference of aesthetical models and speculations of the 19th century from the other periods as a transition from perceptional terrain to aesthetic terrain and stating that "the erstwhile philosophical and physiological problem of how to perceive form and space in effect gave way to the fledgling psychological problem of how we come to appreciate or take delight in the characteristics of form and space," Harry Francis Mallgrave and Eleftherios Ikonomou emphasize the way aesthetic terrain renders itself as self-sufficient and construct an autonomy of its own: "Implied in this subtle but at the same time dramatic shift was the analogous problem how we might artistically exploit pure form and space as artistic entities in themselves."[28]

Emergence of the issue of the autonomy of art in modern terms dates to the second half of the 18th century during which art was understood as the sensual realm and meaning was framed to be disciplined as Aesthetics.

The German Alexander Gottlieb Baumgarten, who has given the name to aesthetics with his book *Aesthetica* written between 1750-1758 as 600 pages in Latin, pursues along the Cartesian-rationalist line of thought, which Descartes has distinguished as sensual and rational knowledge. Different from the "entire thing" which is previously unseparated dualistically and self-evident, Baumgarten renders sensual things as intelligible in context of subjectification, clarification and rationalization processes of the Cartesian thought and transforms sensual things into being comprehensible only by mind with his discipline of aesthetics.[29] Just as *cogito* attempts to explain universe by

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[27] Sigfried Giedion, *Spätbarocker und Romantischer Klassizismus*, (Munich: F. Bruckmann A.G., 1922).

[28] Harry Francis Mallgrave and Eleftherios Ikonomou, "Introduction", in *Empathy, Form, and Space: Problems in German Aesthetics, 1873-1893* (Santa Monica: The Getty Center for the History of Art and the Humanities, 1994), p. 2.

[29] As a result of separation of inseparable values of the pre-modern world into moral and aesthetic realms due to Modernity, art becomes self-referential such that it is then bound to re-produce its own values: "In classical culture, beauty was linked to the splendor of the world order, as well as to the essential apprehension of the truth of things. For western metaphysics since Aristotle, the true, the good, and

systematizing it, the sensual world that has been transformed into an artifact of the modernization process with the help of the discipline of aesthetics is rationalized within systematical self-consistency.[30] Systematization is an apparatus to embody rational thought of the modernization process. A rational system involving self-consistency as the preliminary condition for self-sufficiency and autonomy is fostered with the help of the systematization apparatus.

In Germany of the 19th century, "a common methodological footing" searched for developing a similar system finds itself paradoxically on "unscientific basis of art's critical analysis" like the newly-emerging fields of psychology or aesthetics.[31] Such methodological innovations as *Kunstwissenschaft* (Science of Art), *Grundbegriffe* (Basic Principles) can be regarded as the justification statements of this scientizing process. During this period, the major interest of Psychology has been on how the impetus of the external world has been captured and on their unconscious and reflexive acts like mimic and their expressions in physiognomy of body and subconscious. On the other hand, whereas the first one of the basic problems in 19th century German philosophy is the duality of sense-reason in the reception process of the external world,

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the beautiful have been interwoven and are therefore inseparable. In modern times, however, since Edmund Burke and Immanuel Kant, the sublime constitutes another form of aesthetic experience that is, once more, pure event: something new that, even if only for an instant, fictively produces a parallel world, a *Zwischenwelt,* as Paul Klee called it. Out of the essential indeterminacy of the conflictive and changing modern world, art opens up spaces of visual, auditory, or emotional intensity, hoping to bring about a shock, an experience stripped of references, disarmed in relation to the imitation of nature. Only the intensity of this shock guarantees the potency of the avant-garde work of art. Pure event as the result of a deliberate action." Ignasi de Solà-Morales Rubió, *Diferencias. Topografia de la Arquitectura Contemporánea*, (Barcelona: Editorial Gustavo Gili, S.A., 1995) Translated by Graham Thompson as *Differences: Topographies of Contemporary Architecture*, (Cambridge, Mass.: The M.I.T. Press, 1999), p. 103.

[30] According to this study, which interprets the Cartesian *ethos* contained by aesthetics from Luc Ferry's point of view, the self-consistency rationally formulates the *Lebenswelt*. Hakkı Hünler, *Estetik'in Kısa Tarihi; Modern Kültür ve Sanat Üzerine Felsefi Bir Tartışma* [Brief History of Aesthetics, A Philosophical Inquiry on Modern Culture and Art] (Istanbul: Paradigma Yayınları, 1998), esp. Chapter 1: Geleneğin Tahribi ve *Aesthetica*'ya Giden Yollar, [Destruction of the Tradition and the Ways Toward *Aesthetica*] pp. 43-66 and Chapter 2: Baumgarten ve *Aesthetica* [Baumgarten and *Aesthetica*], pp. 67-88.

[31] "We lose sight too easily of the fact that these diverse, even contrary tendencies were generally perceived as working together toward the same goal, and that the newly splintered disciplines of psychology, sociology, anthropology, linguistics, and aesthetics, for instance, were presumed to share a common methodological footing (Wilhelm Dilthey) — one that was at root different from that of the natural sciences. This acknowledgment of the 'unscientific' basis of art's critical analysis must in itself call into question the terminological distinctions of many of our time-honored suppositions. To regard the effort to create a *Kunstwissenschaft* merely as indicative of a larger positivist trend is to miss entirely the point of the exercise, and — more importantly — it belies the contribution such

the second one is what is recepted of the object depending on the duality of form-matter: the question of 'content' and its relevance to the appreciation of form.

Known to be one of the oldest problems of philosophy, the whole and the part attain a dual character for Aristotle sees the whole as prior to the parts. As for the second half of the 18th century, Immanuel Kant's philosophy of transcendental ideality that combines rational and sensory data consist of "pure forms of intuition" (*a priori* ideas of space and time) and "forms of thought" (categories which regulate our perceptual and conceptual structuring of the world). In *Critique of Judgement* he has written in 1790, Kant aims at reaching a new principle of aesthetic judgement by applying the transcendental philosophy to the field of aesthetics where "he hoped would provide it [a new principle] with a measure of universality and at the same time allow it to remain subjective."[32] With the new principle "purposeness without purpose"[33] he has presented as the fourth moment of Beauty, Kant transforms the definition of Beauty as well. Separating the concept of Beauty into two as ideal-dependent Beauty and concept-free Beauty, he produces "Free Beauty" that avails for "the role of imagination."[34] On the other hand, while making an aesthetic judgement, he warns us about not mixing concept and form together. In this way, Kant lets the concept of Beauty get free of its ever-existing "ideal" and objective characteristic and by rendering it as subjective and conceptual, he paves the way to 19th century aesthetic theories. While the Gestalt

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theories made to the way in which artists came to view their craft." Mallgrave and Ikonomou, *ibid,* p. 4. Italic is original.

[32] Mallgrave and Ikonomou, *ibid*, p. 6

[33] "The problem appears early in Kant's work, in his commentary on the third moment of beauty, 'purposiveness without a purpose.' Shortly after insisting that the judgement of taste is independent of the concept of utility or perfection, he distinguished between 'free' and 'dependent' beauty. The former is a pure beauty of form taking account only of the purposiveness of form; the latter is an ideal beauty adhering to a concept." Mallgrave and Ikonomou, *ibid*, p. 6. Emphases are added.

[34] "(…) Kant also stressed the role of the imagination in this aesthetic process. In this scheme, art is doubly creative: first, in the sense that the artist creates forms, lines, and planes in a sensuous medium and, second, in the sense that the person experiencing the work of art structures these sensations as forms. **Art differs from nature in that it is a 'making,' a free production**; it promotes, says Kant, 'the culture of the mental powers' in a way science or the handicrafts cannot. Artistic creation is free, and 'the purposiveness of form must appear as free from any constraint of arbitrary rules as if it were a product of mere nature.'* Although art's forms are designed, they must not appear to be designed; there must be no trace of a rule impeding or inhibiting the artist's mental powers. Kant terms the capacity or talent to produce such forms 'genius,' the mental disposition through which nature gives rule to art." Mallgrave and Ikonomou, *ibid*, p. 6. Emphases are added. *Mallgrave and Ikonomou quote from Immanuel Kant, *Kritik der Urtheilskraft* (1793), in *Immanuel Kants Werke* Benzion Kellermann, ed., (Berlin: Bruno Cassier, 1922), sec. 45, p. 381.

concept that has been introduced by the philosophical poet and romantic scientist Johann Wolfgang Goethe pursued along the subjectivity channel of Kant on the one hand,[35] with the emphasis it has placed on physiognomy, it provided a groundbreaking mentality for German philosophical issues of form in the nineteenth century, on the other. According to Mallgrave and Ikonomou, with his work titled as *Die Welt als Wille und Vorstellung* (The world as will and representation) written in between 1819-1844 as affecting the development of subjective side of the aesthetic act, Arthur Schopenhauer influences the development of nineteenth-century aesthetics in two ways:

> "(...) first, with the mental animation with which it endowed the aesthetic act of viewing and second, with the emphasis is placed on the physiological nature of perception. Such concerns also mirrored Schopenhauer's regard for aesthetic activity as a process unfolding in two stages. On the one hand, there is the assimilation of 'Platonic Ideas,' or constant forms, underlying the ever-changing reality — a will manifesting itself everywhere, from the primitive forces of magnetism and gravity to its most refined expression in human thought. On the other hand, there is the necessity for the viewing subject, in carrying out this assimilation, to suspend knowledge of the self and thereby become a pure, will-less subject of knowing. Our aesthetic consciousness becomes enhanced, for example, by 'losing ourselves' in a natural landscape or work of art. He termed such a capacity 'objectivity.'"[36]

With the emphasis he has put on the viewing subject and visual perception, Schopenhauer appears to have opened the main channel to determine form and space conceptions in the 20th century. The main purpose of Schopenhauer, who, in line with Hegelian idealism, has separated arts into two as higher and lower arts, has been to place art at a higher level than science. Within this hierarchical categorization, art is

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[35] "In Goethe's morphology, the term 'Gestalt' referred to the self-actualizing wholeness of organic forms. Goethe considered all advanced structures of a plant or an animal to be transformations from a single fundamental organ. He accounted for similarities among the members of a species by formal laws of (self-) organization, ultimately derived from an ideal type he called an *Urbild,* and attributed the differences to environmental effects. This was similar to the view of Kant and Blumenbach, for whom the functional role of an organism's parts is determined by a law inherent in the whole — **a conception of cause and effect different from that of mechanics. It was only a short step from positing self-actualizing morphotypes in the organic world to conceiving the human person also as the result of an ongoing process of self-creation, or *Bildung***. Like many of his contemporaries, Goethe enjoyed the then-popular pursuit called 'physiognomies,' originated by Johann Caspar Lavater. This involved interpreting the outlines of human facial features exhibited in silhouettes called 'shadow pictures' as expressions of the subjects' character." Mitchell G. Ash, *Gestalt Psychology in German Culture, 1890-1967; Holism and the Quest for Objectivity*; (Cambridge: Cambridge Uni. Press, 1995), pp. 85-87. Italics are original. Emphases are added.

[36] Mallgrave and Ikonomou, *ibid*, p. 9.

divided into different levels within itself: poetry and drama as "higher" arts and "lower" arts as architecture.[37]

Another thinker who has been influential in history of thought with his psychological theories during the first half of the 19th century is Johann Friedrich Herbert. Owing to his theories that have been influential in psychology and aesthetics, he has reducted the human consciousness to the continuous appearance and complicity of ideas.[38] For Herbert, the important thing is the contemplation of form. In his opinion, the architectural forms consist of "spatial counterpoints" of interlaced patterns and planes and he defines the formal relations in between as simultaneous (spatial) and successive (temporal) relations.[39] According to Herbert's formalist psychology, space is the apprehension of relations between coexisting phenomena and spatial perception is also a learned process:

> "The formation of the spatial network or grid depends on our arrangement of the ideas into images. The result is a series of associated elements, such as a composition of intersecting, converging, or parallel lines, from which we then infer the third dimension. The complex process of building spatial entities in artistic works was described by Herbart in great detail. The eye first sees an aggregate or mass of relations, then isolates and unifies analogous features. Forms are perceived as enclosed; colors stand out against a background; the eye is active within the contours of forms in apprehending secondary relations; the whole is even perceived as moving, for in our formal and spatial analysis we also detach the form from its background."[40]

The relations suggested by Herbert have been affective in formation of modern space conception's oscillating relations between foreground and background for they activate imagination of the viewer and involve eye actions. On the other hand, with his treatise regarding the relations of form, Herbert's interest in psychology more than "content" paves the way to scientific basis as well.

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[37] In Schopenhauer's opinion, the reason why architecture is a "lower" art is that "Platonic Ideals" cannot be assimilated and more readily transparent. Schopenhauer rejects all architectural solutions where the conflict between gravity and rigidity is visibly left out.

[38] Mallgrave and Ikonomou, *ibid*, p. 10.

[39] Mallgrave and Ikonomou, *ibid*, p. 12.

[40] Mallgrave and Ikonomou, *ibid,* pp. 12-13.

Shifting from his physiological background to construct modern psychology as a new scientific domain, Wilhelm Wundt's terminological distinction among concepts of sensation (*Empfindung*), feeling (*Gefühl*), and emotion (*Gemüthsbewegung*) apart from the working human body and mind like muscular sensations and reflexes, neural activity of the eye in perceiving color and binocular vision, determines the conceptual framework to be much discussed in years to follow.[41] As for Robert Zimmermann, whose book consists of two parts, with the first part titled as *Aesthetik* has been published in 1858 and the second part as *Allgemeine Aesthetik als Formwissenschaft* (General aesthetics as a science of form) in 1865, he defines his interest area, the morphology of form as "science of form" in line with Herbert's efforts to establish a scientific basis.

In 1860s, such approaches that advocate aesthetics of "content" as opposing to Herbert and Zimmermann's aesthetics of "form" seem to continue. Mallgrave and Ikonomou define Symbolization and Empathy (*Einfühlung*) as "twin poles of this new direction" by regarding these approaches as "[they were] defining the role that subjective feelings lays in conditioning the perception of form."[42]

Under effect of his father Theodor Vischer's formal symbolism,[43] Robert Vischer has been the first to introduce the idea of Empathy via his dissertation *Über das optische Formgefühl* (On the Optical Sense of Form) written in 1873 on the problem of emotional projection. Robert Vischer points to an important distinction between his thesis of Empathy (*Einfühlung*) and sensation and feeling:

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[41] Mallgrave and Ikonomou, *ibid,* p. 14. With his assimilation theory, Wundt has at the same time been influential in formation of Gestalt Psychology. See Ash, *ibid,* p. 85.

Giedion mentions Wundt's name in his book written in 1948 under the title *Mechanization Takes Command*. "In this period scientists such as Wundt and Helmholtz were eager to devise apparatus to gauge motion in muscles and nerves." Giedion, *M.T.C.*, p. 18.

[42] Mallgrave and Ikonomou, *ibid,* p. 17.

[43] In the mid-19th century, the poet, novelist, political activist, theorist of aesthetics Friedrich Theordor Vischer (1807-1887) in Germany, neglects thinking on the phenomenon of space just like Viollet-le-Duc in France and Ruskin in England, and directs his interest to exterior surface. For his major interest has been on the notion of symbol and emotional transference, symbolism, in his opinion, is "necessary or intrinsic to human aesthetic behaviour in what we define our relation to the world, at least in part, through the symbolic interjection of the emotions into objective forms." Mallgrave and Ikonomou, *ibid,* pp. 19-20. Thus, according to Theodor Vischer "Architecture becomes an art representing *Lebensgefühl*." Cornelis Johannes Maria Van de Ven, *Concerning The Idea of Space: The Rise of A New Fundamental in German Architectural Theory and in the Modern Movements Until 1930*, (Ph.D. Diss., Uni. of Pennsylvania, 1974), p. 92.

> "The former [sensation] is simply the body's physical response to outside stimuli; the latter [feeling] presumes mental or emotional activity. Sensation can also be divided (like feeling) into 'immediate sensation' (*Zuempfindung*) and 'responsive sensation' (*Nachempfindung*). The former is the direct sensory response to external stimuli, while responsive sensation involves the activity of nerves and muscles."[44]

Vischer adapts this distinction to the act of seeing and divides it into two types of seeing: simple seeing and scanning.[45] In Vischer's categorization by importance and priority, scanning as 'higher' level of seeing, not only unifies the representational or imaginative activity of the mind, but also affects the formulation of the idea of space in the 20th century with the emphasis Vischer has put on "mentally constructed image."

According to Robert Vischer, leaving aside the act of seeing, the tactile senses are essential to experience "depth."[46]

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[44] Mallgrave and Ikonomou, *ibid,* p. 22.

[45] "There is **a way of seeing (*Sehen*)** without any special effort, a way of mere looking that relies on physical activity only insofar as certain groups of nerves are tensed. I do not mean here that focused concentration of vision, ignoring everything around it, whereby we fix on just one part of the whole like a marksman. (...) Upon closer inspection, however, we find that a concentrated vision is also working here as we, without being aware of it, focus on a center inseparable from its surroundings, which **is conditioned on the one hand by our standpoint (position of the head, direction of the eyes, visual angle) and on the other hand by the salient feature of the object itself (light).**

This **simple seeing is always a relatively unconscious process**, for the impression received is still undifferentiated. It is nothing more than a dreamlike appearance of an ensemble, but **it is vital to any concrete understanding of space**. (...) **Our body thus all at once receives an aggregate of nerve vibrations; our mind thus has the first prescient flash of an inner conception. We might point out here that this is also the first fateful step to all artistic intuition: an artist must have an 'eye.'**

(...) We achieve this by **muscular activity, by moving the eye while looking at the object: that is, by scanning (*Schauen*). Scanning is a much more active process than seeing, because it does not simply rely on the natural impulse to seek a relative whole; instead, our eye wanders up and down, left and right, making contact with the individual dimensions**. (...)

Scanning is more conscious than mere seeing, for it sets out to analyze the forms dialectically (by separating and reconnecting the elements) and to bring them into a mechanical relationship. (...)

And now, once I have accomplished the process of scanning, **the impression of seeing is repeated on a higher level. What I have seemingly separated I have reassembled into an ordered and restful unity. Again I have an enclosed, complete image, but one developed and filled with emotion**. To chaotic 'Being' I called 'Become!'—and my Summons brought Light and behold, it was Good." Robert Vischer, *Über das Optische Formgefühl: Ein Beitrag zur Aesthetik* (Leipzig: Hermann Credner, 1873), translated as "On the Optical Sense of Form: A Contribution to Aesthetics" in *Empathy, Form, and Space: Problems in German Aesthetics, 1873-1893*, Harry Francis Mallgrave and Eleftherios Ikonomou, eds., (Santa Monica: The Getty Center for the History of Art and the Humanities, 1994), pp. 93-94. Italics are original. Emphases are added.

[46] "(…) we must say a word about **the indispensable *associé* and corrector of the eye—the sensitive and mobile hand**. I have already found myself unable to refrain from referring to touch in a symbolic sense. In truth, however, there is **a very real and intimate connection between the two organs**. Their functions are of a kindred nature: touching is a 'cruder scanning at close range'; seeing is a

In order to construct his theory of Empathy, Vischer refers to Karl Albert Scherner, who has analyzed the symbolism of dreams in his work *Das Leben des Traums* (The Life of the Dream) dated to 1861, where he considers dreams as imaginations translated in mind as visual impressions or symbols:

> "Particularly valuable in an aesthetic sense is the section on 'Die symbolische Grundformation für die Leibreize' (Symbolic basic formation for bodily stimuli). Here it was shown how the body, in responding to certain stimuli in dreams, objectifies itself in spatial forms. Thus it unconsciously projects its own **bodily form—and with this also the soul—into the form of the object. From this I derived the notion that I call 'empathy' (*Einfühlung*)**."[47]

Vischer's theory of Empathy also implies that the Soul is no longer innate in the object observed, but a projection from the individual.[48] Turning the direction of the reception process from subject to object with his theory of Empathy, and by such an emphasis he has placed on subjectification of the perception process, Vischer will be leaving a profound impact upon production of modern object's meaning in the 20th century.

With *Das Problem der Form in der Bildenden Kunst*[49] (The Problem of Form in Fine Arts) the sculptor Adolf Hildebrand has written in 1893, a new channel is opened to provide the idea of space with a different direction to pursue along differently from the notion of Empathy in nineteenth century Germany thought. The fact that the notion of Empathy as envisaging all creative activities to be gathered in the observer has resulted in search for another channel. In formation of this new channel, Hildebrand is not alone as his close relationship and exchange of ideas with his friends theorist Conrad Fiedler

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'more subtle touching at a distance.' (...) Touch is especially important in **learning to 'grasp' distant objects**, which in visual terms are foreshortened and distorted. (...) **Stereoscopic vision provides us with only a planar visual field, and we would inevitably believe that all parts of this field were equidistant from us were it not for the experience gained from our tactile sense: we push the planar visual field away from us with our hand, and thus is laid the foundation for the third dimension of space—depth**." Vischer, *ibid,* pp. 94-95.

[47] Vischer, *ibid,* p. 92. Emphases are added.

[48] Van de Ven, *ibid,* p.101.

[49] Adolf Hildebrand, *Das Problem der Form in der Bildenden Kunst*, (Strasbourg: Heitz & Mündel, 1893), translated as "The Problem of Form in the Fine Arts" in *Empathy, Form, and Space: Problems in German Aesthetics, 1873-1893*, Harry Francis Mallgrave and Eleftherios Ikonomou, eds., (Santa Monica: The Getty Center for the History of Art and the Humanities, 1994).

and painter Hans von Marées have aided him such that his *Das Problem der Form in der Bildenden Kunst* has been shaped in line with ideas and criticisms of Fiedler. Giving hints of this new channel before Hildebrand does, Fiedler reveals his aesthetic theory that were grounded on the notion of visibility in *Über die Beurteilung von Werken der bildenden Kunst* (On judging works of visual art) he has written in 1876 as follows: "...first, to remove the investigation of art from the realm of idealist aesthetics, and, second, to show its specific cognitive formation."[50] Due to his Kantian viewpoint Fiedler suggests two modes of experience as perceptual and conceptual cognition: "Whereas the former [perceptual] is based on mainly on visual experience, the latter [conceptual] is arrived at through a process of abstraction, the conceptual ordering of perceptual data. Both are autonomous but at the same time equal processes."[51] Having seen art never as an imitation of nature, Fiedler regards conceptual or abstract cognition as prior to perception. In Fiedler's theory where he matches conceptual or abstract cognition with imagination, art is a creative act: "Art has nothing to do with forms that existed before and apart from its activity; the beginning and end of its activity lies in the creation of forms that only come into being with it. Art creates no second world alongside another independent world; rather, it creates a world made by and for artistic consciousness."[52] Influenced by Gottfried Semper's theories in considering material as important, Fiedler thinks that as a result of the intellectual process, material attains form and existence as a purer creation of the mind.[53]

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[50] Mallgrave and Ikonomou, *ibid,* p. 30.

[51] Mallgrave and Ikonomou, *ibid,* p. 30.

[52] Conrad Fielder, *Über die Beurtheilung von Werken der bildenden Kunst* (1876), in *Konrad Fiedler: Schriften zur Kunst*, Gottfried Boehm, 2 vols. (Munich: Wilhelm Fink, 1991), vol. 1, p. 32. Quoted by Mallgrave and Ikonomou, *ibid,* p. 31 and fn. 97.

[53] "Architectural thinking is not merely invention and combination; nor is it a forming and designing in accordance with prescribed laws; rather, it is a process that is **a law unto itself**. If this process is to be termed thinking at all, it must consist of an effort to fashion **the given raw material into an ever purer creation of the mind**. Architectural consciousness in the artistic sense exists only where an intellectual process of evolution is visible in the forms and where an active striving for an ever purer intellectual expression appears in the development of those forms. (...) **Form has no existence except in material, and the material, to the mind, is not only the means by which form expresses itself but the medium in which form achieves existence**.

The architect has not been granted any special, inherent, intellectual power, by virtue of which he produces his works; his work manifests **the universal nature of the human intellect through a specific medium and in a specific form.** (...) Its highest goal will always be **to find the form that as a pure expression of its own identity can be the truest product of the mind**." Conrad Fielder,

In *Das Problem der Form in der Bildenden Kunst* of 1893, expanding the channel opened by Fiedler's cognitive formation owing to his notion of visibility and letting it become more well-known, Adolf Hildebrand deals with the object as an artistic experience and spatial relationship of the observer. Despite the fact that he is interested more in sculptural form rather than architectural space, sculptor Hildebrand has profoundly affected the 20th century theories of art and architecture with his approach to subject-object relationship as a perception process of visual experience.[54]

Hildebrand begins his essay with a duality: "the relation of form to appearance [*Erscheinung*] and its applications for artistic representation [*Darstellung*]."[55] Considering, just like Fiedler, cognitive formation as important, Hildebrand claims that, on basis of the different appearances in the external world and our relations with the external world, lie our cognitive formation regarding the idea of space and form.[56] He proposes scientific and artistic ways of seeing, which correspond to his idea of form where space is unlimited and his idea of space where space is an essential reality, as divided into two kinds of image formation: Vision-in-motion or Kinesthetic vision [*Bewegungsvorstellung*] and Visual vision [*Gesichtsvorstellungen*][57] (Figure 2.1).

"Bemerkung über Wesen und Geschichte der Baukunst," *Deutsche Rundschau* 15 (1878), pp. 361-383, translated as "Observations on the Nature and History of Architecture" in *Empathy, Form, and Space: Problems in German Aesthetics, 1873-1893*, Harry Francis Mallgrave and Eleftherios Ikonomou, eds., (Santa Monica: The Getty Center for the History of Art and the Humanities, 1994), pp. 130-131. Emphases are added.

[54] "Many ideas that were discussed in cubist magazines originated in German romanticism and were transformed in the psychological theories of perception. Gustav Theodor Fechner's 'Aesthetik von unten' (based on the pleasure of perception) and Konrad Fiedler's recognition of the 'erkennende Durchdringung' (recognizing penetration) as an aspect of creation were the most important ideas.* They called attention to the problem of representing volume, space, and time." Moravanszky, *Competing Visions*, (Cambridge, Mass.: The M.I.T. Press, 1998), p. 344. For the impact of Hildebrand and others upon particularly the Czech Cubist movement, see chapter 8 "Folded Facades: Cubism and Empathy," pp. 333-363. *Gustav Theodor Fechner, *Zur Experimentalen Ästhetik* (1871) and *Vorschule der Ästhetik* (1876), reprinted in 2 vols. (Hildesheim: Olms, 1978); *Konrad Fiedler, Schriften zur Kunst* (1913-1914; reprint, Munich: Fink, 1971).

[55] Hildebrand, *ibid,* p. 227.

[56] Hildebrand, *ibid,* p. 227.

[57] "In order to understand the relation between form and appearance, we must first of all get a clear understanding of a distinction in the mode of perception. (...) Let us further assume that the observer can move but only toward or away from the object. If his vantage point is distant, the eyes no longer converge at an angle but view the object in parallel lines. Then the overall image is two-dimensional, for the third dimension (all closer and more distant parts within the object's appearance) or the modeled object can be perceived only by surface contrasts: that is, as surface features indicating **distance or nearness**. If the observer steps closer to the object, he will need a different visual

> "First and foremost is his distinction between visual and kinesthetic perception, from which also arises the distinction between visual and kinesthetic notions. The term *kinesthetic* refers exclusively to eye movement. Visual perception thus occurs when the eye at rest takes in a 'distant view'; kinesthetic perception relates to the 'near view,' when the eye is required to undergo a series of movements in order to grasp the whole object. Since the distant image on the retina is always two-dimensional, our experience with the third dimension, or the object's plasticity, is something gradually acquired with age, either from actual physical movements or from kinesthetic ideas."[58]

Depending on the observer's capacity to perceive space, Hildebrand suggests two kinds of movements: the first one is the change of observer's position and the second is the adjustment of the eyes in relation to how distant or near the object is. In visual perception, both the eye and the body are in rest. The image obtained by one distant point parallel to the observer's eyes is "the distant image" (*Fernbild*). Besides offering a single unified two-dimensional planar image, the distant image shows all points of the object in equal sharpness. On the other hand, in *Kinesthetic vision*, the observer's body is in movement and the eyes continuously converge at one point, but focusing on different points of the object in changing nearness. From then on, it is possible to perceive neither a totally sharp image, nor the whole. As denoted by architectural

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accommodation to see the given object; he will cease taking in the overall appearance at *one* glance and **can compose the image only by moving the eyes back and forth and making various accommodations**. He will therefore divide the overall appearance into **several visual impressions that are connected by the movements of his eyes**. The closer the observer comes to the object, the more eye movements he will need, and the less coherent will be the visual impression. Finally the field of vision becomes so confined that he will be able to focus only on one point at a time, and he will experience **the spatial relationships between different points by moving his eyes**. Now seeing becomes **scanning**, and the resulting ideas are not visual [*Gesichtsvorstellungen*] but **kinesthetic** [*Bewegungsvorstellungen*]; they supply the material for an abstract vision and idea of form.

These two extremes of visual activity are actually two different modes of seeing. The image received by the viewing eye at rest expresses three-dimensionality only by surface signs, through which coexisting elements are simultaneously apprehended. At the other extreme, **the eye's mobility enables it to scan a three-dimensional object directly from a close vantage point and to transform the perception into a temporal sequence of images**.

All modes of perception between these extremes combine visual impressions and kinesthetic activity; they are impure with regard to their experiential components. Foremost is **stereoscopic vision, in which we actually see the object from two vantage points at the same time. The movement from one to the other has been condensed into a single moment, for the difference in vantage points coincides with the distance between the simultaneously viewing eyes**. This is basically a combination of a visual impression and a kinesthetic process; we can separate the two by closing one eye at a time to resolve the common image back into two separate images. In doing so, we push the object away from us, as it were, and receive a completely coherent surface image [*Flächenbild*].

For the sake of simplicity let us call this pure surface image the distant image [*Fernbild*]." Hildebrand, *ibid,* pp. 229-230. Italic is original. Emphases are added.

[58] Mallgrave and Ikonomou, *ibid,* pp. 36-37.

historian Sokratis Georgiadis, the movement of Hildebrand's *Kinesthetic vision* is linear and uninterrupted: "…the observer moves along a straight line, the line connecting the observer with the object. …The position of the observer can be anywhere along this connecting line (or 'line of direction'). All movement is linear and uninterrupted."[59]

Apart from perception Hildebrand also separates the reality of form as a duality: Inherent Form (*Daseinsform*) and Effective Form (*Wirkungsform*):

> "By developing kinesthetic ideas and the outlines of objects associated with them, we are able to attribute to objects a form that is independent of changing appearance. We recognize this form as that factor of the appearance that depends solely on the object. We call this form, which is partly gained through movement directly and partly abstracted from the appearance, the *inherent form* [*Daseinsform*] of the object.
>
> Yet the impression of form that we acquire from the appearance and that is contained in it as an expression of the inherent form is always a joint product of the object, on the one hand, and of its lighting, surroundings, and our changing vantage point, on the other. In contrast to the abstracted, unchanging inherent form, this may therefore be termed the *effective form* [*Wirkungsform*].
>
> It is in the nature of effective form that each individual factor of the appearance has meaning only in relation and contrast to another factor and that all distinctions of size, light and shade, color, and so on, can have only a relative value. Everything depends on reciprocity. Everything affects and determines the value of everything else."[60]

According to Mallgrave and Ikonomou, contrast to objective character of "Inherent Form," "Effective form" has relative character:

> "Inherent form is the measurable, mathematically quantifiable form of nature; it is the abstract, unchanging, numerical value that can be assigned to a form, independent of its surroundings. By contrast, the effective form, the form that we perceive within a specific context, is always relative and therefore dependent on ambient light, shadow, color, and other objects. Since each quality affects all others, there must always be a translation of inherent spatial values into effective or relative values that are valid for one particular visual frame."[61]

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[59] Sokratis Georgiadis, *Sigfried Giedion; An Intellectual Biography*, trans. by Colin Hall, (Edinburgh: Edinburgh Uni. Press, 1993), p. 116.

[60] Hildebrand, *ibid,* p. 233. Italics are original.

[61] Mallgrave and Ikonomou, *ibid,* p. 37.

In order to bring together inherent form as an expression of physical reality with effective form consisting of such variable factors as illumination, color, environment, and standpoint of the observer, Hildebrand constructs the concept of spatial values and presents this as the special artistic power and talent:

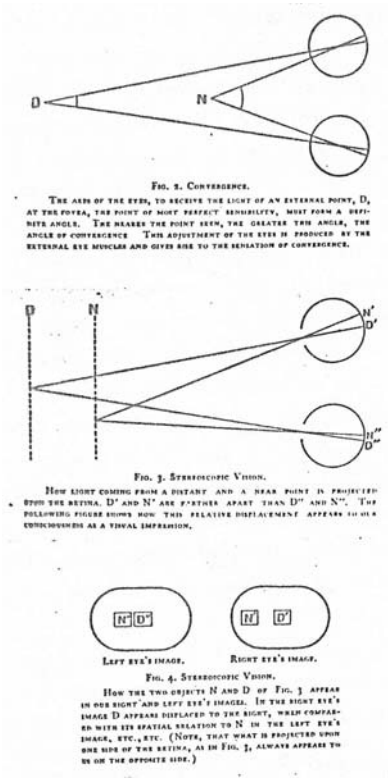

Fig. 2. Convergence.

The axes of the eyes, to receive the light of an external point, D, at the fovea, the point of most perfect sensibility, must form a definite angle. The nearer the point seen, the greater this angle, the angle of convergence. This adjustment of the eyes is produced by the external eye muscles and gives rise to the sensation of convergence.

Fig. 3. Stereoscopic Vision.

How light coming from a distant and a near point is projected upon the retina. D' and N' are further apart than D'' and N''. The following figure shows how this relative displacement appears to our consciousness as a tonal impression.

Fig. 4. Stereoscopic Vision.

How the two objects N and D of Fig. 3 appear in our right and left eye's images. In the right eye's image D appears displaced to the right, when compared with its spatial relation to N in the left eye's image, etc., etc. (Note, that what is projected upon one side of the retina, as in Fig. 3, always appears to us on the opposite side.)

Figure 2.1 Hildebrand's theory of artistic perception, illustrating the principle of vision of motion. From *Concerning The Idea of Space: The Rise of A New Fundamental in German Architectural Theory and in the Modern Movements Until 1930*, Cornelis Johannes Maria Van de Ven, (1974), p. 107.

> "The unity of appearance, which has nothing in common with the organic whole or the unity of an occurrence found in nature, consists of the interaction of contrasting factors and their combined ability to evoke the appearance of a spatial whole.
>
> The specific product of contrasting factors that make up a spatial idea (as distinct from the stimuli that reside in ideas of movement) will be described by the term *apparent spatial values.*
>
> When, for example, a form is visually modeled by light and shade, the apparent means or contrast is one of brightness and darkness. Insofar as the modeled effect of lightness and darkness is achieved in this **specific relationship and position—thus yielding a value for the integrating eye of the mind—it represents an apparent spatial value**.

> Since the spatial appearance is itself a product of different elements working together in nature—such as the object as inherent form; its natural color; the source, quality, and direction of light; and the observer's vantage point—spatial values signify more or less rich intersections or nodal points of these natural effects. They materialize as a conjunction of inherently discrete elements of nature; **a unity that only the visual sense can grasp. This unity presents a number of separate relationships at the same time, which enable the imagination to gain its bearings in space, that is, to grasp the spatial situation. Through spatial values we are able to create a continuous, necessary, and self-conditioning appearance out of objects that in and of themselves stand in no necessary spatial relationship to each other and hold no necessary, relative spatial positions**. It is now easy to see that **the special artistic power and talent** of a painter lie in the discovery of apparent spatial values and that within the image the artist's **formative and integrating skill** manifests itself in spatial values."[62]

In this regard, as an opposition to the notion of Empathy envisaging all creative activities to be collected in the observer, Hildebrand considers that, it is the artist from which the unity of appearance and of functional and spatial values get their values due to the perceptual process.

While remarking that we look at nature as total space, Hildebrand mentions this in connection with Cartesian three-dimensionality on the one hand, and explains this totality via concepts of space continuum and continuity, on the other:

> "**By a spatial continuum we mean space as three-dimensional extension and as a three-dimensional mobility or kin esthetic activity of our imagination**. Its most essential attribute is **continuity**. Let us therefore imagine the spatial continuum as a body of water in which we can submerge containers and thus define individual volumes as specifically formed individual bodies without losing the conception of the whole as one continuous body of water. This spatial continuity of nature will be expressed in the artistic representation if we can only capture the most elementary effect that nature imposes on us. **Since we do not view nature simply as visual beings tied to a single vantage point but, rather, with all our senses at once, in perpetual change and motion**, we live and weave a spatial consciousness into the nature that surrounds us, even where the appearance before us offers scarcely any point of reference for the idea of space. We do not ask how this awareness comes into being or on what impressions and perceptions it is based. Nor do we demand that space

[62] Hildebrand, *ibid,* p. 241. Italics are original. Emphases are added.

constantly be exemplified in the appearances before us: we remain aware of it even when we close our eyes."[63]

As creator of the Space continuum concept, Hildebrand receives this as continuity of the air and void relation between the bodies, which will later be affecting Giedion's modern space conception and begins to emphasize immateriality more than materiality:

> "If we now set for ourselves the task of making visible the appearance of this natural space as a whole, then we first have to imagine **it three-dimensionally as a void filled in part by the individual volumes of objects and in part by the air**. **The void exists** not as something externally limited but rather as something **internally animated**. Just as **the boundary or form of an object indicates its volume**, it is also possible to compose objects in such a way that **they evoke the idea of a volume of air bounded by them. The boundary of an object is, strictly speaking, also the boundary of the body of air surrounding it. The question then becomes one of arranging objects (and with them the kinesthetic idea that they evoke) in such a way that they do not remain fragmented but become continuous; we must connect one object with another in every direction of a general space**, so that we, on the basis of such kinesthetic ideas, experience and understand **space as a total volume or as a general space, a continuous and unbroken whole**. Objects thus have to be used to build up a total space and create what one could call a kinesthetic framework, which — though discontinuous — nevertheless suggests a continuous total volume. In this way **the individual object becomes a structural component; its position within the void is defined by the general spatial development and by its own capacity to evoke and stimulate our idea of space**."[64]

Owing to its movement characteristic, Hildebrand's notion of kinesthetic vision introduces temporality in formation of the perceptional image of total space. Hildebrand's concept of kinesthetic vision foreshadows the later Van Doesburg's principle of *Space-Time*, Moholy-Nagy's principle of *Vision-in-motion*, Le Corbusier's the notion of *Promenade Architecture* and Giedion's modern space conception termed as *Space-time.*

Interested in psychological aesthetics instead of a formalist concern with visibility, Heinrich Wölfflin, whose doctoral dissertation titled *Prolegomena zu einer Psychologie der Architektur* (Prolegomena to a Psychology of Architecture) in 1886 has been a

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[63] Hildebrand, *ibid,* p. 241. Emphases are added.

[64] Hildebrand, *ibid,* p. 239. Emphases are added.

"search for the universal laws governing artistic formation and stylistic evolution, the attempt to establish an expository *Kunstwissenschaft*,"[65] influences the late nineteenth-century German aesthetics and Giedion, whom he will later be the thesis advisor. The four professorial mentors of Wölfflin's thesis, namely as Jacob Burckhardt, Heinrich von Brunn, Johannes Volkelt and Wilhelm Dilthey, have all been influential in formation of Wölfflin's art history conception and in shaping of his later intellectual thought. Wishing to become a cultural historian under effect of Burckhardt's essays, Wölfflin realizes the insufficiency of the methodology required for cultural history to be deemed as a scientific discipline. Owing to Dilthey's lectures at Berlin in 1885, Wölfflin thinks he has found the appropriate methodology: "...foundation for the study of society and history. I must make every effort to master the substance of these ideas."[66] In 1885, Wölfflin decides on his dissertation topic: "Moreover, in the last few weeks I have had many good ideas for my dissertation, which will not be purely philosophical but rather an attempt to treat art history philosophically. I shall pose the question: How can architectural forms express the character of a period? What art historians say about this is idle chatter and philosophers generally lack training in art history."[67] At the beginning of his dissertation, Wölfflin poses the question for which he has been searching: "The observations that follow concern a question that seems to me an altogether remarkable one: How is it possible that architectural forms are able to express an emotion or a mood?"[68] The aim of Wöfflin is to explain architectural forms directly in relation to visible expressions of emotions. With the help of "Psychology of Architecture" he has invented, Wöllflin "had the task to explain the hidden symbolism

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[65] Mallgrave and Ikonomou, *ibid,* p. 40.

[66] John Goldhammer Hart, *Heinrich Wölfflin: An Intellectual Biography*, (Ph.D. Diss., Uni. of California, Berkeley, 1981), p. 74. Quoted by Mallgrave and Ikonomou, *ibid,* p. 41.

[67] Joseph Gartner, ed., *Heinrich Wölfflin, 1864-1945: Autobiographie, Tagebücher und Briefe*, (Basel: Benno Schwabe, 1982), p. 29. Quoted by Mallgrave and Ikonomou, *ibid,* p. 41.

[68] Heinrich Wölfflin, *Prolegomena zu einer Psychologie der Architektur, Inaugural-Dissertation der hohen philosophischen Fakultät der Universität München zur Erlangung der höchsten akademischen Würden* (Munich: Kgl. Hof- & Universitäts-Buchdruckerei, 1886). Translated as *Prolegomena to a Psychology of Architecture*, in *Empathy, Form, and Space: Problems in German Aesthetics, 1873-1893*, Harry Francis Mallgrave and Eleftherios Ikonomou, eds., (Santa Monica: The Getty Center for the History of Art and the Humanities, 1994), p. 149.

in architectural masses, infused into them by latent forces of the human soul."[69] He refutes previous experimental efforts and perception of the form by regarding them merely as physical judgements in making aesthetic judgements:

> "Reasonable enough when put this way, but the theory lacks the one essential requirement—confirmation by experience. We have only to ask ourselves: How much of the form's actual impression can be explained by the kinesthetic response? Is the greater or lesser ease with which the eye performs its movement to be regarded as the crucial factor in a multitude of effects? The most superficial psychological analysis will show how little such theory squares with reality."[70]

As Dilthey, who has been interested in matter and form, regards psychology that deals with "inner experience" instead of "outer experience" of natural sciences, as the essential science,[71] in Wölfflin's opinion who has found the methodology he has been searching for, "the anthropomorphic physiognomy embodied in corporeal mass was the essence of architecture."[72] In line with the anthropomorphic reading of architectural form that continues since the Classical Vitruvian tradition, Wölfflin's anthropomorphic model has suggested that the human body defines the aesthetic norm which is based on our perceptual experience.[73] Wölfflin explains the principles of his anthropopathic

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[69] Van de Ven, *ibid,* p. 117.

[70] Wölfflin, *ibid,* pp. 150-151.

[71] Wilhelm Dilthey, *Selected Works: Introduction to the Human Sciences*, Rudolf A. Makkreel and Frithjof Rodi, eds., trans. Michael Neville (Princeton: Princeton Uni. Press, 1989), vol. 1 pp. 48-50. Cited from Mallgrave and Ikonomou, *ibid,* p. 48.

[72] Van de Ven, *ibid,* p. 117.

[73] "So here, too, we must say: ***Physical forms possess a character only because we ourselves possess a body***. If we were purely visual beings, we would always be denied an aesthetic judgement of the physical world. **But as human beings with a body that teaches us the nature of gravity, contraction, strength, and so on, we gather the experience that enables us to identify with the conditions of other forms**. (...)

(…) **Forms become meaningful to us only because we recognize in them the expression of a sentient soul. Instinctively we animate each object**. This is a primeval instinct of man.

(...) At this point, some might become dubious and question **what similarities or expressive feelings** we could possibly share with an inanimate stone. Briefly, there are degrees of heaviness, balance, hardness, etc., all of which have expressive value for us. **Since only the human form, of course, can express all that lies in humanity, architecture will be unable to express particular emotions that are manifested through specific faculties.** Nor should it try to do so. Its subject remains *the great vital feelings,* the moods that presuppose a constant and stable body condition.

(...) ...that language also provides a wealth of examples of **how we habitually apprehend everything in the physical world in the form of animate beings**. We need only recall architectural

theory as in the following: First, every mood has an expression, which is the physical manifestation of mental process. Second, when we imitate the expression of an emotion, we will experience this emotion. Third, we unconsciously transfer the emotions.[74]

Wölfflin transforms his anthropomorphic explanation into a model and then begins to generalize: "Wölfflin's interest in a personal psychology of form itself evolved in the final section of the *Prolegomena,* 'Principles of Historical Judgement.' The dominant theme here, forecasting his later art-historical interests, is the all-important historiographic leap that he ventures — from the anthropomorphic expression of individual form to the collective expression, the 'prevailing attitude and movement,' of a people or a nation."[75] At the end of his dissertation, Wöllflin alleges that, by a similar generalization, psychology can provide for the "exact basis" that was searched for art history:

> "The ideal of 'working exactly' is also present in the historical disciplines. Art history adopts such an ideal above all to avoid any corrupting contact with aesthetics; and often the historian simply strives to describe what happened and when, without comment. (…) A history that seeks only to ascertain the chronology of what has taken place cannot be sustained; it would be particularly mistaken if it supposed itself thereby to have become 'exact.' One can work exactly only when it is possible to capture the stream of phenomena in fixed forms. Mechanics, for instance, supplies physics with such fixed forms. **The humanities still lack any such foundation; it is only in psychology that it can even be sought. Psychology would also enable art history to trace individual events to general principles or laws**. Psychology is certainly far from a state of perfection in which it could present itself as an organon for historical characteristics, but I do not believe this goal is unattainable."[76]

In 1888, Wölfflin publishes his second book *Renaissance und Barock* (Renaissance and Baroque)[77] that he has dedicated to Heinrich von Brunn, lecturer on classical archeology and on the painter Raphael which are also participated by Wölfflin in 1883

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terminology. Wherever a finite entity presents itself, **we give it a head and foot**, look for a front and back, and so on." Wölfflin, *ibid,* pp. 151-152. Italics are original. Emphases are added.

[74] Wölfflin, *ibid,* pp. 155-156. Italic is original. Emphases are added.

[75] Mallgrave and Ikonomou, *ibid,* p. 46.

[76] Wölfflin, *ibid,* p. 184. Emphases are added.

during his education at Munich. Under influence of Heinrich von Brunn, taking Robert Vischer's theory of "Lebensgefühl" of the epoch into consideration as concerned with the Hegelian approach, Wölfflin makes stylistic and historical classifications, and at the beginning part of his dissertation written in 1886, he defines these as "characterization":

> "The fact is indisputable. Not only does the judgement of the layman most decidedly confirm that every building produces a specific impression within a whole range of moods, from the serious and the somber to the cheerful and the friendly, but even **the art historian does not hesitate to characterize periods and nations by their architecture**. The capacity for expression is thus conceded. But how? On what principles does the historian make judgements?"[78]

When explicating the causes of style change in his book *Renaissance und Barock*, Wölfflin benefits from Adolf Göllner's theory on psychological investigation of architectural form within the question of style he has written in 1887.[79] In the 1890s under the influence of his friends Fiedler and also his idol Hildebrand, Wölfflin gradually converts his psychological explanations to a more formal-visual interpretation. In 1915, he publishes *Kunstgeschichtliche Grundbegriffe* (Principles of Art History) where he has developed a model for style change based on dual notions and oppositions to explain all visual experiences. The emphasis he has put on the notion of Empathy has faded away entirely; "Art history became the science that methodically analyzed the formal aspects of style."[80]

Affected by Jacob Burckhardt's notion of cultural history resembling Heinrich Wölfflin, August Schmarsow has wished to attribute to his genetic approach[81] of history a scientific footing grounded on *Kunstwissenschaft* that was widespread during the 19th

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[77] Heinrich Wölfflin, *Renaissance und Barock: Eine Untersuchung über Wesen und Entstehung des Barockstils in Italien*. (Munich: Theodor Ackermann, 1888).

[78] Wölfflin, "Prolegomena to Psychology of Architecture," p. 149. Emphases are added.

[79] Alfred Göllner, "Was ist die Ursache der immerwährenden Stilveränderung in der Architektur?" in *Zur Aesthetik der Architektur*, (Stuttgart: Konrad Wittwer, 1887), pp. 1-48. Translated as *What is the Cause of Perpetual Style Change in Architecture?*, in *Empathy, Form, and Space: Problems in German Aesthetics, 1873-1893*, Harry Francis Mallgrave and Eleftherios Ikonomou, eds., (Santa Monica: The Getty Center for the History of Art and the Humanities, 1994), pp. 193-225.

[80] Van de Ven, *ibid,* p. 120.

[81] Schmarsow, *ibid*, pp. 282-283.

century. When Hildebrand published his essay in 1893, Schmarsow has held an inaugural speech in Leipzig titled as "Das Wesen der Architektonischen Schöpfung"[82] (The Essence of Architectural Creation). He begins with criticizing Semper's idea of architecture as the "art of dressing" (*Bekleidungskunst*). In his opinion, the principle of dressing "view their activity as little more than superficial composition of purely technical and decorative kind, the pasting up of inherited styles on the framework of a functional construction, during which process even the best of them is at a loss to summon up any creative enthusiasm."[83] In order to overcome this state of "aesthetics from without" creating a "feeling of alienation," Schmarsow proposes "aesthetics from within" in line with the aesthetics theorist Gustav Fechler's dualist theory:[84]

> "Is it not time to inquire into the origin and innermost essence of architecture? The genetic approach, long accepted in the historical disciplines and now increasingly being used in the natural sciences, would be no less fruitful in the science of art, which lies between the two. This would simply mean replacing aesthetic 'from above' and 'from below,' which since [Gustav] Fechner have been opposed to one another, with aesthetic 'from within'; and we might begin this process of moving 'from within' with architecture, which for so long has been externalized by an aesthetic imposed 'from without.' The aesthetic contemplation of our simplest forms—the psychological explanation of their immediate impression or play of associative factors—already takes as its starting point the creative and appreciative subject. To complement this analysis of the individual details or parts, which so easily loses sight of the steady connection with the whole, we approach the problem from the opposite angle—namely, by seeking out the kernel of the organism that justifies all the individual details and parts. It is important in a basic study to give due weight to the psychological origin of the creative act and to test the belief

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[82] Inaugural lecture given at the University of Leipzig on 8 November 1893. August Schmarsow, *Das Wesen der Architektonischen Schöpfung* (Leipzig: Karl W. Hiersemann, 1894). Translated as *The Essence of Architectural Creation*, in *Empathy, Form, and Space: Problems in German Aesthetics, 1873-1893*, Harry Francis Mallgrave and Eleftherios Ikonomou, eds., (Santa Monica: The Getty Center for the History of Art and the Humanities, 1994), pp. 281-297.

[83] Schmarsow, *ibid*, p. 282. Schmarsow refers the book of Hans Schliepmann titled as *Betrachtungen über Baukunst* supporting his claim: "(...) Instead of giving an appropriate form to an idea, we have forced the idea into the the fixed form. Like a fashionable tailor, the architect has used every kind of cloth for every kind of body." Hans Schliepmann, *Betrachtungen über Baukunst*, (Berlin: Seydel, 1891) p. 22. Quoted by Schmarsow, *ibid,* p. 282. Unnumbered footnote.

[84] Although he has been trained as a physician and physicist, in *Vorschule der Aesthetik* (Introduction to Aesthetics) he has written in 1876, Gustav Fechler (1801-1887) accuses all previous aesthetics theories of being *von Oben* (from above, from universals to particulars) and alleges that the new aesthetics theory he has offered as based on empirical evidence is *von Unten* (from below). Cited from Mallgrave and Ikonomou, *ibid,* p. 14.

that in this art, as in all others, what is truly essential can only start in the mind of the artist and end in the mind of the observer."[85]

Unlike Wölfflin's psychology of form, the major interest of Schmarsow is "from within", i.e., interior space. According to Schmarsow, artistic creation comes prior to the mental eye[86] and the common denominator in the creative process is the "spatial constructs" (*Raumgebilde*).[87] Schmarsow considers intuited form as "the nucleus of every spatial idea" constituting these spatial products and claims that this intuited form of space can only be created with sensory experience of body:

> "Psychologically, the intuited form of three-dimensional space arises through the experiences of our sense of sight, whether or not assisted by other physiological factors. All our visual perceptions and ideas are arranged, are ordered, and unfold in accordance with this intuited form; and this fact is the mother lode of the art whose origin and essence we seek.
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> The intuited form of space, which surrounds us wherever we may be and which we then always erect around ourselves and consider more necessary than the form of our own body, consists of the residues of sensory experience to which the muscular sensations of our body, the sensitivity of our skin, and the structure of our body all contribute. As soon as we have learned to experience ourselves and ourselves alone as the center of this space, whose coordinates intersect in us, we have found the precious kernel, the initial capital investment so to speak, on which architectural creation is based—even if for the moment it seems no more impressive than a lucky penny. Once the ever-active imagination takes hold of this germ and develops it according to the laws of the directional axes inherent in even the smallest nucleus of every spatial idea, the grain of mustard seed grows into a tree and an entire world surrounds us. Our sense of space [*Raumgefühl*] and spatial imagination [*Raumphantasie*] press toward spatial creation

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[85] Schmarsow, *ibid,* p. 282.

[86] "The architectural creation would stand before the mental eye, still with its varied forms intact, yet pure and accessible to the question that we pose." Schmarsow, *ibid,* pp. 285-286.

[87] "From the troglodyte's cave to the Arab's tent; from the long processional avenue of the Egyptian pilgrimage temple to the Greek god's glorious column-borne roof; from the Caribbean hut to the German Reichstag building—**we can say in the most general terms that they are all without exception *spatial constructs* [*Raumgebilde*], whatever their material, duration, and construction, and whatever the configuration of their supporting and supported parts**. (...) The reference to the human need for protection against the hardships of the external world, or indeed any other reference to a specific purpose, is premature as long as we are pursuing an **aesthetic investigation. External stimuli provide only the contingent cause, the occasion for the exercise of human skill. Yet even the smallest human attempt to make a spatial enclosure presupposes that the person has some notion of the intended spatial construct**. Thus we come to the final precondition: **the predisposition to the intuited form [*Anschauungsform*] that we call space**." Schmarsow, *ibid,* p. 286. Italics are original. Emphases are added.

[*Raumgestaltung*]; they seek their satisfaction in art. We call this art architecture; in plain words, it is the *creatress of space* [*Raumgestalterin*]."[88]

"(…) Architecture, therefore, is the creatress of space, in accordance with the ideal forms of the human intuition of space"[89]

After exemplifying tangibility, which was required for formation of our intuition of space, with primary sensory experience, Schmarsow alleges that the relationship between spatial creation and the subject is established with the help of axial systems of coordinates.[90] Parallel to his words as "enclosing the subject," Schmarsow fosters a "sense of space" that emanates from human body and its extensions in all six directions.[91] Under effect of Carl Stumpf's work published in 1873 as *Über den*

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[88] Schmarsow, *ibid,* pp. 286-287. Italics are original.

[89] Schmarsow, *ibid,* p. 288.

[90] "Architectural creation begins with the tangible setting up—if I may call it so—of the backbone of our intuition of space. **The axial system of coordinates compellingly predefines the natural law that regulates creation**. The law necessarily and immediately manifest itself in the important fact that spatial creation never detaches itself from the subject but always implies a relationship with the observer and creator. **Every spatial creation is first and foremost the enclosing of a subject**; and thus architecture as a human art differs fundamentally from all endeavors in the applied arts." Schmarsow, *ibid,* p. 288. Emphases are added.

[91] "We all carry **the dominant coordinate of the axial system within ourselves in the vertical line** that runs from head to toe. This means that as long as **we desire an enclosure for ourselves, the meridian of our body need not be visibly defined; we ourselves, in person, are its visual manifestation. As the creatress of space, architecture creates**, in a way no other art can, **enclosures for us in which the vertical middle axis is not physically present but remains empty**. It operates only ideally and is defined as the place of the subject. For this reason, such interior spaces remain the principal element far into the evolution of architecture as an art. **The spatial construct is, so to speak, an emanation of the human being present, a projection from within the subject, irrespective of whether we physically place ourselves inside the space or mentally project ourselves into it**, and also irrespective of whether a human likeness such as a statue is substituted for that individual, or whether the shade of some departed person is imagined to be present. (…)

Next to the vertical line, whose living bearers resolve space by our bodily orientation into above and below, front and back, left and right, the most important direction for the actual spatial construct is the direction of free movement— that is, forward—and that of our vision, which, with the placement and positioning of the eyes, defines the dimension of depth. (…) A tent erected solely for the protection of the sleeper can be lower, for **the axis of depth, now defined by the length, of the body, emerges as the dominant axis of the spatial form**. (...)

For the dimension of width, the span of our arms from left to right provides a minimal standard so long as the width of the viewing angle and the changing direction of our gaze do not also demand a greater distance from wall to wall in this axis. (…)

This relationship, however, immediately reverses itself when we step outside the interior space and view the exterior of the spatial construct. With our meridian operating as a middle axis of extension looking both left and right, we now demand the satisfaction of the law of symmetry, and we see ourselves facing the vertical axis of the spatial construct with our demand that all relationships be in

Psychologischen Ursprung der Raumvorstellung[92] (On the Psychological Origin of Spatial Imagination), Schmarsow utilizes the Cartesian axial system and its body as the natural spatial center within such a content that resembles that of Stumpf's work.[93]

From then on, different from the imitations of the human body ever-existing since Vitruvius, architecture and space in Schmarsow's opinion were to generate non-anthropomorphically from the human body[94] (Figure 2.2).

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proportion. **The entire spatial construct now appears to us as a body outside of ourselves in a general space; thus all principles in relation to the building's exterior shift in relation to those of the interior space, that is, to the enclosure of the subject, with which we started.**" Schmarsow, *ibid,* pp. 288-291. Emphases are added.

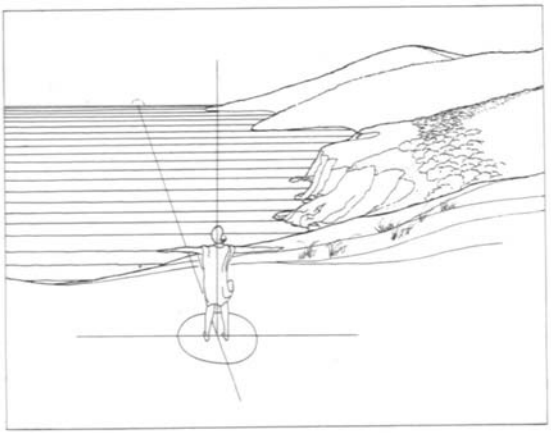
[92] Carl Stumpf, *Über den Psychologischen Ursprung der Raumvorstellung* (Leipzig: S. Hirzel, 1873)

[93] "'What we perceive originally and directly is the visual field, the whole visual field.... If this continually changes through movement, we retain the disappearing parts in our minds and unite them with the newly perceived spaces into a whole. Thus out of many spaces arises one space; this is explained by the continuity of space.'* This emphasis on the whole physis of the perceiver —the awareness of our own body rather than emphasis just on the visual perception itself—was quite new in its approach. (…) With our body as 'the natural spatial center,' our sense or feeling of space is determined by such notional controls as right and left, front and rear, above and below. Through this system of natural coordinates, we determine the position of each external object." Mallgrave and Ikonomou, *ibid,* p. 60. * Stumpf, *ibid,* pp. 275-276, 278, 307.

[94] The impacts of Schmarsow and Hildebrand's space conceptions are still in question in our time:

"(…) The psychological effect of this horizontality over such a broad extent is calming. Our understanding of it comes from an awareness of our own bodies. **In gazing at the horizon, we intuitively feel its horizontality because our bodies are at right angles with it**. (…) We are intuitively aware of gravity because we walk upright and must maintain our balance while in this rather unstable position, unstable at least as compared with those creatures whose bodies are parallel to the ground because they stand on four legs rather than two. In our perception of things, 'upright' is perfectly perpendicular to the horizon. (…) **We judge things outside ourselves from a body-related understanding *first,* and an intellectual understanding *second,*** not the other way around. (...)

To expand on the situation of gazing at the horizon while standing, our orientation is further keyed into our bodies through an awareness of a horizontal, or 'plane-oriented' relationship with the scene before us, as well as with the vertical or perpendicular relationship to it described above. **When we stand, we are intuitively aware that our primary orientation to the world is in relation to both our body's symmetry and its frontality In other words, we are first of all aware of the direction we are facing; and the secondary characteristics of our frontality follow suit. That is, we are secondarily aware of the existence of left, right, and rear with respect to our frontality**. Thus our awareness of our bodies in space involves a Cartesian, or foursquare, relationship of ourselves to the world around us from the spot where we stand. Although all this may sound basic and obvious, it is very important in understanding how we intuitively structure our three-dimensional physical world of space. **We perceive the world from a referential structure of right angle relationships in both the horizontal and vertical planes, *and it is from this natural characteristic of our perception of the world that geometry is born.***" Norman Crowe, *Nature and the Idea of a Man-Made World; An Investigation into the Evolutionary Roots of Form and Order in the Built Environment*, (Cambridge, Mass.: The M.I.T. Press, 1997), pp. 49-51. Italics are original. Emphases are added.



Existential space. A person looking out to sea is oriented to the landscape by the geometry of his body.

Figure 2.2 A person reconciles his orientation in nature, relating physical directions of his body. From *Nature and the Idea of a Man-Made World; An Investigation into the Evolutionary Roots of Form and Order in the Built Environment*, Norman Crowe, (1997), p. 50, Fig. 2.8.

Owing to the expression corresponding to verticality even by means of merely standing, Schmarsow claims that the dimensions of Cartesian axial system he has offered are transformed into spatial construct as a human creation:

> "Before we can speak of the exterior of a building, however, we must establish the further principle of detailed formation by which we relate ourselves to the enclosed interior space. The linguistic terms that we use for space, such as 'extension,' 'expanse,' and 'direction,' suggest continuous activity on our part as we transfer our own feeling of movement directly to the static spatial form. We cannot express its relation to ourselves in any way other than by imagining that we are in motion, measuring the length, width, and depth, or by attributing to the static lines, surfaces, and volumes the movement that our eyes and our kinesthetic sensations suggest to us, even though **we survey the dimensions while standing still**. The spatial construct is a human creation and cannot confront the creative or appreciative subject as if it were a cold, crystallized form."[95]

Schmarsow humanizes and subjectifies space by placing the human body within the idea of space; "The principal concern for architecture as spatial creation is not so much the development of this vertical axis but the enclosure of the subject. Thus the most important dimension for actual space creation is depth. Because of the organization of our body, we always give space a direction; the orientation of the face and limbs

determines what is ahead and whether we are moving forward or backward. In this way direction transforms every spatial enclosure into a 'living space.' Because the whole human body, rather than just our vision, stands at the center of our spatial experience, the minimal standard for the dimension of width coincides with the reach of our arms to the left and right"[96]

In many places of his theory, Schmarsow benefits from Gottfried Semper's theories of "walling motive"[97] and "moment of configurations"[98] (symmetry, proportion,

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[95] Schmarsow, *ibid,* p. 291. Emphases are added.

[96] Mallgrave and Ikonomou, *ibid,* p. 61. Emphases are added.

[97] "The principal concern is always the spatial enclosure of this subject, that is, **the enclosure or walling** in along the sides—not the roofing from above or even the designation and development of the vertical. For a long time this enclosing, this harboring, this **walling** may have taken place under open skies. Spatial constructs of this kind, such as the Greek hypaethral temple and the Egyptian pilgrimage temple, are no less a part of architecture than our own four walls, which we still regard as **the epitome of enclosure**." Schmarsow, *ibid,* p. 291. Emphases are added.

As for Semper, in his chapter titled as, "Structural Elements of Assyrian-Chaldean Architecture", his interest to the "walling motive" has been mentioned under the subtitle "Vertical Space-Enclosure [Assyrian Wall Decoration.]" as follows:

"**The primary material establishing the norm for the vertical enclosure was not the stone wall but a material** that, though less durable, for a long time influenced the development of architecture as strongly as stone, metal, and timber. I mean the hurdle, the mat, and the carpet.

(…) Wickerwork was the original motif of the wall. It retained this primary significance, actually or ideally, when the light hurdles and mattings were later transformed into brick or stone walls. The essence of the wall was wickerwork.

Hanging carpets remained the true walls; they were **the visible boundaries of a room**. The often solid walls behind them were necessary for reasons that had nothing to do with the creation of space; they were needed for protection, for supporting a load, for their permanence, etc." Gottfried Semper, "Vergleichende Baulehre," 1850 (Semper-Archiv at Eidgenössische Technische Hochschule, Zurich, Manuscript Number 58, fols. 94-120), translated as "Structural Elements of Assyrian-Chaldean Architecture" as tenth chapter of "Comparative Building Theory" in <u>*Gottfried Semper; In Search of Architecture*</u>, Wolfgang Herrmann, (Cambridge, Mass.: The M.I.T. Press, 1989), pp. 204-205. Emphases are added.

[98] In his essay "The Attributes of Formal Beauty" where he begins with the definition of Tectonics, Semper describes the "moment of configurations" under the subtitle "The Three Qualities of Formal Beauty: Symmetry, Proportionality, Direction. Fitness of Content the Fourth Quality":

"From these different relationships arise these **three qualities of formal beauty: (1) macrocosmic unit or order (symmetry); (2) microcosmic unit or order (proportionality); (3) unit or order of direction (direction).**

These three formal qualities of beauty are analogous to the three spatial dimensions; as little as one can imagine a fourth dimension, it is just as impossible to add **a fourth quality *homogenous*** with the three mentioned above. Moreover, there is also this universally valid law: *the symmetrical axis is always horizontal and intersects the direction of movement at right angles*. Example: the snake, whose axis of direction coincides with its axis of proportion; its symmetrical axis is normal in relation to the other two and is horizontal. The human figure has three orders of beauty in normal relationship to each other—it is symmetrical, it is proportioned, and it has **unity of direction** [*Richtungseinheit*] according to the direction of the three rectangular spatial coordinates." Gottfried Semper, "Theorie des Formell-Schönen," ca. 1856/1859 (Semper-Archiv at Eidgenössische Technische Hochschule, Zurich, Manuscript Number 179, fols. 1-46), translated into English, introductory part called "Attributes of

direction). In the lecture he has given in 1896 as "Über den Werth der Dimensionen im Menschlichen Raumgebilde" (On the Importance of Dimensions in Human Spatial Creation), Schmarsow adapts axial dimensions to art:

> "(...) the first dimension, or vertical axis, of space predominated in sculpture, the *Körperbildnerin,* or 'shaper of bodies'; the second dimension, or axis of width, predominated in painting, the *Flachengestalterin,* or 'creatress of surfaces'; **the third dimension, or axis of depth, is evident in architecture**, the actual *Raumgestalterin,* or '**creatress of space**.'"[99]

Schmarsow elaborates the principles laid out by Hildebrand and Semper in his later work *Grundbegriffe der Kunstwissenschaft am Übergang vom Altertum zum Mittelalter*[100] (The Basic Principles of the Science of Art at the Transition from Antiquity to the Middle Ages) published in 1905. Influenced by Hildebrand, he parts Spatial Idea from Spatial Form: "(…) the latter [*Spatial Form*] being the representation of the former [*Spatial Idea*]. Spatial Form is most elementarily expressed by the 'four walls' surrounding us. It does not include the roof, because space is not necessarily covered as in courtyards and urban spaces. He comes to the recognition that whatever spatial idea or form man might produce, there will always exist two polarities: the creation of (enclosed) space and its inescapable counterpart the creation of its boundaries, mass."[101]

Another important name in formation of the idea of space is the art historian Alois Riegl who has previously been Herbert's pupil. Riegl develops his theory of *haptic* and *optic space* as based on Zimmermann's distinction between tactile and optic art. He introduces the concept of "Artistic Volition"[102] [*Kunstwollen*] in his book *Stilfragen*

Formal Beauty" in "Theory of Formal Beauty" in *Gottfried Semper*, Herrmann, pp. 228-229. Italics are original. Emphases are added.

[99] Mallgrave and Ikonomou, *ibid,* p. 62. Emphases are added.

[100] August Schmarsow, *Grundbegriffe der Kunstwissenschaft am Übergang vom Altertum zum Mittelalter; kritisch erörtert und in systematischem Zusammenhange dargestellt*, (Leipzig: B.G. Teubner, 1905).

[101] Van de Ven, *ibid*, p. 113.

[102] "Artistic Volition is an urge, which exists *per se*, independent from the material, climatic, geographic circumstances; in short, it proceeds the material-genetic origins stressed by Semper. Riegl saw in the artistic volition an a priori condition that broke completely with the three factors of utilitarian purpose, raw material and technique. He went so far that he called the *Idea of Space*, in whatever form, the source of all artistic volition. Thus he started with great imagination to interpret Greek, Egyptian and

written in 1893, and his theory of tactile and optical ways of seeing[103] in *Spätrömische Kunstindustrie* (Late Roman Art Industry) written in 1901. As for Sokratis Georgiadis, he claims that Riegl's model of movement consisting of near-sighted, long-sighted and normal perspectives has been developed from the lens principle and describes this model as the "frog principle."[104] In line with his understanding of linear history, Riegl sets forth the development of art as transition from haptic to optic: "Although Riegl's theory was based on the bipolar categories of tactile and optical ways of seeing, both were visual qualities that involved only the eye and its movement. By means of this visual scheme, Riegl interpreted art's development from early antiquity to the late Roman period as a transition from tactile to optical modes of perception, or more precisely, from the tactile 'near vision' in the case of the Egyptian pyramid to the purely

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Roman architecture, as the outcome of this a priori urge." Van de Ven, *ibid,* p. 115. Italics are original.

Interpreting the notion of space in relation to the development of Modernism, Solà-Morales Rubió, regards Riegl's *Kunstwollen* concept as a crucial phase of this development: "It was Adolf von Hildebrand who confirmed the relativity of artistic space by demonstrating that our close and distance visions affect objectively different experiences of any work of art. It is the perception of space, therefore, that finally determines the nature of visual experience. Hildebrand's reasoning, subsequently developed by August Schmarsow and Alois Riegl, destroyed Gottfried Semper's explanation of the genesis of the arts on the basis of their material conditions. Schmarsow's notion of *Raumgefühl* established that the moment of perception could not be reduced to purely quantitative, material data. Movement, vision, and touch act together in the production of a global, sentimental experience, which means, for example, that the reality of a work of architecture is inseparable from human perception and its active mechanisms. Riegl subsequently developed the concept of *Kunstwollen,* or artistic will, determining that works of art were such not by virtue of their technical or geographical conditions or by the materials from which they were constructed, as Semper had thought, but as the products of a will—a subjective desire to manifest a vision of the world not through symbols or images but by means of new and changing spatial experiences." Solà-Morales Rubió, *ibid,* pp. 94-95.

[103] Riegl's theory composed of the duality of optic and haptic space is influenced by the distant and near view duality of Hildebrand: "Hildebrand's *Problem of Form* was first published in 1893, in the same year as Riegl's *Stilfragen* (Problem of style), and can be similarly regarded as a response to Semper's theory of style. Hildebrand's work as a sculptor gave his theoretical work authority, and Riegl, who clearly approved Hildebrand's theory,* underscored the struggle with the material as the basic creative gesture. For Riegl, the equivalent of Hildebrand's typological couple, distant and close vision, was the duality of optic and haptic space. Hildebrand described, for instance, how a sculptor chisels a sculpture out of stone and how a clay figure takes shape. (…)

As a result, **the form will receive a unity that exists only in the eye of the beholder and not in reality.** This 'still unity' is the essence of the artistic conception of form and space, which gives the artifact a form shaped by this kind of perception." Moravanszky, *ibid,* pp. 344, 346. Emphases are added. *Alois Riegl, "Naturwerk und Kunstwerk II," in *Gesammelte Aufsätze* (Augsburg: Dr. Benno Filser Verlag, 1929), pp. 65-70.

[104] Georgiadis, *ibid,* p. 115.

optical 'distant vision' of the Roman Pantheon. Between these two developments, we have the 'normal vision' of the Greek temple that reconciled both positions."[105]

In order to render as valid and adapt the concept of artistic volition to all periods, Riegl speculates that this concept attempts a negation of space just as in Egyptians he has given as an example for tactile-near vision: "This fear of space, he assumes, lies at the origin of man facing the external world; but gradually man overcomes this fear, hence he demonstrates a development from the absolute two-dimensional plane toward three-dimensional cubic space."[106]

At the end of the 19th century, two architectural thoughts have been fostered against German Romantic Idealism: the idea of space and the idea of projecting anthropomorphic physiognomy in corporeal mass expressed mostly as empathy of feeling. However, apart from the affirmative considerations of space as approached in these two thoughts mentioned, there were also such ideas and theories that reacted to German romantic idealism and manifested the uncanniness and abhorrence of space. The impact created by Riegl's emphasis on "the fear of space" constitutes a basis for Wilhelm Worringer's theory, where the abstraction has been derived from the existential fear [*Angst*] in his book *Abstraktion und Einfühlung*[107] (Abstraction and Empathy) written in 1908. According to him this *Angst* renders the representation of space as impossible. Worringer's theory is nourished from two resources: the founder of the Institute of Psychology at the University of Munich and the philosopher Theodor

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[105] Mallgrave and Ikonomou, *ibid,* p. 63. Mallgrave and Ikonomou draw attention to the difference between theories of Schmarsow and Riegl: "Schmarsow's criticism of Riegl's theory centered on two basic issues. The first is the marked emphasis on visual perception in Riegl's theory, that is, the neglect of the full bodily and psychic constitution of the human subject. By restraining the observer to a fixed point of view (near, normal, distant), **Riegl deprived the perceiving subject of the freedom of movement through which he can grasp the corporeality of objects and thus experience space**. (…) The second issue on which Schmarsow differed from **Riegl was determining at what historical stage the notion of space became a constituent factor in architectural development**. Riegl maintained that it is only with the rotunda form of the Pantheon and the longitudinal basilica that **inner space became a significant factor in architecture**." Mallgrave and Ikonomou, *ibid,* p. 63. Emphases are added.

[106] Van de Ven, *ibid,* p. 115.

[107] Wilhelm Worringer, *Abstraktion und Einfühlung; Ein Beitrag zur Stilpsychologie* (Munich: Piper, 1908). Translated by Michael Bullock as *Abstraction and Empathy; A Contribution to the Psychology of Style*. (New York: International Universities Press, 1953).

Lipps' writings on theory of psychology of empathy in aesthetics[108] and Riegl's theory of style. With the help of the notion of abstraction he has distilled from Lipps's theory of empathy, Worringer amazingly makes up an opposing pole against empathy: Abstraction.

> "Empathy, on the one hand, represents man's desire to organic, naturalistic form; **abstraction**, on the other, is manifested in the urge of anorganic, crystalline, stylized geometry. The urge to empathy springs from 'a happy pantheistic relationship of confidence between man and the phenomena of the external world.' The urge to abstraction is the outcome of 'a great inner unrest, inspired in man by the phenomena of the outside world.'"[109]

> "If one accepts only the principle of empathy, the geometric form of a pyramid or a Byzantine mosaic could not be determined by the *Kunstwollen* of their respective ages, since our empathy, as 'aesthetic sympathy,' always prefers the organic form. Therefore, argued Worringer, we are dealing in such cases with an urge that is diametrically opposed to empathy—**the urge to abstract**. The art of *Naturvölker* (primitive societies) shows that abstraction is present at the origin of art, and in some highly developed cultures it still dominates. In the culture of ancient Greece, for example, abstraction declined to give place to the urge to empathize. **Empathy and abstraction are basic reactions of humans to their environment.** Empathy, as described by Lipps, requires a joyful, pantheistic, intimate relation to the outside world; in contrast, **the psychological root of abstraction is primordial terror of the wide, unknown world, the tremendous spiritual fear of space**.*"[110]

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[108] "According to Lipps, *Einfühlung* presents itself as an aesthetic sympathy between die artifact and the observer. Lipps explained that the pleasure of **looking at something is an interior process, both a spreading-out and a concentration, an interior moving back and forth—losing oneself in the observation and finding oneself again**. (…) Lipps made a distinction between the moral satisfaction induced by the objective reality, the meaning of the artifact, and the process of observation, which is different: the observer enjoys something that has an ideal content, an objectified ego. Aesthetic pleasure therefore is identical neither with moral satisfaction nor with merely sensual enjoyment.

In the final analysis (and this is also the weakness of Lipps's theory), **empathy is the narcissistic pleasure of the subject in itself**: 'Aesthetic pleasure ... is objectified self-pleasure,' Lipps declared.* **Empathy is therefore a process of self-appreciation; it has to do with the pleasure of power—space, or the freedom of action. Aesthetic pleasure is the space for life encapsulated in an object, while the ugly is its opposite, the negation of life: destruction and death.** §" Moravanszky, *ibid,* pp. 346-347. Italics are original. Emphases are added. *Theodor Lipps, Die ästhetische Betrachtung und die bildende Kunst, (2nd ed., Leipzig: Verlag von Leopold Voss, 1920), p. 103. §Theodor Lipps, Grundlegung der Ästhetik, (3rd ed., Leipzig: Verlag von Leopold Voss, 1923), p. 102.

[109] Van de Ven, *ibid,* pp. 124-125.

[110] Moravanszky, *ibid,* pp. 348-349. *Worringer, *ibid,* p. 76.

Offering a catastrophic picture as an opposition to 19th century's Romantic Idealism, Worringer charges art with the mission to provide serenity for the agoraphobic and alienated man of the chaotic external world. In Worringer's opinion who aims at eliminating the negative characteristics of Modernity, the world of art can realize this therapeutic mission only via the notion of abstraction:

> "(…) 'a residue from a normal phase of man's development at which he was not yet able to trust entirely to visual impressions as a means of becoming familiar with a space extended before him, but was still dependent upon the assurances of his sense of touch.' Man faces an 'extended, disconnected, bewildering world of phenomena,' in short a chaos. He feels lost in the universe. It torments him and compels him to an 'immense need for tranquility, taking the external world out of its arbitrariness, to purify it to its absolute value.' This state of happiness, which he sought in the world of art, is offered to man by abstraction."[111]

> "The spiritual development of Western people, the process of rationalization and adaptation, slowly dissolved the primordial fear. Modern psychiatric illnesses like agoraphobia, however, remind us of that earlier stage of development. In the East the appearance of the world was always considered as a veil; therefore, there was no illusion about the superficiality of intellectual domination of the world. The abstract patterns were like magic spells against fear, appearing as certainties when compared to the blurred character of the world; crystalline and geometric forms promised the greatest joy to people concerned by the confusion and unclarity of phenomena. Avoiding the representation of space is basic to the urge to abstract, because space connects things, establishing relationships, and because space cannot be individualized. As long as an object depends on space, it cannot appear to us as a separate, well-defined entity. Every attempt, therefore, was directed at creating the individual form that is redeemed from space."[112]

In the will to embody dichotomy of abstraction and empathy, Worringer offers Greek art and the Egyptian pyramid as a model.[113] However, he grounds his discourse on the Gothic:

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[111] Van de Ven, *ibid,* p. 125.

[112] Moravanszky, *ibid,* p. 349.

[113] "The criterion of the organic was the harmonic, the balanced, which is in accord with the vital feelings of our organism—its model was Greek art. The opposite principle was exemplified by the Egyptian pyramid, which presented itself as a pure crystalline, abstract form." Moravanszky, *ibid,* p. 350.

> "For Worringer, the apotheosis and fulfillment of expression on a crystalline-inorganic basis was the Gothic: the art of migrating, nomadic peoples of the great empires of the North and East. Scholasticism, similarly, was a culmination of efforts to express intimate religious feelings in abstract-schematic terms. Gothic architecture, exemplified the capacity of empathy to combine with the forces working in the structure in order to achieve an all-embracing intensity of movement that must have appeared barbaric and extravagant to people sympathetic to the antique ideal. (…) **A Gothic structure was abstract but required empathy**; it was mechanical rather than organic. Its extreme, nervous ecstasy, suggested to Worringer that the Middle Ages was Europe's puberty."[114]

As much as he has been influential upon especially Czech cubists by the essays he has written on the Gothic and the theory of Abstraction and Empathy, Worringer also initiates the critics on the spiritual tendencies of the 19th century by his book *Formprobleme der Gotik* [Form Problem in the Gothic] written in 1912 as an indication of preference to Gothic over the Renaissance.[115]

In preface of *Entwicklungsphasen der neueren Baukunst* (Principles of Architectural History) he has written in 1914 depicting the trinity of Wölfflin, Schmarsow and Riegl in the tradition of German art historians all as "godfathers,"[116] Paul Frankl adopts the system of polarities, which Wölfflin has pointed out in his summer lectures in Munich during 1912, for the methodology of his own.[117] Differently from the five polarities Wölfflin has developed to analyze painting and sculpture, Frankl categorizes buildings and architecture into four: spatial form, corporeal form (mass), visible form (light) and purposive intention.

Frankl not only lets these four categories be controlled by the polarities, but also polarizes spatial form as spatial addition and spatial division. Second category, Corporeal form is concerned with mass and its articulations and controlled by the polarities of generator of forces and transmitter of forces;

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[114] Moravanszky, *ibid,* p. 350. Emphases are added.

[115] Georgiadis, *ibid,* pp. 10-11.

[116] Spiro Kostof, "Paul Frankl's Principle of Architectural History" in *On the Methodology of Architectural History*, D. Porphyrios (ed.), *Architectural Design* 51, no. 6-7 (1981), p. 21.

[117] Paul Frankl, *Die Entwicklungsphasen der neueren Baukunst*, (Leipzig: B.G. Teubner, 1914), p. xiv. Translated as *Principles of Architectural History; Four Phases of Architectural Styles, 1420-1900*,

> "To Frankl, generation of force means a mass that appears capable of withstanding external forces. It is self-sufficient. It does not give rise to empathy or anthropomorphic animation; it is itself the centre of force. Its members are characterized by tectonic individuality. Transmission of force, on the contrary, means a mass that is not controlled by itself, but by feelings of unrest, uncertainty and incompleteness. There is a flow of forces between the members as well as between the beholding human being through the process of empathy."[118]

Third category, the Visual Form is controlled by the polarity of "one image-like" perception ("einbildig") and "many image-like" perception ("vielbildig"). Frankl adapts Hildebrand's visual – kinesthetic vision polarity to his own theory. Unlike Hildebrand, Frankl simplifies only "light" among the variable factors (illumination, color, environment, and standpoint of the observer...etc) upon which his effective form depends, and renders visual form as identical with light.

Having referred to Schmarsow's "mole principle" as stationary, Hildebrand's model of movement as linear and uninterreptud, and Riegl's model as the "frog principle," architectural historian Sokratis Georgiadis suggested Frankl's mode of movement as the "spider principle":

> "For Frankl, **the perception of every three-dimensional structure is dependent on a continuously changing point of view. In the case of architecture, this requires movement around the exterior envelope but also through the interior space**. (…) Perhaps the most important of Frankl's innovations was that the direction of movement was no longer clearly or mainly along the axis of depth. In the first chapter of his book *Entwicklungsphasen der neueren Baukunst*, in which he discusses space, he concentrates essentially on analyses of ground plans. Thus Schmarsow's 'rule of the vertical' also ceases to matter. Ground plans present themselves here as **possibilities of equivalent movements in different directions that can be described as circular movements, radiating movements, or movements in length and breadth etc.** The right angle loses its claim to exclusivity. These movements are by no means chaotic or arbitrary, but rather **follow unambiguously definable geometric models. This is the 'spider principle.**'"[119]

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trans. James F. O'Gorman, (Cambridge, Mass.: The M.I.T. Press, 1968). Cited from Van de Ven, *ibid,* p. 150.

[118] Van de Ven, *ibid,* p. 154.

[119] Georgiadis, *ibid,* p. 117. Emphases are added.

Further developing Schmarsow's suggestion to place the beholder in interior and by proposing the movement of beholder to oscillate between both the exterior and the interior, Frankl appears to have prepared Giedion's modern space conception:

> "To see architecture means to draw together into **a single mental image of the series of three-dimensionally interpreted images** that are presented to us as **we walk through interior spaces and round their exterior shell**."[120]

Purposive Intention as the final category of Frankl is controlled by two polarities: centrifugal-centripetal forces and freedom of personality and constraint of personality. "In using this double set of polarities, Frankl ties spatial organization in with the mental state of the client and user."[121] In Frankl's opinion, the purposive intention comprises form of space as much as functional propriety: "Nevertheless, a trace of vanished life remains behind in a building of the extent that **the purpose is incarnated in the form of the space**. This purpose in a very general sense does not include specific incidents."[122] Frankl furthers his argument by stating that this purpose contrues meaning and content to the idea of space:

> "The visual impression, the image produced by light and color, is primary in our perception of a building. We emprically reinterpret this image into a idea of corporeality, and this defines the form of the space within. **Once we have reinterpreted the optical image into an *Idea of space* enclosed by mass, we read its purpose from the *Form of space*. We thus grasp its spiritual import, its content, its meaning**."[123]

Because of his fondness for cultural history just like his teacher Wölfflin, Frankl claims with the help of functional propriety of the building he has defined as purposive intention that art and civilization can be bridged in between:

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[120] Frankl, *ibid,* p. 142. Quoted by Kostof, *ibid,* p. 23. Emphases are added.

[121] Van de Ven, *ibid*, p. 157.

[122] Frankl, *ibid,* pp. 159-160. Reprinted in *On the Methodology of Architectural History*, D. Porphyrios (ed.), *Architectural Design* 51, no. 6-7 (1981), p. 20. Emphases are added.

[123] Frankl, *ibid,* p. 1. Quoted by Van de Ven, *ibid,* p. 158. Italics are original. Emphases are added.

> "Each of these [entertainments] aspects of life forms part of the building programme and, indeed modifies that programme according to the significance that each enjoys. A History of building programmes is therefore part of cultural history, and my task would be easier if studies in cultural history were more advanced although I am concerned only with a *part* of these studies. (...) **The bridge between art and life remained undiscovered**. This bridge is nothing other than **the building programme, the purpose in general**, and for that reason it is difficult to begin with the cultural image, to go from the infinite number of bridges to all aspects of life. To opposite path is easier. **We must begin with art itself and there seek the threads that bind it to civilization in general**. Cultural history is not to be understood as a mere collection of data from public and private life. It is rather, **the ordering of these data round centres of thought that implies change in social expression**."[124]

Frankl gives special importance to architecture in bridging between art and life:

> "People are part of architecture. This too distinguishes architecture from both painting and sculpture, for we do not stand in front of a building but are surrounded by it. **Architecture and people interact**."[125]

This statement of Frankl suggests transformation of architectural history in such a way that it will have common interests with the studies of social behavior and constructions that are of interest of cultural history.

In the Introduction titled "Architecture in the 1960's: Hopes and Fears," which has been added to the 1967 edition his book *Space, Time and Architecture*, Sigfried Giedion, as one of the pupils of Frankl, categorizes the characterization and historicization of the idea of Space in three stages, as can be traced in all his studies:

> "It is easier to understand what is happening in architecture today when it is set into a wider frame of architectural reference. To summarize briefly: There are three stages of architectural development. During the first stage — **the first space conception — space was brought into being by the interplay between volumes**. This stage encompassed the architecture of Egypt, Sumer, and Greece. Interior space was disregarded.
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> **The second space conception** began in the midst of the Roman period when interior space and with it the vaulting problem started to become the highest aim of architecture. The Roman Pantheon with its forerunners marks its beginning. **During the second space conception, the formation of**

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[124] Frankl, *ibid,* pp. 159-160. Reprinted in *Architectural Design*, p. 20. Italic is original. Emphases are added.

[125] Frankl, *ibid,* pp. 159-160. Reprinted in *Architectural Design*, p. 20. Emphases are added.

interior space became synonymous with hollowed-out interior space. Alois Riegl was the first to recognize this. Despite several profound differentiations, this second space conception persisted throughout the period from the Roman Pantheon to the end of the eighteenth century.

The nineteenth century forms an intermediary link. A spatial analysis of its buildings indicates that **elements of all the different phases of the second stage are simultaneously intermingled (Paul Frankl)**. But the earlier spatial unity vanished more and more. Buildings which most truly represented the period were ignored by the public.

The third space conception set in at the beginning of this century with the optical revolution that abolished the single viewpoint of perspective. This had fundamental consequences for man's conception of architecture and the urban scene. The space-emanating qualities of free-standing buildings could again be appreciated. We recognize an affinity with the first space conception. Just as at its beginning, architecture is again approaching sculpture and sculpture is approaching architecture. At the same time the supreme preoccupation of the second space conception—the hollowing out of interior space — is continued, though there is a profoundly different approach to the vaulting problem. New elements have been introduced: a hitherto unknown **interpenetration of inner and outer space and an interpenetration of different levels (largely an effect of the automobile), which has forced the incorporation of movement as an inseparable element of architecture.** All these have contributed to the space conception of the present day and underlie its evolving tradition."[126]

[126] Giedion, *S.T.A.*, pp. lv-lvi.

2.2 Transposition and Incorporation of the Inherited Idea of Space into "New Understandings"

Relating the notion of space becoming the major problem of 20th century architecture to the development of Modernism, Solà-Morales Rubió alleges that avant-garde culture and criticism have played a crucial role as to pave for its way.[127]

On the other hand Giedion, who has always adopted an avant-gardist language,[128] starting with the year of 1917, when he has yet been an art student in Munich writing his lyric works of expressionist character, his cultural manifesto titled "Gegen das ich"[129] ("Against the Ego") and his drama "Arbeit-Drei Akte"[130] ("Work") with his

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[127] "For architecture, the notion of space is linked to the development of modernism. The idea that architecture is the production of post-Euclidean spaces, in accordance with the infinite repertoire of possibilities offered by modern physics, biology, and psychology, exactly parallels the developments to which we have just referred. (…)

This notion of architectonic space was adopted by avant-garde culture and criticism from Adolf Behne to Sigfried Giedion, from Frank Lloyd Wright to Mies van der Rohe, from Picasso to Duchamp. Their proposed spatial innovations were fundamental to the new art born out of the crisis of classicism. Space was no longer perceived as an initial datum, an a priori starting point upon which the architect's work intervened; instead, space itself resulted from an architectonic proposition. Space, and the infinite spatio-temporal experiences that the architect could create, became the final objects of architectural invention. They were not cause but consequence in a universe where relativity—not only physico-mathematical but biological, psychological, and philosophical as well—constituted an entirely new point of view.

This spatial creativity primarily manifested itself psychologically. Close and distant vision, touch, and bodily movement establish the conditions for the experience of space in such a way that the production of new spaces is indissolubly bound with the exploitation of the perceptual mechanisms of the human subject. In the same way that certain currents in the visual arts exploit extreme perceptual conditions in order to obtain new aesthetic effects—sleeplessness artificially stimulated by drugs in surrealism, or the mechanical optical experiences initiated by Duchamp—so too architecture was to find the road to spatial innovation expanded by the exploration of all possible psychological pathways." Solà-Morales Rubió, *ibid,* pp. 94-95.

[128] Georgiadis finds the early example of Giedion's avant-garde language in essays of the drama *Arbeit* written in 1917: "Giedion was already speaking the language of the avant-garde in 1917. The architecture he wanted could be defined negatively by its antipathy towards an attitude that was primarily interested in the outer shell of a building, in its epidermis ('facade-architecture', 'style-architecture', 'academism' were all terms used to describe this phenomenon); by its rejection of ornamentation, already elevated to a systematic programme by Adolf Loos in 1908; by its self-restraint and purity, qualities that had been defended early on by Henry van de Velde. The positive characteristics of this architecture were its objective nature and its respect for materials as determining factors, concepts reminiscent of the statements of the Werkbund in the prewar years. The other stylistic qualities of the sought-for architecture are less clearly defined." Georgiadis, *ibid,* p. 10.

[129] Sigfried Giedion, "Gegen das Ich." *Das Junge Deutschland*, Berlin, no. 8/9, 1918. Reprinted in *Hommage á Giedion: Profile seiner Persönlichkeit*. (Basel: Birkhäuser, 1971).

dissertation entitled *Spätbarocker und romantischer Klassizismus* (Late Baroque and Romantic Classicism) in 1922, he has been under effect of Expressionism that suggests reconciliation of "ratio" and "vision." With the "Gothic" impact it has created, Worringer's *Formprobleme der Gotik,* which has been written in 1912 criticizing the positive approach of 19th century's Romantic idealism, has especially constituted the departure point for both Giedion's essays and the whole architectural movements justifying themselves.[131] Georgiadis claims that after 1922 Giedion paradoxically has taken place within the main proponents of functionalist orthodoxy on the one hand, has held an expressionist narrative and also kept this polarity until the end of his life;

> "Paradoxically, the texts written after 1922 by Giedion, who was considered by many to be one of the main proponents of functionalist orthodoxy, evidence **strong Expressionist elements in their choice of words and style**. Simply juxtaposing these texts and chose of the literature of Expressionist architecture of the Twenties would provide convincing evidence of the validity of this claim. Not only these texts but also Giedion's later development - his openly-admitted scepticism after the Second World War towards the omnipotence of techno-scientific rationality; his rejection of rationalism and the idea of progress; and finally his sharply-

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[130] Sigfried Giedion, *Arbeit-Drei Akte*, (Berlin: Fischer, 1917).

[131] Besides analyzing "the idea of the Gothic" in Giedion's works of "*Arbeit*," "*Gegen das Ich*," and *Spätbarocker und romantischer Klassizismus*, Georgiadis demystifies the symbolic use of "the Gothic model" by Expressionist architects:

"The 'Gothic model' served the Expressionist architects as a symbolic concentration of a whole range of ideological and practical goals:

- in the area of philosophy it served as a counterbalance to the leading theoretical models of the time, 'positivism' and 'materialism', and encouraged the search for a new kind of 'spirituality';
- in the area of culture, it served as a counterbalance to the omnipotence of industrial-technical rationality and led the organisation of a counterattack by craftsmen/artists;
- in the area of architecture, it served as a counterbalance to the classical canon, in terms of both composition and structure, and opened the way to an alternative, spiritualised conception of form and space." Georgiadis, *ibid,* p. 12.

Giedion regards the Gothic period as part of the construction process of modern space conception and hence he adds it to "the tradition of forming interior space":

"One period can penetrate another. **The Gothic straining for height and their structural rib system were carried over into the formation of Baroque domes**. There was **a continuity of principles**, though a great change in the way they were expressed. In its later development, the Roman conception of forming interior space continued on **through the Romanesque and Gothic periods** into the Renaissance (which again studied and re-adopted Roman forms) and on into the Baroque and the nineteenth century.

In the twentieth century we are experiencing **an interweaving of the architectural conceptions of all periods. Attention is again directed to the play of volumes in space without losing the tradition of forming interior space**." Sigfried Giedion, *Architecture And The Phenomena Of Transition; The Three Space Conceptions In Architecture*, (Cambridge, Mass.: Harvard Uni. Press, 1971), p. 2.

> worded demand for the 'right of expression' in the early Sixties — all prove that Expressionist theories had never lost their effect on him."[132]

In his last book *Architecture and the Phenomena of Transition,* which has been published in 1971, three years after his death in 1968, Giedion manifests his scepticism towards rationality openly as follows:

> "In my conclusion to *Mechanization Takes Command*, I pointed to **the coming end of a rational approach** to the world, and our **move away from the one-way street of logic**."[133]

Georgiadis denotes that Giedion has been affected by "a new unity," which has been searched by the 19th century idealist philosopher Friedrich Schelling and the romantic writer Friedrich Schlegel both.[134] Unlike Georgiadis, Joseph Rykwert extends and connects the roots of Giedion's historiography with Hegel and by virtue of his dissertation mentor Wölfflin, he defines Giedion as "the latest representative of the Swiss historical school."[135] As for Panayotis Tournikiotis, he regards Giedion as one of

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[132] Georgiadis, *ibid,* p. 3. Emphases are added.

[133] Giedion, *A.P.T.*, p. 1.

[134] Sokratis Georgiadis dates Giedion's interest in Schelling's writings at around 1936. Sokratis Georgiadis, "Giedions Versuch einer Ästhetischen Theorie der Moderne," exhibition catalogue, *Sigfried Giedion 1888-1968. Der Entwurf einer Modernen Tradition* (Zurich: Ammann Verlag, 1989), p. 22-23. Cited from Detlef Mertins, *Transparencies Yet To Come: Sigfried Giedion and the Prehistory of Architectural Modernity*, (Ph.D. Diss., Princeton Uni. Pr., 1996), p. 189.

[135] As the author of "Intellectual Biography" of Sigfried Giedion, Sokratis Georgiadis alleges that Giedion has constructed the roots of his art-historical approach in a way as to include Burkhardt: "**So he [Giedion] extended his art-historical family tree until he came to Jacob Burckhardt**. This was actually quite skilful of him, for many different art-historical and theoretical paths lead back to Burckhardt. Ten years before *Space, Time and Architecture* appeared, Edgar Wind had showed how it was possible for Heinrich Wölfflin and Aby Warburg, for example, to the same extent and justifiably, to refer to Burckhardt as their mentor, although their careers as well as the art-historical traditions they founded were so different. So the fact that Giedion mentioned Burckhardt does not just signify a free choice but also **a voluntary change in his methodology**. This is further proof that, for Giedion, the histiographical method played a secondary, subordinate role to his concept of architecture. This was a turning point whose implications for architectural theory should not be underestimated." Georgiadis, *ibid,* p. 102. Emphases are added.

Georgiadis re-emphasizes Giedion's invention of his own tradition: "He carried on to explain that he saw himself as **the heir** to an art-historical tradition that could be traced back to Wölfflin and Burckhardt…" Georgiadis, *ibid,* p. 114. Emphases are added.

"The questions which a historian has chosen to ask and the way in which they are related to the problems his predecessors attempted to solve are some guide to his achievement, Sigfried Giedion is **the latest representative of the Swiss historical school**, which was, from its beginning, in opposition to the romantic historiography stimulated by, the teachings of Hegel. Nevertheless the Swiss

the most important founders of genealogies of modern architecture for belonging to German art historian tradition and for "playing a decisive role in shaping the ideology of the modern movement."[136]

When perceived from this originist framework, the formal and analytic methodology developed by historian Jacob Burckhardt as an opposition to Hegel's historicism that emphasizes culture and spirit not only amounts to a transition from idealism to realism, but also steers priority and emphasis into the work of art itself. From the point of view of this approach, pursuing the protagonists of formal and analytic methodology like August Schmarsow, Adolf Hildebrand, and Heinrich Wölfflin, Sigfried Giedion takes place within a similar formal-analytic position. Giedion refers to his protagonists to construct and justify the modern space conception, and the perception model and mode of movement that this conception comprises. However, just as his methodology has differed from that of his mentor Wölfflin's, he differs from the other protagonists and invents new territories.

The influence of Wölfflin upon Giedion is conspicuous not only in his dissertation *Spätbarocker und romantischer Klassizismus*, but also in his later studies.[137] Wölfflin exposes the differences between the different periods as he is interested in the "phenomenon of change." Wölfflin's actual interest was finding the distincts, which Giedion has called as "stylistic" characteristics of different periods, by comparison. Unlike Wölfflin, the interest of Giedion has been on the "phenomena of continuity"[138] that can be extended from present to past and even to future:

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historians were profoundly influenced by him. Burckhadt, the founder of the school, frequently stated his problems in Hegelian terms: he spoke, for instance, of the desirability of formulating the laws of *Formgeschichte*, and his great achievement was his revaluation of the notion of 'style.'" Joseph Rykwert, "Giedion and the Notion of Style", *The Burlington Magazine* XCVI (April 1954), pp. 123-124. reprinted in *Sigfried Giedion: A History Project, Rassegna,* (March 1986), no. 25, p. 88.

[136] Panayotis Tournikiotis, *The Historiography of Modern Architecture*, (Cambridge, Mass.: The M.I.T. Press, 1999), p. 21.

[137] Giedion implies that he could be able to grasp *Zeitgeist* with the help of Wölfflin's "method of contrasting styles": "As an art historian I am disciple of Heinrich Wölfflin. In our personal contacts with him as well as through his distinguished lectures, we, his pupils, learned to grasp the sprit of an epoch. (...) He was delighted in contrasting one period with another." Giedion, *S.T.A.*, p. 2.

[138] "Giedion's first book, *Spätbarocker und Romantischer Klassizismus*, was written as a doctoral thesis in Wölfflin's school; and in it **the method of contrasts and of the autonomy of works of art** is used, not for the refinement of conoisseurship, but almost as a weapon against itself." Rykwert, *ibid*, p. 88. Emphasies are added.

> "Every period concentrates upon certain problems. **Scholars of the nineteenth century concentrated upon intensive studies of individual styles**, though they did not stop there. **Careful comparisons were then made between stylistic periods, so that—by such juxtaposition—the peculiarities of each would become more evident**. *Renaissance und Barock* by Heinrich Wölfflin (1888) may serve as an example of this method.
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> **Such studies formed the background for scholars of the twentieth century**. Men now began, to seek broad relationships, across the barriers of individual states and specific religious or social groupings. **Today we are interested in what it is that great periods have in common** no matter how greatly individual forms may vary. **The problem of continuity is far more important to us than the definition of separate styles and their special characteristics.** To put it another way, in order for us **to establish our position at the present time**—which has closer ties with the whole of the human past than any other period before it—it is essential to understand **the continuity through past, present, and future**."[139]

Giedion determines the two problematic fields as "Present" and "to construe a meaning to it" as the aim of his own historiography: "to establish our position at the present." With regard to this manner, in order to render "present" as meaningful and to preserve "Culture" from collapsing, he attributes causality to many phenomena, no matter related or unrelated, even to "History" itself as correlated events and facts and then converts them into "Eternal Present." Giedion manifests this act of attributing causality explicitly in his first work *Spätbarocker und romantischer Klassizismus* written in 1922:

> "In my own first book. *Late Baroque and Romantic Classicism* (Munich, 1922, written as a thesis), I tried to follow Wölfflin's method. **The periods contrasted** were the end of the eighteenth century and the beginning of the nineteenth, both periods of classicism. (…)
>
> The problem, which fascinated me, was **how our epoch had been formed, where the roots of present-day thought lay buried. This problem has fascinated me from the time I first became capable of reasoning about it until today**."[140]

"Today we consciously examine the past from the point of view of the present to place the present in a wider dimension of time, so that it can be enriched by those aspects of the past that are still vital. This is a matter concerning **continuity** but not imitation". Giedion, *S.T.A.*, p. 7. Emphasis is added.

[139] Giedion, *A.P.T.*, p. 2. Emphases are added.

[140] Giedion, *S.T.A.*, pp. 2-3. Emphases are added.

By using such schismatic concepts as "feeling and thoughts" or "constituent and transitory facts," Giedion adopts Wölfflin's method consisting of dual concepts.[141] He not only depicts art as *Kunstwissenschaft* under influence of Wölfflin,[142] but also gets affected by Jacob Burckhardt's wide view of history in line with such phenomena as "fragments in unity," "the importance of sources and records," "the entirety of an Epoch" and "emphasis on the social construction of the daily life."[143]

However, accusing them of not being interested in their own era, i.e., "present,"[144] Giedion constructs it as a departure point of his own theory. At the same time, he

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[141] "This he [Wölfflin] had demonstrated by using as his example the change in style from the Renaissance to Baroque, using concepts which he grouped together in pairs. In concrete terms, this meant juxtaposing 'linear and painterly', 'the planimetric and recessional', 'closed and open form', 'variety and unity', and 'clarity and obscurity', whereby the first one of every pair of concepts refers to the Renaissance and the second to the Baroque.

(…) Elsewhere, Wölfflin refers to this as his 'optical model' ('optisches Schema'), which Giedion, on the other hand, terms his 'basic shape' ('Urform'). In contrast to this, the 'Formsystem', the classical elements of form, is equivalent to Giedion's 'shade of colour' ('Farbung') or 'robe' ('Gewand'). Having clarified this misunderstanding (due, possibly, to the diverging uses of the concepts 'classic/classical' and 'classicistic' in German and English), it is obvious that Giedion was still functioning within the context of the Wölfflinian paradigm. Within this paradigm, it is necessary to exclude Classicism in order to allow 'late Baroque' (in other words, the last phase of the Baroque tradition) and 'Romanticism' to appear as two diametrically-opposed epochs." Georgiadis, *ibid,* pp. 16-17.

As for Rykwert, he links these schismatic concepts to Hegel: "Such **contrasts** abound in his works; and they are, one feels, not always the most valuable contribution of his **Hegelian heritage**." Rykwert, *ibid,* p. 88.

[142] "Wölfflin always laid stress on the wide view taken by Jakob Burckhardt and often quoted Burckhardt's words not only in his lectures but also in conversation. Thus the Swiss historical tradition formed the basis of **our instruction in the science of art**. [*Kunstwissenschaft*]" Giedion, S.T.A., p. 3. Emphases are added.

[143] "Wölfflin always laid stress on **the wide view** taken by Jakob Burckhardt and often quoted Burckhardt's words not only in his lectures but also in conversation. Thus the Swiss historical tradition formed the basis of **our instruction in the science of art**. (…)

Jakob Burckhardt (1818-1897) was the great discoverer of the age of the Renaissance. He first showed **how a period should be treated in its entirety**, with regard not only for its painting, sculpture, and architecture but for **the social institutions of its daily life** as well. (…)

In *Civilization of the Renaissance* Burckhardt emphasized **sources and records** rather than his own opinions. He treated only **fragments of the life of the period** but treated them so skillfully that a **picture of the whole forms in his readers' minds**." Giedion, S.T.A., p. 3. Emphases are added.

"So that in his first work, by following Wölfflin's method, Giedion inverted the achievement of Burckhardt. Where Burckhardt had demonstrated the internal unity of an Epoch which had been studied fragmentarily, Giedion demonstrated the internal cleavage in a period which had been accorded an apparent unity. Giedion's next book was hardly the thing to be expected after several years spent in research on Italian art of the seventeenth century" Rykwert, *ibid,* p. 88.

[144] "His *Civilization of the Renaissance* aimed at an objective ordering of factual material, but in it his greatest efforts are devoted to **uncovering the origins of the man of today**. (…)

accuses his precedents for characterizing the periods as "Style" as well. Contrarily, because of his belief in being able to construct unity by means of continuity, Giedion has had to confront the problem of ideological historicization.[145]

Although being different from Wölfflin methodologically Giedion sustains the similarity in metaphor, language and narrative:

> "It is no felicitous metaphor to call **art the mirror of life**, and a survey which takes the history of art essentially as the history of expression runs the risk of disastrous one-sidedness. (…) To put it differently—the content of the world does not crystalline for the beholder into an unchanging form. Or, to return to the first metaphor, beholding is just not a mirror which always remains the same, but a living power of apprehension which has its own inward history and has passed through many stages."[146]

> "Looking at a previous era is like **looking at a mirror that can only reflect the features of the observer**. This is unavoidably true for the artist who is selecting images, and—partially at least—even for the educated observer, who can only approach material with the means of perception of his era and cannot avoid being part of the great continuum."[147]

> "**History is a magical mirror. Who peers into it sees his own image in the shape of events and developments**. It is never stilled. It is ever in movement, like the generation observing it. Its totality cannot be embraced: History bares itself only in facets, which fluctuate with the vantage point of the observer."[148]

Jakob Burckhardt had **no love for his own time**: he saw during the forties an artificially constituted Europe which was on the verge of being overwhelmed by a flood of brutal forces." Giedion, S.T.A., pp. 3-4. Emphases are added.

[145] Via establishing parallelism to the futurist painter Umberto Boccioni's "*lo spettatore nel centro del quadro*" (the spectator in the center of the picture frame), Giedion claims that the historian should as well be placed within his own era, i.e., 'present':

"Likewise there are no absolute standards in the arts: the nineteenth-century painters and architects who thought certain forms were valid for every age were mistaken. **History cannot be touched without changing it**.

The painters of our period have formulated a different attitude: *lo spettatore nel centro del quadro*. **The observer must be placed in the middle of the painting, not at some isolated observation point outside**. (…) **to observe something is to act upon and alter it**." Giedion, S.T.A., pp. 5-6. Emphases are added.

[146] Heinrich Wölfflin, *Kunstgeschichtliche Grundbegriffe, das Problem der Stilentwicklung in der neueren Kunst*, (Munich: F. Bruckmann, 1915). Translated by M.D. Hottinger as *The Principles of Art History, The Problem of the Development of Style in Later Art*, (New York: Dover Pub., 1950). p. 226.

[147] Giedion, S.R.K., p. 9. Quoted by Georgiadis, *ibid,* p. 15.

[148] Giedion, M.T.C., p. 2.

Likewise, he acquires the idea from Schmarsow that it is the historian's task and responsibility to guide[149] as much as to understand history:

> "It's right and proper for the historian to confine himself to certain knowledge, even if this is only a starting point along a future path"[150]

> "The historian is not solely a cataloguer of facts; it is his right, and indeed his duty, to pass judgement. His judgements must, however, spring directly from his facts."[151]

> "It is in this field that the historian is not only free to use his judgement but obliged to."[152]

Always being fostered by many different intellectual channels, Giedion is one of rare historians who could integrate the notion of Unity he has been searching for, not only with conceptualization of the History, but also with the historiography of his own. Rykwert's interpretation of his book *Space, Time and Architecture* and Giedion's ability to convincingly establish multiple links between different realms, periods and individuals, are valid for his historiography and even the role he has adopted as an historian:

> "(...) he became **the most important, and indeed the only serious, historian of nineteenth and twentieth-century architecture**. This may seem a far-fetched statement; but **I am not aware of any historian who has been able to weld such a mass of heterogeneous, original, and highly important research into a unified whole**."[153]

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[149] Giedion, not only elasticize the content of each concept based on the *Telos* of Unity, but also redefines the roles of protagonists — from architects to historians — who are influencive in constructing the *Telos*. Giedion charges architecture with the mission of being 'the preserver' of civilization and culture. According to him, architecture has such a power to orient the present and the future due to its presence in life and its close relationship with every field of life. As a natural outcome of this, it should be a must for architects and even for architectural historians who have been charged with this engagement and with the role and the mission of being ' Social Engineers.'

[150] Schmarsow, "The Essence of Architectural Creation," p. 296.

[151] Giedion, *S.T.A.*, p. 18.

[152] Giedion, *S.T.A.*, p. 19.

[153] Rykwert, *ibid,* p. 88. Emphases are added.

While examining the notion of space in Giedion's dissertation *Spätbarocker und romantischer Klassizismus*, Georgiadis deciphers Wölfflin's and Riegl's kinships to the notion of space. According to Georgiadis, the main goal of Wölfflin in *Kunstgeschichtliche Grundbegriffe* has been the limits and limitations of space rather than space itself. Hence, the problem is presented as the space-body contradiction. On the other hand, in his book *Spätrömische Kulturindustrie* where he has developed his space theory dealing with the lens principle, Riegl takes a similar space-body problem into consideration:

> "After all, architecture is a practical art, and its aim has always been to build confined spaces in which human beings should be able to move freely. As this definition teaches us, however, the task of architecture can be split into two parts, which to a certain extent complement and determine each other, and which therefore stand in a certain opposition to one another: the creation of a (confined) space per se and the creation of the limits of this space."[154]

As for Giedion, by applying the unification and synthesis to the space-body contradiction, he produces the modern space conception he will later be naming as Space-time.

As a person who has been influential upon Giedion's historiography, Wölfflin warns in the Preface to the sixth edition of his book *Kunstgeschichtliche Grundbegriffe*, that the historian shall not be interested with the "present" believing that the "phenomenon of change" is valid for "past" periods of history:

> "We know primitively immature modes of vision, just as we speak of "high" and "late" periods of art. Archaic Greek art, or the style of the sculptures on the west portal at Chartres, **must not be interpreted as if it had been created today. Instead of asking 'How do these works affect me, the modern man?' and estimating their expressional content by that standard,** the historian must realise what choice of formal possibilities the epoch had at its disposal. An essentially different interpretation will then result."[155]

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[154] Alois Riegl, *Spätrömische Kulturindustrie*, 2 vols., (1901-1923; Vienna: Österreichische Staatsdruckerei, 1927), pp. 25-26. Quoted by Georgiadis, *ibid,* p. 21.

[155] Wölfflin, *Principle of Art History*, p. vii. Emphases are added.

In line with the idealism of Hegelian *Zeitgeist* concealing the differences, Wölfflin homogenizes and characterizes every epoch. *Zeitgeist,* in Wölfflin's opinion, is a human faculty:

> "(...) as material element—call it temperament, *Zeitgeist,* or racial character—determine the style of individuals, periods, and peoples."[156]

> "**Different times give birth to different art. Epoch and race interact. We must first establish how many general traits a style contains before we can give it the name of a national style in a special sense**. However profoundly Rubens may impress his personality on his landscape, and however many talents may veer to his pole, we cannot admit that he was an **expression of 'permanent' national character** to the same extent as contemporary Dutch art."[157]

While characterizing every epoch via his periodizations on the one hand, with the emphasis he puts on "carried vision,"[158] "permanency," "denominator," "basic visual attitude," and "common style," Wölfflin constructs the path of "continuity" along which Giedion will pursue:

> "And the further question of **how far old products of vision are carried each time into a new phase of style, how a permanent development is commingled with special developments, can only be elucidated by detailed examination**. (…) Finally, **the development is not always synchronous in the different arts**: a late style of architecture can continue to exist by the side of new original notions in plastic or painting, cf. the Venetian Quattrocento, **until finally everything is reduced to the same visual denominator**.
>
> And as the great cross-sections in time yield no quite unified picture, just because **the basic visual attitude varies**, of its very nature, in the different races, so we must reconcile ourselves to the fact that **within the same people —ethnographically united or not—different types of imagination constantly appear side by side**. Even in Italy this disunion exists, but it comes most clearly to light in Germany. Grunewald is a different imaginative type from Dürer, although they are contemporaries. **But we cannot say that that destroys the significance of the development in time: seen from a longer range, these two types re-unite in a common**

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[156] Wölfflin, *Principle of Art History*, p. 11.

[157] Wölfflin, *Principle of Art History*, p. 9. Emphases are added.

[158] "Vision itself has its history, and the revelation of these visual strata must be regarded as the primary task of art history." Wölfflin, *Principle of Art History*, p. 11.

> **style, *i.e.* we at once recognise the elements which unite the two as representatives of their generation**."[159]

> "This idea is best to be obtained in Italy, because the development there fulfilled itself independently of outside influences and the general nature of **the Italian character remains fully recognisable throughout**. The transition from renaissance to baroque is a classic example of how **a new *Zeitgeist* enforces a new form**."[160]

Nevertheless, with the emphasis he puts on "phenomena of continuity and periodicity," Wölfflin appears to have determined not only the path but also the role of an historian to be pursued by Giedion:

> "A further problem, which this book only touches on without examining in detail, is **the problem of continuity and periodicity**. It is certain that **history never returns to the same point**, but it is just as certain that, **within the total development, certain self-contained developments may be distinguished, and that the course of the development shows a certain parallelism**. From our standpoint, namely, the course of development in later times, the problem of periodicity plays no part, but the problem is important, although **it cannot be dealt with merely from the standpoint of the art historian**."[161]

Pursuing along the path opened up by Wölfflin, Giedion gets free of his art historian role undertaking the role of an architectural historian and even cultural historian which brings a requirement to construct various parallelisms with plenty of different fields like art, science, philosophy and architecture for him. Nevertheless, the main problem of Giedion is "present" and "contemporary."[162] According to Georgiadis, this shift in his

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[159] Wölfflin, *Principle of Art History*, pp. viii-ix. Emphases are added.

[160] Wölfflin, *Principle of Art History*, p. 9. Emphases are added.

[161] Wölfflin, *Principle of Art History*, p. vii. Emphases are added.

[162] Georgiadis explicitly manifests the problematics created by Giedion's interest in "present". The shift in historian's interest to "Present" instead of "Past" causes the historical knowledge to become an operationally utilized instrument on the one hand, and results in subjectification of this knowledge, on the other:

> "Giedion's statement that it is the historian's task to 'sort out the various obscure pathways of the present' has, however, a further meaning: historical knowledge was to be turned into an instrument, to be used operationally in the day-to-day architectural 'struggle'. Historical discourse could thereby become a controlling, corrective, clarifying, and finally even a creative force within the newly-established movement. It need not be pointed out that this movement, which served as a point of reference for the new type of historian, could only be an unfinished one, a movement in the process of

interest from art to architecture has provided him the opportunity to pass from being art historian to an architectural historian.

> "In distancing himself from art-historical paradigms, specifically the paradigms of the *fin-de-siecle,* Giedion was not, however, refuting previously held positions. He was questioning neither the content nor the methodology of the existing theories, and had completed his interpretation of past styles by that time. Besides, the influence of his mentor was still too strong. Giedion was establishing his own direction by bringing new developments into the historian's field of view and by declaring these events to be relevant, both to art history and architectural history. On the basis of these new developments he could either take over the old conceptual systems and methods, or expand and enhance them. In this way, Giedion could break away - even at the relatively late -age of thirty-five - from the tradition of academic art history and venture his first steps into the twentieth century. The goal set for itself by at least part of the twentieth-century architectural movement, namely the creation of something completely new, far removed from tradition and any historical ties, offered him a suitable framework within which to work."[163]

With the article "Bauhaus und Bauhauswoche in Weimar"[164] he has written for the journal *Werk* during the Bauhaus exhibition he has visited in 1923, Giedion's interest shifts away from the role of an architectural historian and focuses on "present"[165] in the field of architectural critique. In result, he deals with the European avant-gardists and their architectural works, which have been influential in "present" of his period, determining the direction of all his historiography:

> "The text of this article [Bauhaus und Bauhauswoche], the product of Giedion's direct contact with one of the most important laboratories of new

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becoming. Thus the distinction between the history of art and the creation of art could be discarded. The historian could and should no longer simply register and interpret the past; he had to become a publicist for his own time and a planner for the future. The borders between science and poetry had to become transparent, the claim to objectivity relinquished. Here the break with tradition can be seen most clearly." Georgiadis, *ibid*, p. 36.

[163] Georgiadis, *ibid*, p. 36.

[164] "Bauhaus und Bauhauswoche zu Weimar," *Werk* (Zurich), (September 1923). Reprinted in *Hommage à Giedion. Profile seiner Persönlichkeit* (Basel: Birkhäuser Verlag, 1971), pp. 14-19.

[165] "A whole series of different kinds of function — architectural history, architectural criticism, architectural interpretation — becomes fused together in the process. From this fusion there then grows another function of the historian, perhaps the most important one: that of the **ideologue of current architecture**. To carry out this function convincingly, the historian must be capable of handling currently existing areas of inquiry and able to give convincing answers to the questions raised." Georgiadis, *ibid*, p. 42. Emphases are added.

art and architecture in Europe at that time, was also **his first definitive statement of support for architectural modernity, his first declaration in favour of modern architecture**. His contact with the Bauhaus also gave him occasion to reasses his own role and redefine his relationship to his own discipline"[166]

In his major work *Bauen in Frankreich, Bauen in Eisen, Bauen in Eisenbeton* (Building in France, Building in Iron, Building in Ferroconcrete) written in 1928, six years after his dissertation *Spätbarocker und romantischer Klassizismus*, Giedion takes on a diversity of different roles In his book, considering new materials and techniques like iron and ferroconcrete as new developments, he presents these as new possibilities for the *Gestaltung* (form-giving). On the one side undertaking the role of a messiah, while on the other like an ideologist he claims that these innovations have emerged as a result of historical causality and attempts to historicize the "present."

2.3 Constitution and Characterization of the Modern Space Conception

In *Bauen in Frankreich, Bauen in Eisen, Bauen in Eisenbeton* written in 1928, Giedion deals with a completely different period than his dissertation and shifts his interest from 1830s to 1920s. Giedion's desire for cultural renewal[167] and Le Corbusier's book *Vers Une Architecture* (Towards a New Architecture) published in 1924 have both been of great influence in such a shift of interest:

"And it was **Le Corbusier who, in our talks as well as in his book *Vers Une Architecture* (1924), directed my attention to the sources of contemporary architecture: the iron architecture of the nineteenth century**, which came most strongly to the fore in the great world's fairs. In my book *Bauen in Frankreich* (Leipzig, 1928) I made a first attempt to set this down. The Charles Eliot Norton Lectures (1937-38) enabled me to

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[166] Georgiadis, *ibid*, p. 35. Emphases are added.

[167] "In the turbulent years following World War I Giedion became politically active and supported the Munich *Räterepublik*. (…)

Notwithstanding his excellence preparation for it, an orderly academic career interested Giedion about as much as the management of a textile mill. Instead he cast himself in the role of a comrade-in-arms in and—wherever possible—fellow creator of an admittedly still-vague but all the more passionately desired **cultural renewal**. It was precisely with this aim that he turned toward modern architecture, which received its first, unshakable foundation with *Bauen in Frankreich*." Georgiadis, "Introduction" in *B.F.B.I.B.F.*, p. 2. Emphases are added.

> enlarge on this theme, and to link it with earlier and later developments. These were published as *Space, Time and Architecture* (Cambridge, Massachusetts, 1941; fifth edition, 1967)."[168]

Giedion questions how the "industrial production" that has had profound impacts upon architectural theories of the first quarter of the 20th century will be transforming architectural production and the definition of architecture. He has been profoundly affected by theoretical searches for and practices of "standardization" and "type" initiated in Bauhaus by Gropius, who regards this problem as a departure point of his own theories, and Le Corbusier's works on theoretizing industrial production as the aesthetical language of modern architecture.

Similar to Le Corbusier, with such historical considerations and foresight as to determine how modern space shall conform to modern life, Giedion begins studying the potentials of new materials and techniques and attempts to describe modern architecture via material culture. His point of departure has been the possibilities provided by new materials (iron and ferro-concrete) and techniques (new structural engineering). Because of such possibilities of steel as its thin cross section, its pin-joint connection with the ground, ability to provide more void than mass and solid... etc., Giedion believes in development of a new space conception as to be different from the spatial construction and organization of previous materials. While he analyzes "airy" frame-and-skeletal iron structures like Crystal Palace, Eiffel Tower, Pont Transbordeur…etc. in his book *B.F.B.I.B.F.,* he tries to characterize the modern space conception in context of the new material culture. By this means, he attempts to attain a unification of engineering with architecture in a synthesis.

In this book, Giedion regards the use of iron as a linear rather than a surface element, as an opportunity of freedom that avails for invisibility and void owing to the thinness of its cross section and lack of corporeality. Likewise, in those places where iron is to be used, he sees its ability to be "perforated" as an opportunity providing for ingress of air, in other words, of void as the main element of his modern space conception, into volumes (Figure 2.3);

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[168] Giedion, *A.P.T.*, p. 1. Emphases are added.

"The bleacher rows that are **perforated** and cut in order to **achieve lightness enable new effects through light, structure, material variety**."[169]

"The interplay of the units can be judged neither spatially nor plastically. Only relations count. **Relation of mass to void. Relation of smooth surfaces to perforated ones**, **relation of horizontal layers to vertical bodies**. Colors serve to lighten the volumes, to advance and recess surfaces"[170]

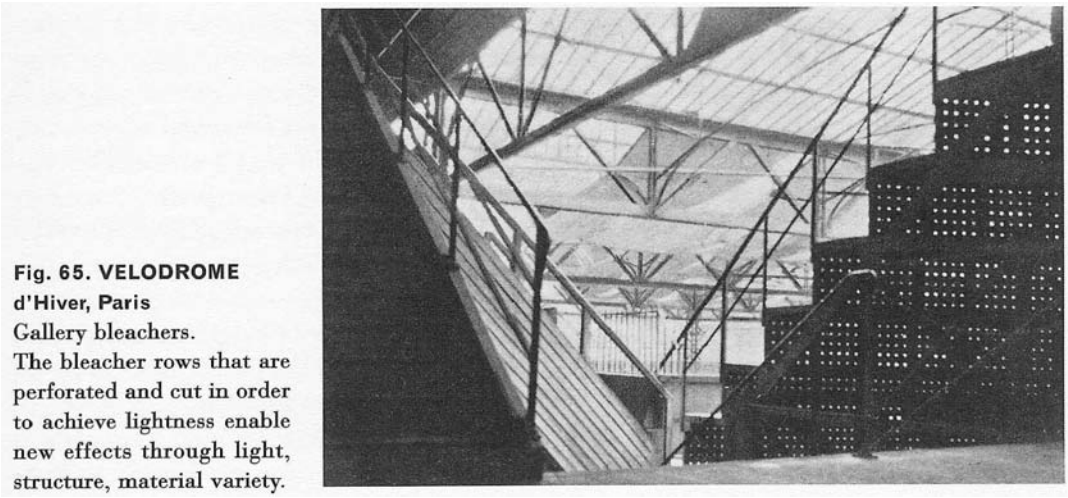

Fig. 65. VELODROME d'Hiver, Paris
Gallery bleachers.
The bleacher rows that are perforated and cut in order to achieve lightness enable new effects through light, structure, material variety.

Figure 2.3 A photograph by Sigfried Giedion of Vélodrome d'Hiver, Paris. Giedion's caption reads, "The bleacher rows that are **perforated and cut in order to achieve lightness enable new effects through light, structure, material variety**." From *B.F.B.I.B.F.*, Sigfried Giedion, (1995 [1928]), p. 149. Emphases are added.

In the book *B.F.B.I.B.F.*, the materials of iron and glass are presented as tools of dematerialization, which, as creators of the void, create an image of void against the solid where air can freely circulate within. Thus, the main characteristic of modern space turns out to be a dematerialization technique providing at least for a visual continuity of air movement and of the void.

[169] Giedion, *B.F.B.I.B.F.*, p. 149. Caption of Fig. 65.

[170] Giedion, *B.F.B.I.B.F.*, p. 176.

Giedion invents many auxiliary concepts to theoretize characteristics of the "void" and "continuity of air movement within void" as those of modern space. In his book *B.F.B.I.B.F.,* he links "interpretation" (*durchdringung*) to movement of the subject and derives it as a perceptional concept as equipped by concepts of void and continuity of air movement within the void.

In the book, the first illustration note for the figure of "Pont Transbordeur (1905) and Harbor of Marseilles" gives the hints for the plurality of meanings Giedion will be loading upon his modern space conception he will later be naming as Space-time (Figure 2.4): "mobility," "suspended cable structure" as a new construction technique, "traffic," "the unity of the building and the urban," "interplaying and floating," "blurred boundaries" and "interpenetration" characteristics.

Fig. 1. PONT TRANSBORDEUR (1905) and HARBOR of MARSEILLES
A mobile ferry suspended by cables from the footbridge high above the water connects traffic on the two sides of the harbor. This structure is not to be taken as a "machine." It cannot be excluded from the urban image, whose fantastic crowning it denotes. But its interplay with the city is neither "spatial" nor "plastic." It engenders floating relations and interpenetrations. The boundaries of architecture are blurred.

Figure 2.4 Giedion's photograph of the Pont Transbordeur over the Marseilles harbour, 1905, engineer Ferdinand Arnodin. From *B.F.B.I.B.F.*, Sigfried Giedion, (1995 [1928]), p. 90.

"When the new building materials —iron and ferroconcrete— assume the forms of gravity and 'monumentality,' they are essentially misused.

It seems doubtful whether the limited concept of 'architecture' will indeed endure.

We can hardly answer the question: What belongs to architecture? Where does it begin, where does it end?"[171]

Giedion uses the answer for describing a new circumstance and lists the characteristics to constitute the new definition of architecture:

"Fields **overlap**: walls **no longer rigidly** define streets. The street has been transformed into **a stream of movement**. Rail lines and trains, **together with** the railroad station, form **a single whole. Suspended** elevators in **glazed** shafts belong to it just as much as the insulating filling between the supports. The antenna **has coalesced** with the structure, just as the **limbs of a towering steel frame enter into a relationship with city and harbour**. Tall buildings are bisected by rail lines. **The fluctuating element becomes a part of building**."[172]

"A **mobile** ferry **suspended by cables** from the footbridge high above the water connects **traffic** on the two sides of the harbor. This structure is not to be taken as a 'machine.' It cannot be excluded from **the urban image**, whose fantastic crowning it denotes. But its **interplay** with the city is neither 'spatial' nor 'plastic.' It engenders **floating relations** and **interpenetrations**. **The boundaries of architecture are blurred**."[173]

According to Hilde Heynen, who has examined the way Giedion referred to the concept of "interpenetration" in his work titled *Architecture and Modernity*,[174] the actual aim of Giedion was *Neues Bauen* as his major interest and the new kind of spatial experience offered by this new architecture:

"Giedion's fascination with these structures arose from the sensation of motion and from the experience of an intermingling of spaces. The description of the Eiffel Tower, for instance, emphasizes the unique effect

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[171] Giedion, *B.F.B.I.B.F.*, p. 90. Emphases are added.

[172] Giedion, *B.F.B.I.B.F.*, p. 91. Emphases are added.

[173] Giedion, *B.F.B.I.B.F.*, p. 90. Caption of Fig.1. Emphases are added.

[174] Hilde Heynen, *Architecture and Modernity; A Critique*, (Cambridge, Mass.: The M.I.T. Press, 1999)

> of a 'rotating' space that is produced by climbing the spiral flights of steps. Exterior and interior spaces are as a result constantly related to each other, to such an extent that in the end one cannot make any clear distinction between the two. This new kind of spatial experience is fundamental in the New Building."[175]

With his statements as "a fluid transition of things"[176] and "the oscillating relations between things,"[177] Giedion suggests integration by means of such concepts as interpenetration and interlocking, while proposing such boundlessness and transgression that involves disintegration, fragmentation, dissolution and dematerialization and presents the unity of determination and indetermination within a simultaneous framework of synthesis. What renders this synthesis possible is the adaptation of the characteristics of air with indefinite boundaries by its nature, to the modern space conception in a way thought to be interlocked by means of analogy. On the other hand, by using the dematerialization technique, he utilizes both incorporeality of linear iron and transparency of glass to eliminate the boundaries. Owing to this technique of analogy and dematerialization, the eye moving within the fragmented elements of the cube which, the material characteristics have been rendered indefinite, does not run into any sense of enclosure or interruption. With the help of such an uninterrupted visual perception, the beholder produces a mentally-constructed space image made up of the assemblage of fragments (Figure 2.5);

> "By their design, all buildings today are as **open** as possible. **They blur their arbitrary boundaries. Seek connection and interpenetration**.
>
> In the **air-flooded** stairs of the Eiffel Tower, better yet, in the steel limbs of a *pont transbordeur*, we confront the basic aesthetic experience of today's building: through the delicate **iron net suspended in midair stream things**, ships, sea, houses, masts, landscape and harbor. **They loose their delimited form**: as one descends, **they circle into each other and intermingle simultaneously**."[178]

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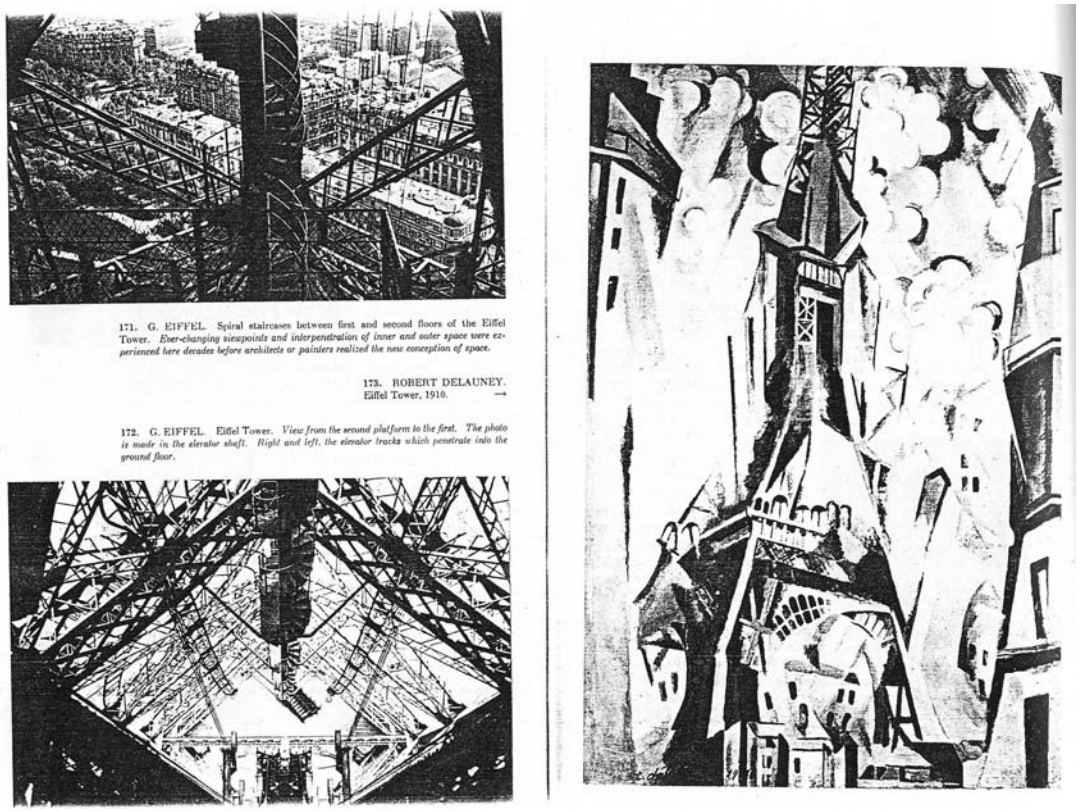
[175] Heynen, *ibid,* p. 30.

[176] Giedion, *B.F.B.I.B.F.*, p. 91.

[177] Giedion, *B.F.B.I.B.F.*, p. 176.

[178] Giedion, *B.F.B.I.B.F.*, p. 91. Italics are original. Emphases are added.

"The roof is completely **integrated into the organism** of the house. The house is no longer a structure whose gable happens to have been shaved off. **It is opened on all sides and finally lost the closure of cubic armor**."[179]



171. G. EIFFEL. Spiral staircases between first and second floors of the Eiffel Tower. *Ever-changing viewpoints and interpenetration of inner and outer space were experienced here decades before architects or painters realized the new conception of space.*

173. ROBERT DELAUNEY. Eiffel Tower, 1910. →

172. G. EIFFEL. Eiffel Tower. *View from the second platform to the first. The photo is made in the elevator shaft. Right and left, the elevator tracks which penetrate into the ground floor.*

Figure 2.5 Parallelism between Giedion's photographs within the Eiffel Tower and Robert Delaunay's painting of Eiffel Tower of 1910. Spiral staircases between first and second floors of the Eiffel Tower (left, above) described as "Ever-changing viewpoints and interpenetration of inner and outer space were experienced here decades before architects or painters realized the new conception of space." From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), pp. 286-287.

In *B.F.B.I.B.F.* where he has attempted to construct modern space conception, Giedion emphasizes the spatial possibilities rather than the temporal characteristics of the notion of movement, which has become one of the characteristics of modern space since Schmarsow, Hildebrand, Riegl and Frankl.

[179] Giedion, *B.F.B.I.B.F.*, p. 181. Caption of Fig. 111. Emphases are added.

> "What is required? 'Freedom of movement, fresh air (*le grand air*), light, broadest prospect.' This demand for a CLEAR LAYOUT [*Übersichtlichkeit*] and the possibility of quick MOBILITY, which only the new materials could provide, are common to all the new building problems."[180]

Georgiadis claims that there have been four modes of movement affecting the development of the idea of Space: Schmarsow's stationary "mole principle," Hildebrand's linear and uninterrupted movement, Riegl's jerky "frog principle" and Frankl's transgressive "spider principle." In Georgiadis' opinion, Giedion takes one step ahead of Frankl and breaks away the Renaissance idea of space and the mode of movement;

> "Frankl's idea of movement, by eliminating the exclusivity of depth (the traditional means of producing the third dimension), was the most complicated there had been up until that time. Giedion went one step further. In contrast to Frankl's conception of movement, Giedion's idea (rooted in modern art and architecture) **no longer had any fixed geometrical structure; movement could no longer be described in terms of geometry**.
>
> **The resulting space is no longer the product of an orderly sequence of movements**. Giedion's concept of space, which he attributed to modern architecture and first saw manifested in painting, especially in Cubism, **broke away from the centuries-old Renaissance idea of space**, an idea that was three-dimensional, dependent on perspective, requiring the motionless, fixed and static point of view of the observer."[181]

In the new concept of space he has termed as "Space-time," Giedion bases his approach on Le Corbusier's transformative and revolutionist subject-object relationship that is proposed in his architecture and in its spatial experience as *Promenade Architecture*. With the help of this approach, movement is associated with subject and "perception" of the continuity of the void is rendered dependent on movement of the subject:[182]

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[180] Giedion, *B.F.B.I.B.F.*, p. 112. Capitals are original.

[181] Georgiadis, *ibid,* p. 118. Emphases are added.

[182] "If, as Giedion believed, Cubism really did mean the simultaneous depiction of the multiplicity of views of an object, based on a fluctuating point of observation, then the obvious question to be asked is how this concept can be transferred to architecture. On the one hand, architecture is tied to three-dimensionality — it does not just depict three-dimensional objects which change their shape with the help of impressions of movement, it actually creates three-dimensional objects on its own. On the

> "When Wölfflin discusses Baroque interiors, his descriptions are almost indistinguishable from Giedion's description of the Space-Time experience of the Villa Savoie. 'We move round them,' he writes, 'because in the intersections new pictures constantly arise. The goal cannot lie in a final revelation of the intersected form—that is not even desired—but in the perception, from as many sides as possible, of the potentially existing views.'
>
> Nevertheless, Giedion's interpretation of Baroque dearly differs from Wölfflin's in that Giedion sees Baroque only as the anticipation of Space-Time."[183]

Just as Frankl, Hildebrand and Schmarsow with their suggestions transforming the object-subject relationship, his teacher and mentor Wölfflin has as well been influential in preparation of the theoretical bases of Giedion's modern space conception:

> "In the staircase of a rich rococo chateau, we do not look for the solid, enduring, concrete form of the lay-out, but surrender to **the rhythm of the changing views**, convinced that these are not fortuitous by-products, but that, **in this spectacle of never-ending movement, the true life of the building is expressed**.
>
> Bramante's St. Peter's as a circular building with cupolas would also have yielded **many views**, but those which were painterly in our sense would have been, for the architect and his contemporaries, **the meaningless ones. Being was the essential, not the pictures shifted this way or that**. In the strict sense, **architectonic architecture could acknowledge either no standpoint of the spectator—certain distortions of the form always being present—or all**: painterly architecture, on the other hand, always reckons with the beholding subject, and hence does not in the least desire to create buildings which may be viewed from all standpoints, such as Bramante worked out for his St. Peter's; it restricts the space at the spectator's disposal so that it may the more certainly achieve the effects it has at heart."[184]

Giedion constructs the relationship that he thinks as the basic characteristic of modern space between movement and interpenetration (*durchdringung*) via statements of "fluidity," "movement of the air" and "freedom of movement," i.e., "boundlessness." He succeeds in unifying the mobility of the air provided by the state of boundlessness in case of Eiffel tower with the multiple view provided by the mobility of the beholder in

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other hand, the optical perception of architecture has always — not just since the modern movement — required a change of position, meaning that the observer has to move." Georgiadis, *ibid,* p. 119.

[183] Peter Collins, *Changing Ideals in Modern Architecture; 1750-1950*; (Montreal: McGill University Press, 1967); p. 293.

case of Pont Transbordeur.[185] Hence, he converts the boundlessness and transgression and free circulation of air into multiple views acquired by means of mobility of the beholder, that is, into his perception theory based on mobility.[186] The "open construction" and "ungraspable total effect" characteristics of the Eiffel Tower have been similarly mentioned in El Lissitzky's article "A. [rt] and Pangeometry" in 1925:

> "The opinion has continued to prevail, even up to the present time, that A. [Art] is something which is created for all eternity, which must therefore be indestructible, heavy, massive, hewn in granite, cast in bronze. The Pyramid of Cheops. The Eiffel Tower is not monumental, for it was not built to last for ever, but as an attraction for a World's Fair; it is not a solid unbroken mass, but a tapering column in **open construction**; here we are citing **a work whose total effect is certainly not easy to grasp**. But for us monumental does not imply a work which will stand there for a year or a hundred years or a thousand years, but the perpetual expansion of human achievement."[187]

Paradoxically while constructing the concept of interpenetration, Giedion begins to simultaneously draw the limits and restrict the content of the concept. Besides sharpening the difference between "interpenetration" and "breaking off from ground," he renders the concept as European. In his book *Space, Time and Architecture,* while discussing the concept of interpenetration via *Plan Libre* as one of the Five Points of Le Corbusier, beyond rendering the concept belonging to Cubism, Giedion renders it as European as to denote his difference with Frank Lloyd Wright;

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[184] Wölfflin, *Principle of Art History*, p. 64.

[185] Giedion summarizes this in caption of Fig. 62 in *B.F.B.I.B.F.,* p. 174.: "Plenty of new visual possibilities: everything is based on mobility."

[186] "(…) he exchanges the roles of the object and the observer. To put it more precisely, the intention that underlies the construction is no longer crucial. The observer — that is his perspective — stands at the centre of events, something Giedion was later to describe in a quote from (and possibly misinterpretation of) Umberto Boccioni with the words 'lo spettarore nel centro del quadro'. The observer does not allow himself to be influenced by the compositional geometry of the building, but rather lets his gaze constantly change its perspective in order to obtain insights that are, perhaps unavoidably, unintentional. By this means, Giedion created a *perceptive apparatus* that was independent of the particular object. This apparatus can move in any direction, can be accelerated or decelerated, can enlarge or diminish, isolate or construct relationships." Georgiadis, *ibid,* pp. 57, 60. Italics are original.

[187] El Lissiztky, "A. and Pangeometry" in *Europa-Almanach* (1925), eds. Carl Einstein and Paul Westheim, reprinted in *El Lissitzky: Life, Letters, Texts*, Sophie Lissitzky-Küppers, ed., (London: Thames and Hudson, 1980), pp. 352-358; passage quoted from p. 357.

> "The same means allowed him to **hollow out** large portions of the house, and to bring about **interpretations of outer and inner space** which are unfamiliar and daring.
>
> This whole treatment, the completely free and individualized organization of separate stories, is what is meant by **'open planning' or *le plan libre*. By now the difference between the open planning of Frank Lloyd Wright and that of European architects should be apparent**. The work of the latter was based upon **the new conception of space as essentially many-sided which grew out of cubism**."[188]

With the claim that not being a pathbreaker constructor like August Perret who has been inspired from construction materials, Giedion accuses Wright in a way of not being an avant-garde. When he compares with Perret's success of "knowledge of how to design an open transition from house to garden"[189] in the villa he has realized at Versailles in 1926, he finds Wright's approach affirmative only for his depart from the widespread romanticism in America, providing for being "able to architecturally to design an unpathetical, self-evident way of living."[190] For this reason, he considers the influences of Wright, more than Wright himself, as crucial for development of modern architecture. For reasons of breaking off from the brick construction tradition and use of concrete in Netherlands, he depicts Rob van't Hoff's house built at Huis ter Heide close to Utrecht in 1915, as "Independent treatment of Lloyd Wright's influence. The horizontal concrete slabs are attached to the house like wings, **without the cube itself being permeated by cubes of air**"[191] (Figure 2.6). On the other hand, he criticizes Wright's lately designs for not being able to break off from ground;

> "…fantastically shaped 'residential yachts,' or houses that **burrow back into the folds of the earth**. There are constantly recurring features of a generation of architects in whom the divided soul of the last century survives: historical burden and constructional interpenetration."[192]

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[188] Giedion, *S.T.A.*, pp. 524-525. Emphases are added.

[189] Giedion, *B.F.B.I.B.F.*, p. 160, esp. fn 78 and p. 179, Caption of Fig.110.

[190] Giedion, *B.F.B.I.B.F.*, p. 160.

[191] Giedion, *B.F.B.I.B.F.*, p. 168. Caption of Fig. 86. Emphases are added.

[192] Giedion, *B.F.B.I.B.F.*, p. 167. Emphases are added.

Giedion also sharpens the boundary between interpenetration and *free plan*. In context of Le Corbusier's La Roche house, he clarifies the difference between the use of interpenetration in Wright's *free plan* and Le Corbusier's *plan libre*; He explains how Wright could not have broken off from ground with the *free plan* on a horizontal plane[193] contrarily to what Le Corbusier has realized 3D interpenetration on a vertical plane between the stories with *plan libre*;

> "The La Roche house in Auteuil of 1924. **The spheres of the stories interpenetrate one another**. Just as Lloyd Wright —twenty years earlier— fused the rooms of the skin off the house and to expose in the naked skeleton itself how **the structural parts flow seamlessly into one another**. Spaces and light, interior and exterior stream together."[194]

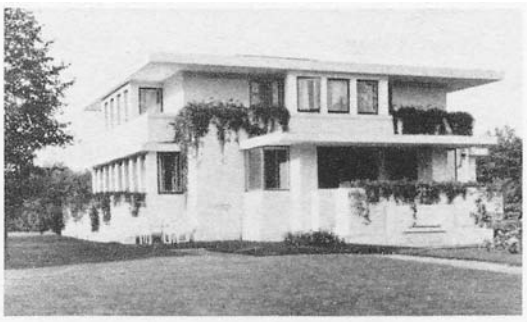

Fig. 86. ROB. VAN 'T HOFF: House in Huis ter Heide near Utrecht 1915. (Concrete)
Independent treatment of Lloyd Wright's influence. The horizontal concrete slabs are attached to the house like wings, without the cube itself being permeated by cubes of air.

Figure 2.6 House in Huis ter Heide near Utrect, 1915, architect Robert van't Hoff. From B.F.B.I.B.F., Sigfried Giedion, (1995 [1928]), p. 168.

[193] "In his houses Wright takes the traditional flat surfaces and dissects them in strips horizontally organized and in a juxtaposed play with solid volumes, his vertical chimneys penetrating the roof in opposition to the horizontal planes of the cantilevered porches and overhanging eaves, thus giving the exterior of the American house an expression synonymous with its plan. He dissects the wall and puts it together again with an unprecedented — after all, we are in the first decade of the twentieth century — keenness of imagination. He is impelled unconsciously by the same forces that worked in Europe about ten years later; there, however, the concern was to explore new penetrations of inner and outer space rather than, as with Wright, to treat the house as an enclosed spatial unit." Giedion, S.T.A., p. 413.

[194] Giedion, B.F.B.I.B.F., p. 180.

In this sense, interpenetration begins to express interlocking of interior and exterior spaces not only horizontally, but also vertically. With the suggested "indivisibility," interpenetration gradually provides diminishing boundaries in the relationship of spaces with respect to one another, in the connection between mass with the ground, and among the elements constituting the contours. By inverting the state of "not breaking off from the ground" he has used to criticize Wright, Giedion converts it into a potential for overcoming gravity;

> "Greatest possible overcoming of gravity. Light proportions. Openness, free of flow of air: things that were first indicated in an abstract way."[195]

Giedion proposes transparency and interpenetration to overcome "the traditional gravity of the houses" he regards as a problem. With the analogy he has made in the illustration note for a Purist painting by Jeanneret in 1924, Giedion constructs this connection;

> "Just as **transparent objects interpenetrate** in the painting, so Corbusier with every means also **lightens the traditional gravity of the house**." [196]

The boundlessness of Eiffel Tower resembling a scaffolding construction is presented by Giedion as a synthesis of "Konstruktion wird Gestaltung" [Construction becomes Form] where the space-body contradiction is dissolved,[197] and as a model for concepts of transparency and interpenetration (Figure 2.7). By this way, as also

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[195] Giedion, *B.F.B.I.B.F.*, p. 93.

[196] Giedion, *B.F.B.I.B.F.*, p. 170. Caption of Fig. 88. Emphases are added.

[197] "The iron skeleton has found its true form.
A play of enormous forces is held in equilibrium.
But not rigidly, like support and load, rather, almost floating.
It is the equilibrium of a balance beam daringly poised against continually varying forces.
A new oscillating harmony is created.
An elastic counterpoise is achieved with respect to changes within, without, and in the foundation:
Equilibrium with respect to change in its own molecular structure.
Equilibrium with respect to external pressure (wind, snow).
Equalization with respect to the surface fluctuations (foundation).
CONSTRUCTION BECOMES EXPRESSION.
CONSTRUCTION BECOMES FORM [Konstruktion wird Gestaltung]." Giedion, *B.F.B.I.B.F.*, p. 142. Capitals and emphases are original. Giedion thinks of the title of his book firstly as *Konstruktion wird Gestaltung,* but later on he changes it as *Building in France, Building in Iron, Building in Ferro-Concrete*. Georgiadis, *ibid,* p. 45.

expressed by Heynen, architecture is based on a "structural logic" resembling the frame-and-skeletal iron construction:

> "This expression [Konstruktion wird Gestaltung] perfectly sums up his basic idea: architecture is no longer concerned with representative facades and monumental volumes; instead, its aim is to design new relationships based on a structural logic."[198]

> "Mies van der Rohe's studies for two country houses (1923), one in brick and one in concrete are of inestimable importance for the development of modern architecture. The analytical spirit of Theo van Doesburg had enabled him to show by means of his transparent architectural drawings that **the conception of the house as a self-contained cube had lost its meaning**. In these two studies, Mies van der Rohe gives this conception a clear and concentrated artistic expression."[199]

On the other hand, against the 'schism' since the 19th century upon the opposition of the massiveness of stone to the linear incorporeality of iron,[200] Giedion proposes to unify such concepts as "contour" and "perforation." For Giedion, contour corresponds to an apparatus which provides both for "dematerialization of solid demarcation" and for the "indivisible space" owing to the air passing through within. Despite the fact that in his Purist painting in 1924, Charles-Edouard Jeanneret (Le Corbusier) has expressed the bottles and glasses reduced to their contours as "transparent objects interpenetrate in the painting," he sees Cubist painting as the origin of "floating transparency" (Figures 2.8, and 2.9).

What is definite in Giedion's historiography, particularly in *Space, Time and Architecture*, is the thought to spread the new materials and constructional methods which the first implementations have been in public buildings widely also in housing

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[198] Heynen, *ibid,* p. 35.

[199] Giedion, *S.T.A.*, pp. 590-591. Emphases are added.

[200] For the contradiction in between "Scaffold Styles" and "Mass Styles" see, Sokratis Georgiadis, "Introduction" in *B.F.B.I.B.F.*, pp. 2-57, esp. pp. 4-39. See also, Carl Bötticher, "Das Prinzip der hellenischen und germanischen Bauweise hinsichtlich der Übertragung in die Bauweise unserer Tage," *Allgemeine Bauzeitung* 11 (1846) pp. 111-125; Edited and translated by Wolfgang Herrmann as "The Principles of the Hellenic and Germanic Ways of Building with Regard to Their Application to Our Present Way of Building," in *In What Style Should We Build? The German Debate on Architectural Style* (Santa Monica: The Getty Center for the History of Art and the Humanities, 1992), pp. 147-167.

and private areas.[201] In context of his ideological argument as such, Giedion expounds how the structural logic of the scaffolding construction and the concept of contour can be adapted to architecture via the Pessac housing settlement which has implemented by Le Corbusier (Figure 2. 10);

> "Corbusier's houses are neither spatial nor plastic: air flows through them! Air becomes a constituent factor! Neither space nor plastic form counts, only RELATION and INTERPENETRATION! There is only **a single, indivisible space**. The shells fall away between interior and exterior.
>
> Yes, Corbusier's houses seem thin as paper. They remind us, if you will, of the fragile wall paintings of Pompeii. What they express in reality, however, coincides completely with the will expressed in all of abstract painting. We should not compare them to paper and to Pompeii but point **to Cubist paintings, in which things are seen in a floating transparency**, and **to the Purist [Charles-Edouard] Jeanneret himself**, who as architect has assumed the name Le Corbusier. In his *Peinture moderne* ([Amedee] Ozenfant and Jeanneret, *Peinture moderne.* Editions Gres & Co.) he likes to assure us that he has deliberately chosen only the most ordinary bottles and glasses, that is, the most uninteresting objects, for his pictures so as not to detract attention from the painting. But the historian does not see this choice as accidental. For him the significance of this choice lies in the preference for **floating, transparent objects whose contours flow weightlessly into each other**. He points from the pictures to the architecture. Not only in photos but also in reality do **the edges of houses blur**." [202]

[201] Giedion motivates especially the avant-garde pathos of 1920s he has been in close contact with on the one side, and by virtue of his cultural and social engagements, he causes these to become widespread and be normalized, on the other.

[202] Giedion, *B.F.B.I.B.F.*, p. 169. Italics and capitals are original. Emphases are added.

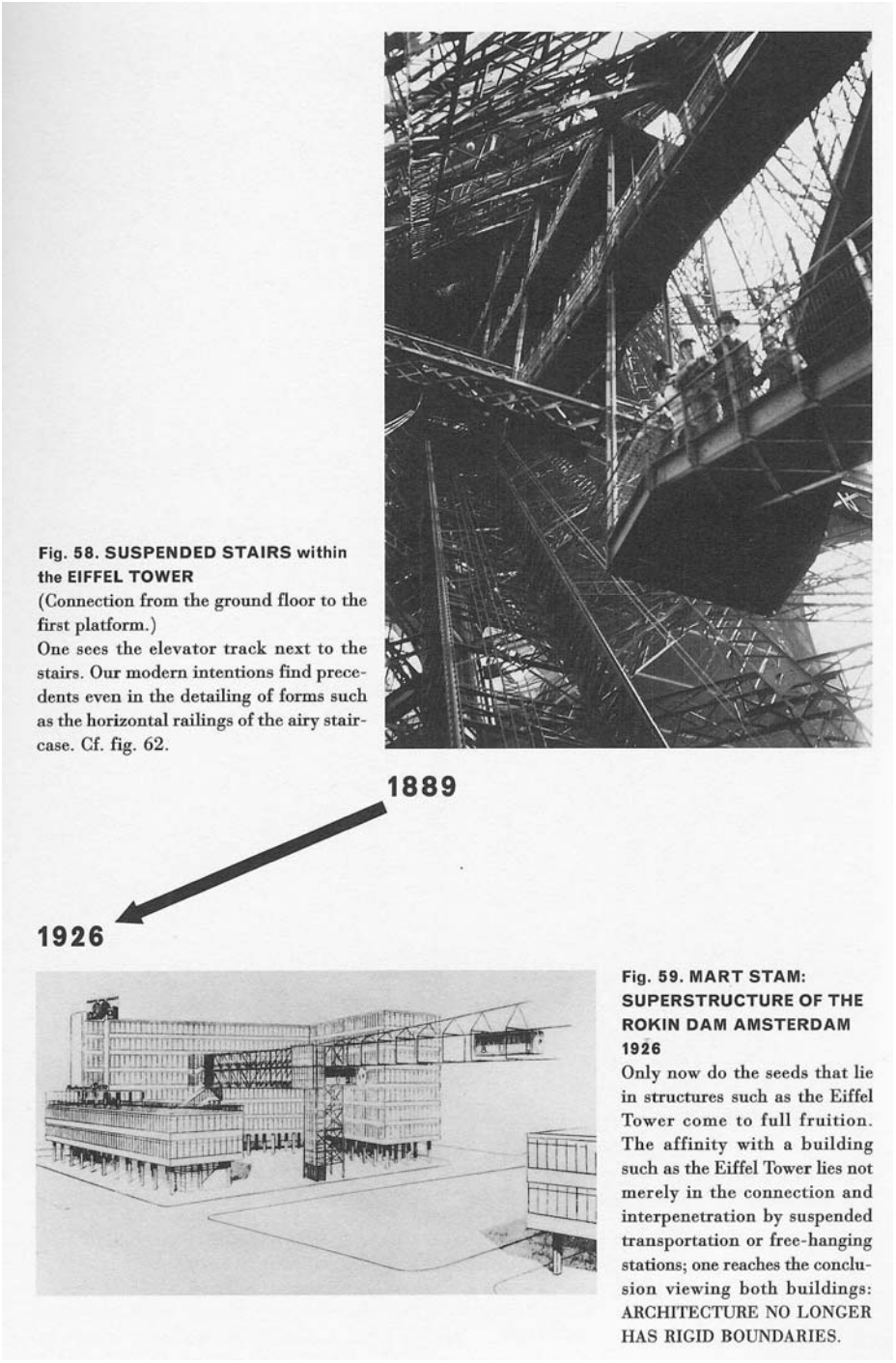

Figure 2.7 The analogy between suspended stairs of the Eiffel Tower of 1889 and Mart Stam's Superstructure of 1926. The "airy" lifts of the Eiffel Tower is confronted with the suspended railways of Mart Stam's scheme for the redevelopment of the Rokin Dam in Amsterdam. Reinforcing with the black arrow, two images are analogically connected with each other. Giedion characterizes the morphological affinities between the Eiffel Tower and Stam's scheme as "(…) Architecture no longer has rigid boundaries." From *B.F.B.I.B.F.*, Sigfried Giedion, (1995 [1928]), p. 145.

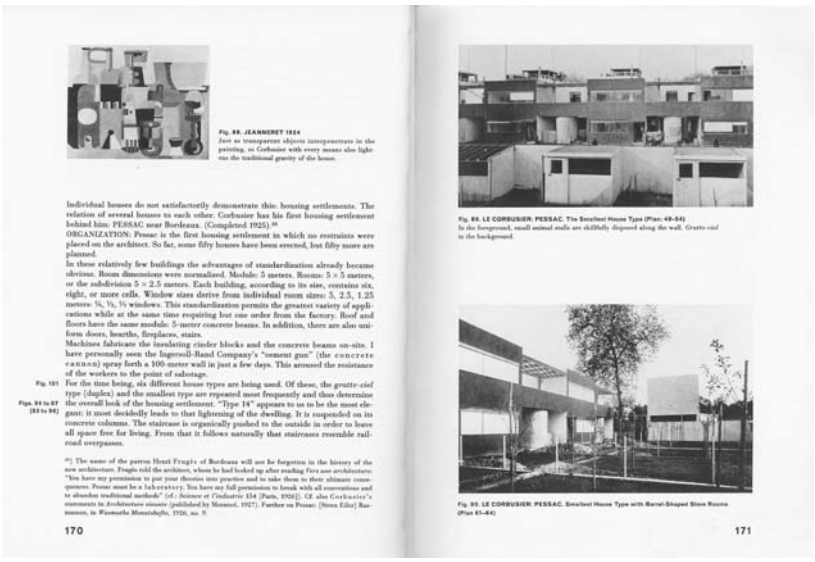

Figure 2.8 Parallelism between Charles-Edouard Jeanneret's painting "Still Life for Pavillion de l'Esprit Nouveau" of 1924 and photographs by Sigfried Giedion of Le Corbusier's Frugès Housing, Pessac-Bourdeaux, France of 1924-1927. From *B.F.B.I.B.F.*, Sigfried Giedion, (1995 [1928]), pp. 170-171.

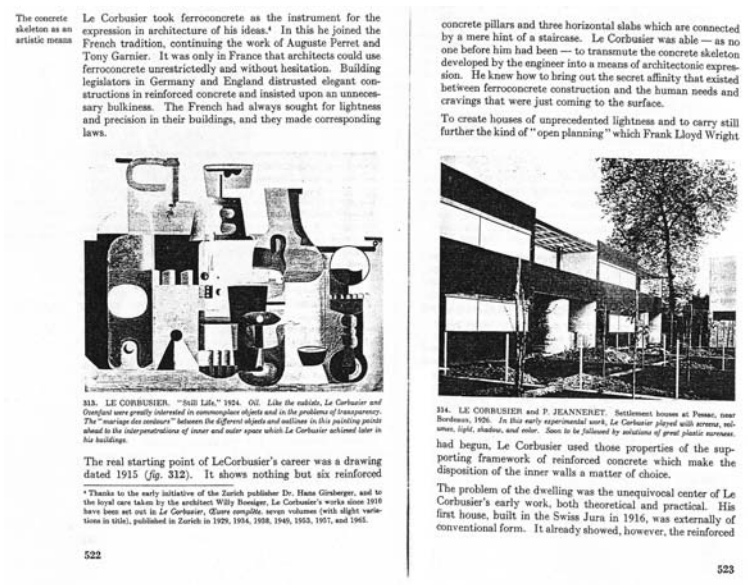

Figure 2.9 Parallelism between Jeanneret's *Still Life* painting of 1924 and a photograph by Sigfried Giedion of Le Corbusier's Frugès Housing, Pessac-Bourdeaux, France of 1924-1927. *Still Life* described as "Like the cubists, Le Corbusier and Ozenfant were greatly interested in commonplace objects and in the problems of transparency. The 'marriage of contours' between the different objects and outlines in this painting points ahead to the interpenetrations of inner and outer space which Le Corbusier achieved later in his buildings." From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), pp. 522-523.

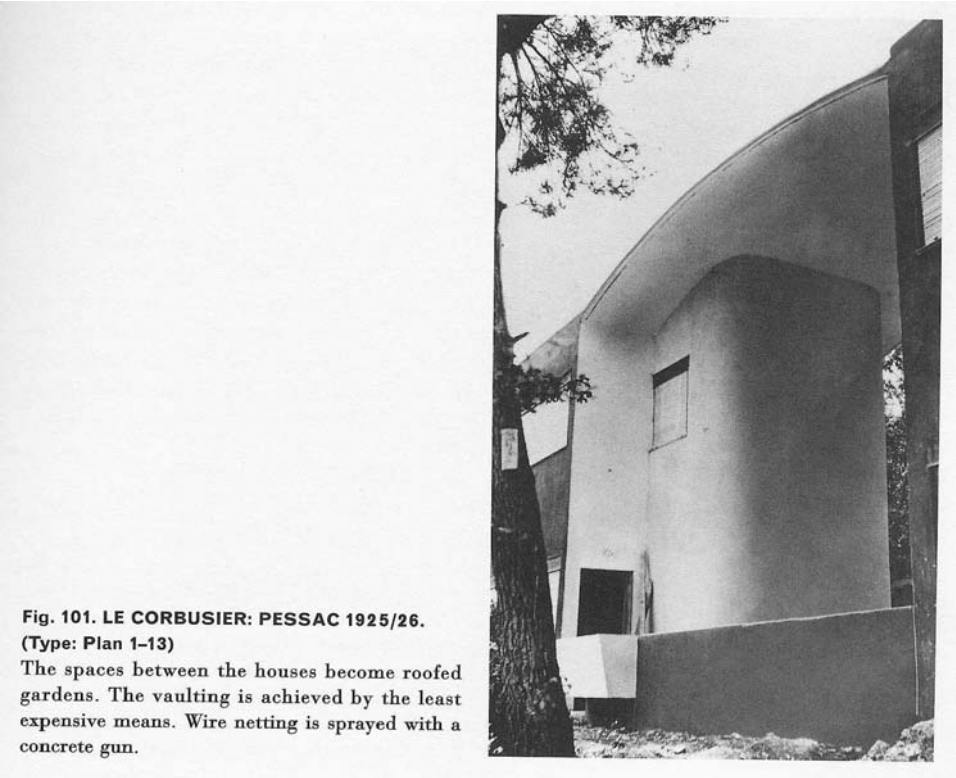

Fig. 101. LE CORBUSIER: PESSAC 1925/26.
(Type: Plan 1–13)
The spaces between the houses become roofed gardens. The vaulting is achieved by the least expensive means. Wire netting is sprayed with a concrete gun.

Figure 2.10 A photograph by Sigfried Giedion of Le Corbusier's Frugès Housing, Pessac-Bourdeaux, France of 1924-1927. From *B.F.B.I.B.F.*, Sigfried Giedion, (1995 [1928]), p. 175.

> "**The flat contours of Pessac merge with the sky**: the suspended canopies over the roof gardens form **the transition**. The colour scheme is taken from Jeanneret's paintings: ethereal sky blue and light green, a more intense brown."[203]

Giedion repeatedly exemplifies "perforation," the other concept he has found for attributing the feature of interpenetration to mass (Figures 2.11, 2.12 and 2.13). Giedion uses the concept perforation not only for expressing the voids in facade, but also for the holes in sheet-metal[204] or atriums in interior space (Figure 2.14). However, for the Bon Marché Department Store plan he has used in *B.F.B.I.B.F.*, Giedion does not refer to the

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[203] Giedion, *B.F.B.I.B.F.*, p. 176. Emphases are added.

[204] See Figure 2.3 in this Chapter; "The bleacher rows that are **perforated and cut in order to achieve lightness enable new effects through light, structure, material variety**." Giedion, *B.F.B.I.B.F.*, p. 149. Caption of Fig. 65. Emphases are added.

concept of perforation, while in *S.T.A* where he uses the same figure once again, he includes the following statement: "The 'perforated' interior space is typical of French buildings" (Fig. 2.11 and 2.12). In order to adapt interpenetration to mass, he makes use of "perforation" as a design tool by implying both the contrast of enclosure and openness of atriums or courtyards;

> "This building [Gropius's American Embassy in Athens] expresses the outcome of a general development since 1911 which is not confined to Walter Gropius. It is expressed not in a negative approach but in pressing forward solutions to once-opened problems: **the relation between enclosure and perforation**, between differentiation and a more distinct repetition of single parts, and the ability of the architect to integrate all these elements into a spiritual entity."[205]

In example of Pessac Houses depicted by him as "as thin as paper"[206] and "eternally open,"[207] proposing "movement of air" and dematerialization, Giedion produces the concept of "interpenetration" within the manner as perforation and "melting into air";[208]

> "(…) his [Le Corbusier] city on concrete piers, the suspended houses that toward the base appear to become ever lighter, **the cubes of air** that spill over into his apartment houses (the first of these buildings, which are essentially villas set on top of one another, is to be built in Frankfurt), the gardens on the roofs and sides. **Cubes of air within, cubes of air without**. Cubes of air down to the very smallest units at Pessac and the individual cells of a *cité universitaire*. **Maximum of air, minimum of walls**.
>
> **This flow of air through the house: inside, outside, below, above** (the flat roof is but a partial problem in a larger unity): this is what we demand from the new house!"[209]

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[205] Giedion, *S.T.A.*, p. 515. Emphases are added.

[206] Giedion, *B.F.B.I.B.F.*, p. 169.

[207] Giedion, *B.F.B.I.B.F.*, p. 168.

[208] Marshall Berman characterizes Modernity through the dematerialized features with simultaneous and unlimited movement between destruction and construction expressed by Marx by his statement "all that is solid melts into air." For the transitory aspect of the Modernity considerations in modern architecture see also Heynen, *ibid,* pp. 9-24.

[209] Giedion, *B.F.B.I.B.F.*, pp. 168-69. Italics are original. Emphases are added.

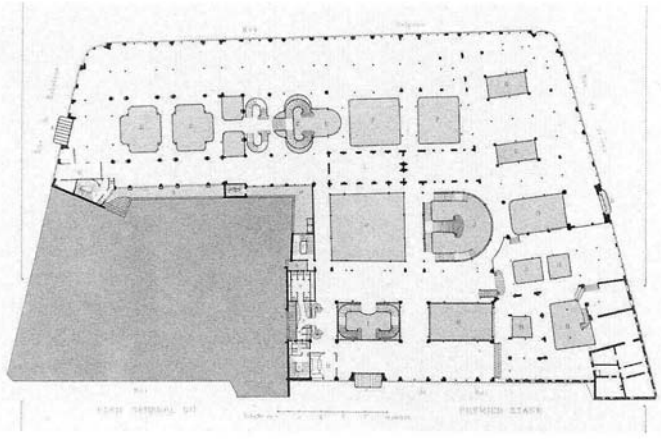
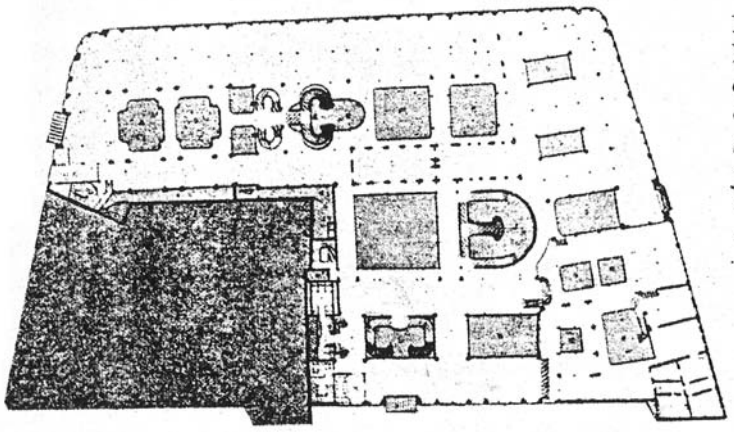


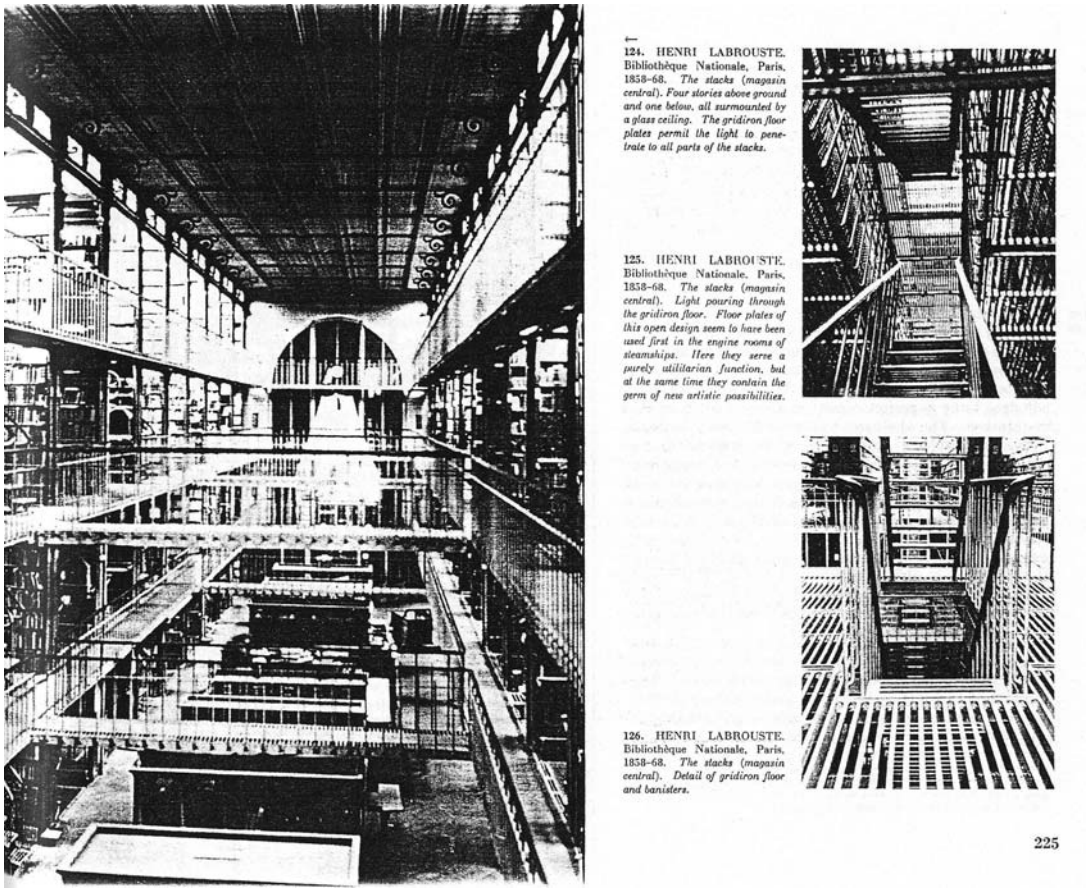
Fig. 22.
BON MARCHÉ DEPARTMENT STORE. Plan
First iron-and-glass department store. Surface area: 10,000 square meters.

Figure 2.11 Plan of the Marché Department Store, Paris, 1876, architect Louis-Charles Boileau and engineer-constructor Gustave Eiffel. From *B.F.B.I.B.F.*, Sigfried Giedion, (1995 [1928]), p. 116.



139. EIFFEL and BOILEAU. Bon Marché, Paris, 1876. *Ground plan. Area, thirty thousand square feet. The "perforated" interior space is typical of French buildings.*

Figure 2.12 Plan of the Marché Department Store, Paris, 1876, architect Louis-Charles Boileau and engineer-constructor Gustave Eiffel. The accompanying text reads: "The '**perforated**' interior space is typical of French buildings." From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), p. 240. Emphasis is added.



124. HENRI LABROUSTE. Bibliothèque Nationale, Paris, 1858–68. *The stacks (magasin central). Four stories above ground and one below, all surmounted by a glass ceiling. The gridiron floor plates permit the light to penetrate to all parts of the stacks.*

125. HENRI LABROUSTE. Bibliothèque Nationale, Paris, 1858–68. *The stacks (magasin central). Light pouring through the gridiron floor. Floor plates of this open design seem to have been used first in the engine rooms of steamships. Here they serve a purely utilitarian function, but at the same time they contain the germ of new artistic possibilities.*

126. HENRI LABROUSTE. Bibliothèque Nationale, Paris, 1858–68. *The stacks (magasin central). Detail of gridiron floor and banisters.*

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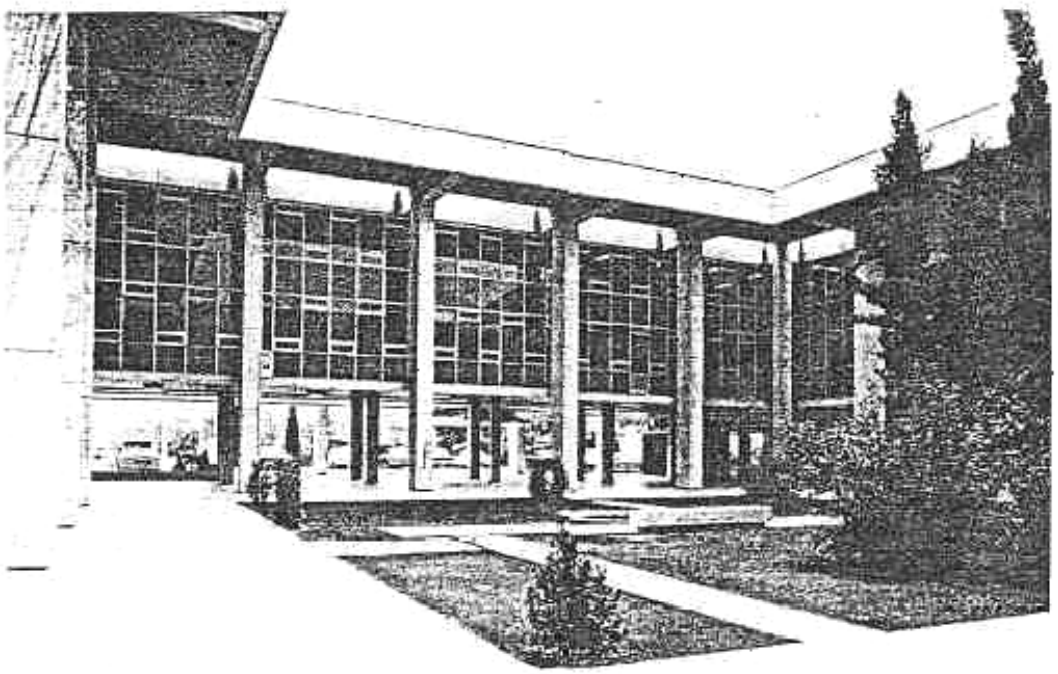
Figure 2.13 Bibliothèque Nationale, Paris, 1858-1868, architect-constructor Henri Labrouste. The stacks in the central magazine of Bibliothèque Nationale (fig. 124 left) described as "Four stories above ground and one below, all surmounted by a glass ceiling. **The gridiron floor plates permit the light to penetrate to all part of the stacks**" and the detail photograph of gridiron floor (fig. 125 right above) described as "**Light pouring through the gridiron floor**. Floor plates of this open design seem to have been used first in the engine rooms of steamships. Here they serve a purely utilitarian function, but at the same time they contain the germ of new artistic possibilities." From *Space, Time, and Architecture*, Sigfried Giedion, (1967 [1941]), pp. 224-225. Emphases are added.



310. American Embassy, Athens, 1956–61. *The perforated interior court. The architectural structure, interior and exterior, is identical on all four sides: continuous squared columns, projecting cornice, wide air vent, set-back glass walls. The photograph shows the degree to which the interior court is opened up and the direct relationship between the interior and the exterior.*

Figure 2.14 Walter Gropius's American Embassy in Athens of 1956-61. Giedion describes the inner courtyard of U-shaped building as "perforated." From *Space, Time, and Architecture*, Sigfried Giedion, (1967 [1941]), p. 517.

Giedion makes a last turn converts the fundamentals of the modern space theory into perception of the mobile subject and the "impressions" acquired, i.e., a subjective assemblage by eliminating its material and corporeal characteristics:

> "Despite the heaviness of the particular details of the design, **the eye**, through the interplay of the various horizontal surfaces, **has an impression of the air always separating and hovering**, just as our future cities will be shaped."[210]

[210] Giedion, *B.F.B.I.B.F.*, p. 163. Emphases are added.

> "There arises—as with certain lighting conditions in snowy landscapes—that dematerialization of solid demarcation that distinguishes neither rise nor fall and that gradually produces **the feeling of walking in clouds**."[211]

From then on, what renders space as unified is the "perception" of a circulating and collecting eye. Rendering the integrity of form to "seeing," Giedion interprets Le Corbusier's De Monzie House as follows:

> "…it would be only the kind of luxury shown in the de Monzie house: luxury of air volumes whose interpenetration and harmony let **the new way of SEEING become form**."[212]

As a solution to the representation problem of impressions of spatial experience and the perception of the mobile beholder he has converted into subjective assemblage, Giedion suggests film or cinematographic assemblage that structurally involves mobility and time. For the representation of non-perspectival and multipointed view he has suggested, Giedion finds new inventions in optics that is appropriate to truly represented multifacetedness of "reality":

> "He conflated this with theories of image-formation coming from the, discourse of 'new optics' in the late 1920s—in which new worlds were seen to appear through the expansion of vision made possible by scientific instruments, airplanes, photography, and film."[213]

In his discussion for the Pessac housing development by Le Corbusier, Giedion transforms the film into some kind of apparatus, which represents "the sense of space":

> "These houses that so rigorously respect the planar surface are themselves being penetrated with expansive, onrushing cubes of air, which among themselves receive new stimulation and modulation—as by swelling, visually hard-to-discern vaults (pantries). The row houses as a whole again reach into the space next to behind them. **Still photography does not**

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[211] Giedion, *B.F.B.I.B.F.*, p. 169. Emphases are added.

[212] Giedion, *B.F.B.I.B.F.*, pp. 168-69. Capitals are original. Emphases are added.

[213] Mertins, "System and Freedom," p. 216. For the effects of airplane and photography see also, Adnan Morshed, "The Cultural Politics of Aerial Vision: Le Corbusier in Brazil (1929)", *Journal of Architectural Education*, no. 55/4, (May 2002), pp. 201-210.

capture them clearly. One would have to accompany the eye as it moves: only film can make the new architecture intelligible!"[214]

Owing to his reception of Space-time notion, which he has produced both to construct and dissolve modern space, as an experience dependent upon mobility and perception, Giedion thinks that they could be represented only by means of a similar representation apparatus. Hence, Giedion transforms "four dimensional"[215] spatial experience itself into a cinematographic assemblage. Once this is realized, the logic can be easily inverted: space can be organized within a cinematographic assemblage, i.e., by its montage features. Sharing similar anxieties just like Le Corbusier, Robert Mallet-Stevens tends to see the relationship between architecture and film beyond representation of architecture, as spatial experience itself. One of the interesting relationships between architecture and cinema is the film *Les mystères du château du dé* (1928) which is ordered to Man Ray by Noailles about Villa Noailles that is realized by Mallet-Stevens in Hyères. Art historian Hubert Damish expresses how the motion of gaze and body are converted into camera movements and how the camera experiences architecture as follows:

> "His film starts with a wide-angle, 360-degree pan of the terrace, with its openings on the outside, and then ignores the Mediterranean landscape to shuffle into the house, through its corridors, staircases, and tunnels, and raise the eye toward the stained-glass grid that corresponds to the sky of the great salon. Here the handheld camera slowly slides over the metallic grids on which the collection of paintings was stored and, turning upside down, finally ends up back on the terrace. It is a dramatic circular move that echoes the pan of the terrace and also turns the building upside down."[216]

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[214] Giedion, *B.F.B.I.B.F.*, p. 176. Emphases are added. Georgiadis differently translates the same statement from German: "Static pictures do not provide any clarity. We have to be able to follow the transformations of our own gaze. **Only film can make sense of the new architecture.**" Georgiadis, *ibid*, p. 60. Emphases are added.

[215] "To a previously unknown extent, outer and inner space are interpenetrating. This effect can only be experienced in descending the spiral stairs [of Eiffel Tower] from the top, when the soaring lines of the structure intersect with the trees, houses, churches, and the serpentine windings of the Seine. The interpenetration of continuously changing viewpoints creates, in the eyes of the moving spectator, a glimpse into **four-dimensional experience**." Giedion, *S.T.A.*, p. 284. Emphases are added.

[216] Hubert Damish, "Three Minus Two, Two Plus One: Architecture and the Fabric of Time" in *Anytime*, Cynthia C. Davidson, ed., (Cambridge, Mass.: The M.I.T. Press, 1999), pp. 84-88.

According to Beatriz Colomina, the self-question asked by visitors of Villa Noailles expresses a similar sense of displacement: "human question: where are we?"[217] For Giedion, there exists a similar impression of space in the spiral stairs of Eiffel Tower that makes a revolving movement as well: the senses of "displacement" and "disorientation" that accompany "shock" and "bewilderment" that has never been experienced before. Le Corbusier quotes how he has cinematographically assembled a similar sense of displacement experience in Villa Savoye:

> "The visitors, till now, turn round and round inside, asking themselves what is happening, understanding with difficulty the reasons for what they see and feel; they do not find anything of what is called a 'house.' They feel themselves within something entirely new. And ...they are not bored, I believe!"[218]

Colomina's question of "where we are?" broadens the horizon intellectually. Such expressions as dissolution of the cube, deformation of forms of daily objects by Cubist painters, fusing contours and blurring architecture…etc., amount to the deformation, dematerialization or dissolution or vanishing of the relations in between familiar objects, places, images and phenomena. Resembling all avant-gardes, the act of Giedion to alienate the familiar one through letting it subjected to dissolution or dematerialization as an act of providing place for the "shock" and the "new." With the help of Space-time he has proposed as an instrument of displacement and alienation, Giedion avails for this new experience:

> "Painters very different in type but sharing a common isolation from the public worked steadily toward a new conception of space. And **no one can understand contemporary architecture**, become aware of the feelings hidden behind it, unless he has grasped the spirit animating this painting."[219]

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[217] Beatriz Colomina, "Where Are We?", in *Architecture and Cubism*, Eve Blau and Nancy J. Troy, eds., (Cambridge, Mass.: The M.I.T. Press, 1997), p. 141.

[218] Le Corbusier, *Précisions sur un état présent de l'architecture et de I'urbanisme* (Paris: G. Crès, 1930), p. 136. Quoted by Colomina, *ibid,* pp. 141-142.

[219] Giedion, *S.T.A.*, p. 433. Emphases are added. Stating this as "the spirit animating this picture," here Giedion uses a similar expression as the terminology of Hildebrand and Wölfflin: "(…) The void exists not as something externally limited but rather as something internally animated." Hildebrand, *ibid,* p. 239, see also fn. 64 in this chapter and "(…) Forms become meaningful to us only because we recognize in them the expression of a sentient soul. Instinctively we animate each object." Wölfflin, *Prolegomena to a Psychology of Architecture,* pp. 151-152. See also, fn. 73 in this chapter.

Giedion suggests the proposal of oscillating relations constructed among surfaces, lines and air by Mondrian and Van Doesburg to substitute the anthropomorphic order gathering the architectural elements together, to construct the new proportion formulae of modern architecture[220] (Figures 2.15 and 2.16). While this formulae melts all the boundaries on the one hand, in context of proposing a new order, it causes them to be oscillated between "system" and "freedom" known as the fundamental problem of all early avant-gardes, on the other.[221] As cited from Matei Calinescu's book *Five Face of Modernity*,[222] Detlef Mertins expounds the state of *aporia* between system and freedom of avant-garde as follows:

> "The quest of 1920s rationalist architecture may in turn be understood as responding to a related problematic inscribed into the history of cultural avant-gardism, seeking to resolve the opposition between freedom and system identified by Matei Calinescu as the 'irresolvable contradiction between the supposedly courageous nonconformism of the avant-garde and its final submissiveness to blind, intolerant discipline'—the *aporia* of an avant-garde wanting to be free and yet demanding regulation…In the 1860s, Charles Baudelaire was the first to point out that this notion of the avant-garde harbored a tension between radical artistic freedom and programmatic political campaigns modeled on war, between critique, negation, and destruction, on the one hand, and dogma, affirmation, and construction, on the other—in short, between freedom and system."[223]

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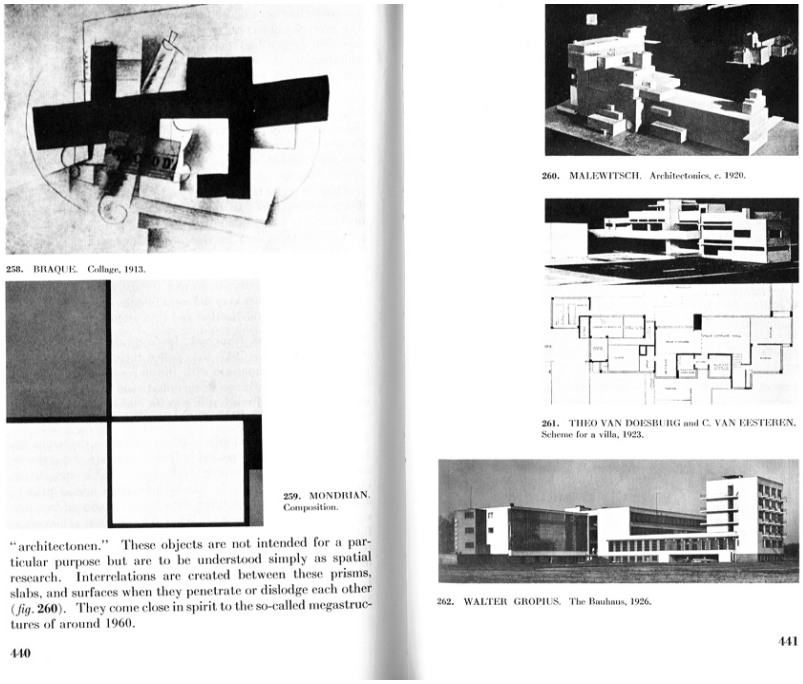
[220] The name of the small booklet Giedion has written in 1929 is a well-expressed proof of his quest: Sigfried Giedion, *Befreites Wohnen: Licht, Luft, Öffnung* [Liberated Dwelling: Light, Air, Openness] (Zurich & Leipzig: Grell Füssli, 1929)

[221] "*History is not a compilation of facts, but an insight into a moving process of life*. Moreover, such insight is obtained not by execlusive use of the panoramic survey, the bird's-eye view, but **by isolating and examining certain specific events intensively, penetrating and exploring them in the manner of close-up. This procedure makes it possible to evaluate a culture from within as well as from without**." Giedion, "Foreword to the First Edition", in *S.T.A.*, p. vi. Italics are original. Emphases are added.

[222] Calinescu, *ibid*, see the chapter "The Idea of the Avant-garde," pp. 95-148.

[223] Mertins, "System and Freedom," pp. 227-228.



258. BRAQUE. Collage, 1913.

259. MONDRIAN. Composition.

"architectonen." These objects are not intended for a particular purpose but are to be understood simply as spatial research. Interrelations are created between these prisms, slabs, and surfaces when they penetrate or dislodge each other (*fig.* **260**). They come close in spirit to the so-called megastructures of around 1960.

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260. MALEWITSCH. Architectonics, c. 1920.

261. THEO VAN DOESBURG and C. VAN EESTEREN. Scheme for a villa, 1923.

262. WALTER GROPIUS. The Bauhaus, 1926.

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Figure 2.15 Implying the syntax of planarity, Giedion constructs parallelism among cubist, neo-plastic art, suprematist architecture and *Neues Bauen* under the effect of the progressive development. From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), pp. 440-441.

Figure 2.16 A photograph by Carl Hubacher and typography by Sigfried Giedion's in his bookjacket design of *Befreites Wohnen; Licht, Luft, Oeffnung*, Sigfried Giedion, (1929). From *Sigfried Giedion; An Intellectual Biography*, Sokratis Georgiadis, (1993), p. 79.

In his book *The Theory of the Avant-Garde,* by placing the characteristic structure of avant-garde into a linear explanation system of four moments as activism, antagonism, nihilism, and agonism, Renato Poggioli divorces it completely into two poles.[224] On the other hand, the synthesizing manner of Giedion in the aim of reintegration of art and life renders Poggioli's duality of programmatic and destructionist as simultaneous, and turns *aporia* into *stasis*. In this manner, in addition to his avant-garde role, Giedion as well adopts the role of a "mediator."[225] With the effect of this dual role, Giedion not only unifies engineering with avant-garde architecture, but also proposes for the unification of avant-garde art with science.

Transforming the idea of Space shaped by 19th century German aesthetic theories to modern space under the effect of avant-garde tendencies in Europe during the first quarter of the 20th century, Giedion not only alters the object-subject relationship, but also structurally re-constructs the idea of space. In his book *Space, Time and Architecture* written in 1941, he terms the modern space conception dependent upon the cognitive status of spatial experience of the mobile beholder as Space-time.

In the Introduction part titled as "Architecture in the 1960's: Hopes and Fears" added to the Fifth edition of his book *Space, Time and Architecture* in 1967, he determines the characteristics of the Space-time already in the beginning of the book:

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[224] Renato Poggioli, *The Theory of the Avant-Garde* (Cambridge: Harvard Uni. Pr., 1968); Translated from *Teoria dell'arte d'avanguardia* (Bologna: Società Editrice Il Mulino, 1962), See the chapters "The Dialectics of Movements," "Activism" and "Antagonism" pp. 25-40; "Nihilism" and "Agonism," pp. 61-68.

[225] Fredric Jameson explains the concept of mediation via the "transcoding" concept:

"(...) the relationship between the levels or instances [of social practice], and the possibility of adapting analyses and findings from one level to another. Mediation is the classical dialectical term for the establishment of relationships between, say, the formal analysis of a work of art and its social ground, or between the internal dynamics of the political state and its economic base. ...The concept of mediation has traditionally been the way in which dialectical philosophy and Marxism itself have formulated their vocation to break out of the specialised compartments of the (bourgeois) disciplines and to make connections among the seemingly disparate phenomena of social life generally. If a more modern characterization of mediation is wanted, we will say that this operation is understood as **a process of *transcoding*: as the invention of a set of terms, the strategic, choice of a particular code or language, such that the same terminology can be used to analyze and articulate two quite distinct types of objects or 'texts,' or two very different structural levels of reality. Mediations are thus a device of the analyst, whereby the fragmentation and autonomization of social life... is at least locally overcome, on the occasion of a particular analysis**." Fredric Jameson, *The Political Unconscious* (Ithaca: Cornell Uni. Press, 1981), pp. 39-40. Quoted by K. Michael Hays, *Modernism and the Posthumanist Subject, The Architecture of Hannes Meyer and Ludwig Hilberseimer*, (Cambridge, Mass.: The M.I.T. Press, 1995), p. 19. Italic is original. Emphases are added.

"It has in common a space conception, which is as much a part of its emotional as of its spiritual attitude. It is not the independent unrelated form that is the goal of architecture today but the organization of forms in space: space conception. This has been true for all creative periods, including the present. **The present space-time conception — the way volumes are placed in space and relate to one another, the way interior space is separated from exterior space or is perforated by it to bring about an interpenetration** — is a universal attribute which is at the basis of all contemporary architecture."[226]

[226] Giedion, *S.T.A.*, p. xxxvii. Emphases are added.

CHAPTER 3

TIME

3.1 Formation of the *Space-time* Myth; The Fusion among the Time Conceptions of Higher-Reality, *n*-Dimensionality, Hyperspace Philosophy, Minkowski's *Space-Time Continuum* and Einstein's General Theory of Relativity

In 1930s, in order the render as acceptable the concept of Space-time he has begun to use for emphasizing the temporal attribute of modern space conception, Giedion has directly linked this temporality with Einstein's Theory of Relativity and the new spatial representation techniques of cubist pictures. As one who has been effective over Giedion in building up parallelism among his concept of Space-time and the idea of fourth dimension, Einstein's Theory of Relativity, Minkowski's theory of *Space-Time Continuum*, and the Cubist theories, Van Doesburg has, just as Malevich and Dorner, misinterpreted this theories and techniques. Owing to pseudo-kinship established by theories and terminologies in scientific fields like physics, astronomy, and astrophysics on the one hand and mathematics and painting on the other, many concepts are transferred to architecture via cross-fertilization and migration. On basis of expectations of the realm they have been implanted, their meanings have become ambiguous and ambivalent where the proliferations of meanings render more mentally associations possible. Giedion has utilized this state of ambiguity he has converted into some mechanisms of persuasion sometimes literally and other times evocatively in a way as to cover all the proliferated meanings that may conflict one another in a range from pseudo-scientific studies of the 19th century to discourses in science fiction literature, and beliefs in mystic and esoteric higher-reality, from the theories of non-Euclidean geometry in mathematics and Relativity theories in field of modern physics to non-representational Cubist paintings. Within Giedion's narrative, these proliferated meanings are quoted instrumentally in four channels: non-Euclidean geometry as an instrument for the possibility of a new geometry; *n*-dimension as an instrument for the possibility of Fourth Dimension, which has been adopted as a reception of geometrical representation of time; Einstein's Relativity Theories as an instrument for the possibility to construct the inseparable continuum between Space and Time; and, Simultaneity and

Transparency in non-representational cubist techniques as the instruments for the possibility to characterize the corporeality of "new space conception" as Transgression. In order to conceive of Giedion's construction of Space-time, its inheritance upon cross-fertilizations of the time conception in realms of art and science together with the conceptual transformation of meanings and justifications of the "new understandings" are required to be deconstructed. For this reason, except for Doesburg, Malevich, Dorner and Le Corbusier, whom Giedion has been under intellectual influence, the names and theories of influence shall as well be scrutinized.

Of the two geometries having an impact upon artists during the first two decades of the 20th century, while the principles of non-Euclidean theory were first formulated in 1820s, the *n*-dimensional geometry has begun to be discussed in 1840s. Linda Dalrymple Henderson, who profoundly elaborates reflections of the long-lasting relationship between non-Euclidean theory and *n*-dimensional geometry upon the realm of art, states in her book titled *The Fourth Dimension and Non-Euclidean Geometry in Modern Art*[229] that underpinning the public interest in non-Euclidean geometry and the geometries of higher dimension in question for realms of, first in mathematics and then, in literature after 1860, take place in two separate realms: the nature of geometrical axioms and the nature of our space.

The nature of geometrical axioms was concerned primarily with non-Euclidean geometry. "The examination of the nature of our space, however, encompassed two questions: (1) the possible curvature space, an issue related to non-Euclidean geometry and the problem of geometrical axioms; and (2) the number of dimensions of space, suggested by geometries of higher dimensions."[230]

In response to rise of popular interest in new geometries, the idea of Higher Reality, which has been believed since the Platon's concept of the world of ideals, has begun to be interpreted as to encounter the mystic, esoteric and pseudoscientific expectations of artists.

Due to the popular analogy made during this period, just as in hierarchical Plotinian universe model in which the two-dimensional world cannot be aware of the third

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[229] Linda Dalrymple Henderson, *The Fourth Dimension and Non-Euclidean Geometry in Modern Art*, (New Jersey: Princeton Uni. Press, 1983).

[230] Dalrymple Henderson, *ibid*, p. 10.

dimension, the problem in multi-dimensionality has been interpreted rather as the three-dimensioned world being unaware of the fourth dimension and even further. Owing to this widespread view, time has been imagined as the fourth dimension in *n*-dimensional hierarchical universe model. As stated by one of the members of the Cambridge Platonist circle in 17th century, namely by Henry More in his *Enchiridion Metaphysicum* in 1671, the first use of the term "fourth dimension" has been defined as where the Platonic ideal is realized, that is, the realm of higher reality.[231] Time as the fourth dimension has first been published as mentioned in the "dimension" item of *Encyclopédie* prepared by D'Alembert and Diderot in 1754. Statement of the fourth dimension as higher reality in the first popular fiction tale on the topic, namely in *Flatland*[232] by theologian and educator E. A. Abbott[233] published in 1884 on the one hand, and statement of time as the fourth dimension in the popular science-fiction titled as *The Time Machine* by Herbert G. Wells in 1895 on the other,[234] have both been influential in letting this vague understanding, which matches time with the fourth dimension that is over the three-dimensional world lived within, become widespread:

> "So that by 1900 the term [fourth dimension] had philosophical, mystical and pseudoscientific implications along with its alternative interpretation as time."[235]

> "Supposed by many to be part of the esoteric vocabulary of contemporary science and only that, the term [fourth dimension] is as well a

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[231] John Adkins Richardson, *Modern Art And Scientific Thought*, (Chicago: Illinois Uni. Press, 1971), p. 106 and Dalrymple Henderson, *ibid*, p. 18.

[232] "*Flatland* achieved instant success, with a second edition in 1884 and nine successive reprintings by 1915. Although the book was not translated into French, it was known in Paris, for E. Jouffret discusses the two-dimensional analogy and cites *Flatland* in his 1903 *Traité élémentaire de géométrie à quatre dimensions*, a book known Duchamp and certain of his Cubist friends." Dalrymple Henderson, *ibid*, p. 25.

[233] "Abbort's tale is based on the premise that the meaning of the third dimension for a two-dimensional being compares to the meaning of the fourth dimension for us." Dalrymple Henderson, *ibid*, p. 17.

[234] "Clearly …any real body must have extension in four directions: it must have Length, Breadth, Thickness, and—Duration. But through a natural infirmity of the flesh, which I will explain to you in a moment, we incline to overlook this fact. There are really four dimensions, three which we call the three planes of Space, and a fourth, Time." Herbert G. Wells, *The Time Machine; An Invention* (London: W. Heinemann, 1895), p. 3. Quoted by Dalrymple Henderson, *ibid*, p. 33.

[235] Dalrymple Henderson, *ibid*, p. 11.

household word among many nonscientific groups connected with very exotic varieties of speculation."[236]

As one of the thinkers of the late 19th century who has concentrated on "the nature of space" and "how to identify the effects of motion," Charles Howard Hinton has developed "Hyperspace Philosophy."[237] Hinton's objective has been to visualize fourth dimension by means of a four-dimensional hypercube he has designed and named as "tesseract"[238] and to offer this to public as a non-mathematical system. As influenced by the idea of *n*-dimensionality, the philosophy of hyperspace, which has been fostered by Hinton in 1880s, has then turned into a philosophy that popularized fourth dimension as the time.

The *n*-dimensional geometry, which constitutes another branch of mathematics, is mistakenly associated with the non-Euclidean theory. The main problem of *n*-dimensional geometry is concerned with how a new dimension in addition to the three dimensions will be visualized. A second problem is inherent to this problem; This problem that is conceived generally as inclusion of an additional dimension to three-dimensionality, deals with how the geometry of fourth dimension is to be formulated, in more frank words, how movement that is conceived as the fourth dimension will be added to three-dimensionality and transform it. The diagrams of hypercube generated

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[236] Richardson, *ibid*, p. 106.

[237] "Writers of hyperspace philosophy believe firmly in the reality of a fourth dimension of space, yet tend to oppose any form of positivism that requires empirical proof of its existence. Their underlying theme is generally that the answer to the evils of positivism and materialism is for man to develop his powers of intuition, in order to 'perceive' the fourth dimension of our world, the true reality. Hyperspace philosophy is an idealist position, and its proponents frequently refer to Plato's world of ideas or Kant's unknowable noumenon, the 'thing-in-itself.' Just as the more mystical bent of mind characteristic of hyperspace philosophy owes something to Zöllner's connection of the fourth dimension with spiritualism, hyperspace philosophy later takes on elements of the occult and at times unites with Theosophy." Dalrymple Henderson, *ibid*, p. 25.

[238] "Hinton conceived the tesseract by means of the sections that would be formed when it passed through three-dimensional space. Just as sphere passing through a plane produces a series of increasing and then decreasing circles, which would be experienced by a plane dweller as movement in time, Hinton's method produces a time oriented vision of a four-dimensional body. The coloured cubes already introduced are to be the 'sections' of the four-dimensional hypercube. We are to 'see' the sections of the tesseract as they pass through our space, and the patterns of changing colors are the means of recognizing the position of the tesseract and its component cubes at any moment. Hinton continually emphasized the crucial role of time in his system: 'all attempts to visualize a fourth dimension are futile. It must be connected with a time experience in three space [three-dimensional space].'" Dalrymple Henderson, *ibid*, p. 29.

first by Hinton and of hypersolid offered both as to visualize this problem, have become popular by the end of 19th century.[239]

On the other hand, non-Euclidean geometry is a field of mathematics emerged during the first quarter of the 19th century after which the "self-evidently true" framework within the frame of mind of Euclidean geometry, the geometry Euclid has constructed upon 10 axioms,[240] has been overcome. Although Karl Friedrich Gauss has stated in 1824 that, as a mathematical problem, Euclid's fifth postulate, that is, the "parallel postulate" can be overcome and that alternative geometries are possible, the first formulation concerning the system of non-Euclidean geometry has been separately formulated by his students Nikolai Ivanovich Lobachevsky and Janos Bolyai respectively in 1829 and 1832. As for Georg Friedrich Bernhard Riemann, he has

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[239] "Often the four-dimensional property will be analogues to its three-dimensional counterpart with one dimension added. Thus, rotation in four dimension s occurs about a plane instead of about a line. The most obvious example of the operation of the rule of analogy is in the case of four-dimensional 'hypersolids.' A 'hypercube' would be generated by the motion of a cube into a new fourth direction, a process analogues to the generation of a cube by a square moving perpendicularly to itself. Similarly, a hypersolid is bounded by three-dimensional solids, just as the three-dimensional solids we know are bounded by two dimensional planes. Such a complex figure must necessarily be viewed in sections either by passing it through our space so that new three-dimensional sections continually appear or by turning it on an axis and taking successive three-dimensional views of it." Dalrymple Henderson, *ibid*, pp. 7-8.

[240] "The concept of space as it developed from antiquity was founded on Euclidean mathematics, for which space, as a continuum with its own independent reality, was never fully posited. The elements of which this system was constructed—the point, the line, and the plane—were nothing more than idealizations of solid bodies. Space itself emerged only secondarily, that is, only insofar as it could be derived from these idealized forms and the relations produced by their contact—intersections, points lying on lines or planes, and so on. Only with Descartes does space finally emerge as autonomous and preexisting: an infinite and generalized three-dimensional continuum, where points and figures are describable by their coordinates.

If geometrical descriptions in the Euclidean system were reducible to actual objects (point, line, and plane) or aggregates and derivations thereof, the Cartesian system permitted 'all surfaces (to) appear, in principle on equal fooling, without any arbitrary preference for linear structures.' Space now existed, in other words, independent of solid bodies, preceding them and containing them.

Until the introduction of dynamics, the Greek system had been adequate for all geometric needs (e.g., Brunelleschi, Desargues, Mercator), but the new Cartesian system would be absolutely indispensable for Newtonian physics, in which equations of motion and acceleration play a dominant role. This is because acceleration cannot be expressed or defined as a relation between points alone but only in relation to an abstract ground of space as a whole. Events could now be conceived of as taking place against a fixed backdrop that also served as their unaffected carrier." Sanford Kwinter, *Architectures of Time; Toward a Theory of the Event in Modernist Culture* (Cambridge, Mass.: The M.I.T. Press, 2001), p. 58.

suggested another alternative to the Euclid system in 1854. In Riemann's geometry based on the distinction between "unbounded" and "infinite"[241] spaces:

> "Riemann saw geometry as the study of manifolds of any number of dimensions and of any curvature, using differential geometry as the measure of this curvature.
>
> (…) On the surface of a sphere space would be unbounded and yet finite, and the sphere, in fact, is the most easily understood model for the non-Euclidean geometry implied by Riemann. Once space is finite and a line cannot be extended indefinitely (as Euclid's parallel postulate assumes it will be), it is possible to establish that *no* line can be drawn parallel to given line. This principle is readily apparent in the geometry of the sphere where 'lines' are defined as great circles and will all intersect at the 'poles' of the sphere. From the analogy with spherical geometry, it is also clear that sum of the angles of a triangle will be greater than 180˚."[242]

> "…all lines, Riemann argued, may be finite in length but endless, like circles. This assumption suggested that he could also assert a parallel postulate to the effect that there are no such things as parallel lines. From this point he went on to construct a geometry having theorems such as: all the perpendiculars to a straight line meet in a point; two straight lines always enclose an area; and similar triangles are also congruent."[243]

In Riemann's theory based on the "possibility of curvature system," the figures that move on such an irregularly shaped surface has to change their own shape and properties (Figure 3.1). In his works, Marcel Duchamp endeavors to display on two-dimensional picture surface how the images and figures are deformed by such a projection system and the "fourth dimension" he receives as an unseen, hidden and unknowable dimension.[244] Dalrymple Henderson, on the other hand, sets forth the idea that existence of "the possibility of curved space" has been influential upon invalidation of the linear perspective system, which has been effective since the Renaissance.

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[241] Dalrymple Henderson's distinction has been changed by Richardson as "infinitude" and "endlessness." Richardson, *ibid*, p. 53.

[242] Dalrymple Henderson, *ibid*, p. 5. Italic is original.

[243] Richardson, *ibid*, p. 53.

[244] Marcel Duchamp, expresses that his work *The Bride Stripped Bare by Her Bachelors, Even* (*The Large Glass*) is based on the idea of fourth dimension: "I have only dreamed of an idea of unseen fourth dimension as a projection because of invisibility." Jean Clair, *Marcel Duchamp ou le Grand*

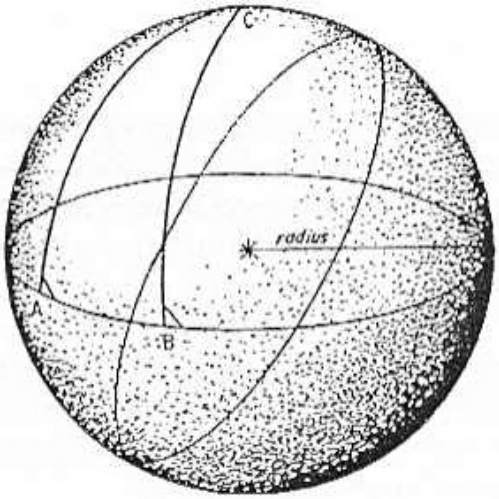

Figure 3.1 Riemann's non-Euclidean geometrical surface. From *Modern Art And Scientific Thought*, John Adkins Richardson, (1971), p. 53.

In his book titled as *Analysis of the Sensations* written in 1886, Ernst Mach elaborates the idea of space by separating it as geometrical and perceptual space — which he himself calls as physiological space — with the claim that there can be more than one space that he further analyzes this topic in *Space and Geometry*, written in 1906. As for in France, the writings of Henri Poincaré on "the nature of geometrical axioms" caused Euclidian geometry become popular. In his work *La Science et l'hypothèse* written in 1895, he depicts the difference between geometrical and perceptual spaces as follows:

> "'1. It is continuous; 2. It is infinite; 3. It has three dimensions; 4. It is homogeneous, that is to say, all points are identical one with another; 5. It is isotropic, that is to say, all the straights which pass through the same point are identical one with another.' In contrast, perceptual space is made up of three component spaces, visual, tactile, and motor, which are neither continuous, infinite, homogeneous, nor isotropic. Of perceptual space, 'one cannot even say that it has three dimensions.' "[245]

Fictif; Essai de Mythanalyse du Grand Verre, (Paris: Editions Galilée, 1975), translated by Özge Açıkkol in Turkish as *Marcel Duchamp ya da Büyük Kurgu; Büyük Cam'ın Söylensel Çözümlemesi Üzerine Bir Deneme*, Jean Clair; (Istanbul: Yapı Kredi Yay., 2000), p. 25. Freely translated by author.

[245] Henri Poincaré, *La Science et l'hypothèse* (Paris: Ernest Flammarion, 1902), pp. 69, 74. Quoted by Dalrymple Henderson, *ibid*, p. 36.

Focused on "the process of spatial perception," Poincaré accordingly developes his view on the fourth dimension via perceptual space and personal experience:

> "According Poincaré, our notions of visual, tactile, and motor space are generated through associations among sensations, which are developed through personal experience and heredity. Because these associations have become customary, it is difficult, though possible, to break them apart. If, for instance, the two muscular sensations of accommodation and convergence of the eye, which normally function together in one series, were to vary independently of one another, the 'complete visual space' to which they give rise would have four instead of three dimensions. Pursuing this line of thought, Poincaré makes a statement that must have intrigued the Cubists and their generation: 'From this point of view, *motor space would have as many dimensions as we have muscles*.'"[246]

Throughout the process during which these mathematical theories have been combined with the fourth dimension and become popularized such that the Cubist theory has also been influenced, the science fiction literature has played a profound role. A French admirer of Herbert G. Wells, writer of the novel *Voyage au pays de la quatrième dimension*, and editor of *Comoedia*, Gaston de Pawlowski had serialized its novel during 1910 and "24 December 1909 discussions of the fourth dimension were appearing on the front page of *Comoedia*"[247] (Figure 3.2). As the fourth dimension was regarded as a true and complete reality for Pawlowski, despite the fact that mathematical and geometric representation was rather not much of his concern, "he tends to identify the geometry of *n*-dimension with non-Euclidean geometry: he discusses the non-Euclideans, Lobachevsky, Riemann, Helmholtz, and Beltrami, as though their work had been related to the existence of a fourth dimenson."[248]

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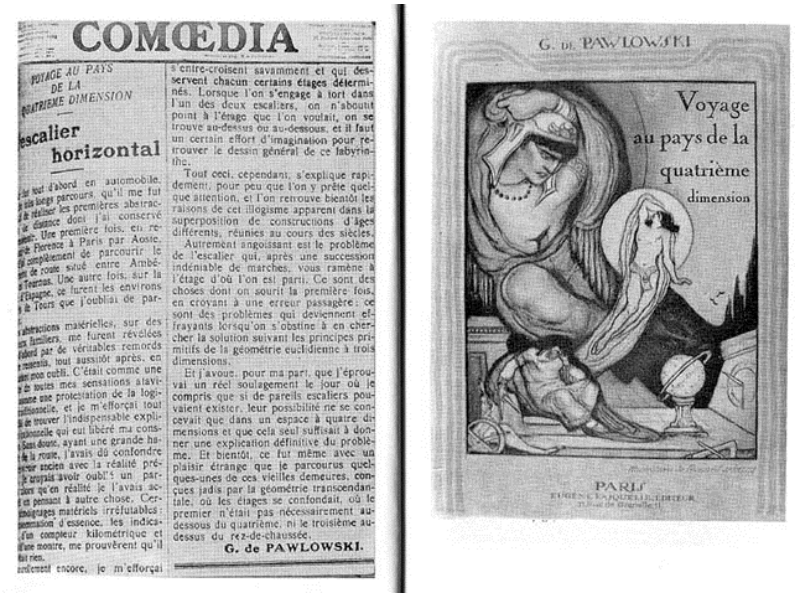
[246] Poincaré, *ibid*, p. 73. Quoted by Dalrymple Henderson, *ibid*, p. 37. Italics are original.

[247] Dalrymple Henderson, *ibid*, p. 52. "Pawlowski, like Wells, found the notion of the fourth dimension a valuable tool for social criticism. However, while a voyage through time is involved in Pawlowski's story, he does not treat time as the fourth dimension. Instead, the fourth dimension is associated with the extra dimension of space that had fascinated the nineteenth century. It is the ability to see and understand this fourth dimension of space which characterizes a future era of idealism in the 'country of the fourth dimension,' and the absence of this insight which underlies the evils of contemporary materialist society and positivist science. Pawlowski's work is thus a unique blend of Wells's science fiction as social commentary and hyperspace philosophy in the tradition of Hinton.

Pawlowski later described his purpose in writing *Voyage* in the introduction to the 1923 edition: '... A passionate belief in the unique and total creative power of the Idea, this book was originally an attempt to escape from bourgeois certainty, a rebel protest against the scientific tyranny of the moment.'" Dalrymple Henderson, *ibid*, p. 51.

[248] Dalrymple Henderson, *ibid*, p. 54.


COMŒDIA

VOYAGE AU PAYS DE LA QUATRIEME DIMENSION

escalier horizontal

G. de PAWLOWSKI

G. DE PAWLOWSKI

Voyage au pays de la quatrième dimension

PARIS

Figure 3.2 Popularizing the idea of Fourth Dimension in French science fiction literature by Gaston de Pawlowski's *Voyage au pays de la quatrième dimension* and its feuilleton in *Comœdia Journal*. Gaston de Pawlowski's "Voyage au pays de la Quatrième Dimension" on 29 March 1912 *Comœdia Journal* (left) and Léonard Sarluis' illustrations on the front cover of 1923 edition of *Voyage au pays de la Quatrième Dimension*, (Paris: Eugène Pasquelle Èditeur, 1923). From *Marcel Duchamp ya da Büyük Kurgu*, Jean Clair, (2000), pp. 42-43.

Dalrymple Henderson thinks that, owing to their writings on "social critical" and pseudoscientific fourth dimension, Pawlowski and the Cubists have been mutually influential upon one another:

> "Pawlowski's attitude toward Cubism in particular can be ascertained from three of his articles: his review in January 1913 of Gleizes and Metzinger's *Du Cubisme*; the 30 March 1913 installment of his series 'Aristote à Paris,' entitled 'Le Miroir cubiste'; and his September 1913 review of Apollinaire's *Les Peintres Cubistes.*
>
> Once Pawlowski had read *Du Cubisme*, he could at least appreciate Cubist theory, if not Cubist painting itself."[249]

> "Considering [Alfred] Jarry's connections with Apollinaire and with artistic circles in Paris, and the presence of Pawlowski's serial on the front page of *Comoedia* during 1910 and 1912, science fiction involving the fourth dimension was the most direct channel of popular literature by which the Cubists could have come into contact with the fourth dimension and

[249] Dalrymple Henderson, *ibid*, p. 47.

non-Euclidean geometry. In fact, some contact of this sort could hardly have been avoided."[250]

3.2 "Space-Time" Myth as a Conveyor of the *n*-Dimensionality into Painting

Under the effect of mathematical theories and scientific discoveries, such fields of art as Futurism and Cubism that have emerged in the first two decades of the 20th century during which "the essence of reality" was extremely questioned, have visualized "the reality" in context of fourth dimension and non-Euclidean geometry and have problemized it in philosophical terms both.

The relationship between Cubism and the fourth dimension owes its establishment to a lecture on fourth dimension and modern painting given at *Exposition d'Art Contemporain* by the poet Guillaume Apollinaire on the 25th of November, 1911.[251] Concerning the reception of "artistic fourth dimension" in France, Apollinaire has been influential by his article "La Peinture nouvelle" in *Les Soirée de Paris* of April 1912 and Chapter 3 of his book *Le Peintures Cubistes* of early 1913.[252] As with efforts of

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[250] Dalrymple Henderson, *ibid*, p. 47.

[251] Dalrymple Henderson, *ibid*, p. 67.

[252] "The new artists have been violently attacked for their occupation with geometry. Yet geometrical figures are the essence of drawing. **Geometry, the science of space**, its dimensions and relations, has always determined the norms and rules of painting.

Until now, the three dimensions of Euclid's geometry were sufficient to the restiveness felt by great artists yearning for the infinite.

The new painters do not propose, any more than did their predecessors, to be geometers. But it may be said that geometry is to the plastic arts what grammar is to the art of the writer. Today, scientists no longer limit themselves to the three dimensions of Euclid. 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 **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**. It gives objects its right proportions on the whole, whereas in Greek art, for instance, a somewhat mechanical rhythm constantly destroys the proportions.

Greek art had a purely human conception of beauty. It took man as the measure of perfection. The art of the new painters takes the **infinite universe as its ideal**, and it is to **this ideal that we owe a new norm of the perfect**, which permits the painter to proportion objects in accordance with **the degree of plasticity** he desires them to have.

(...) Finally, I must point out that the **fourth dimension —this Utopian expression** should be analyzed and explained, so that nothing more than historical interest may be attached to it— has come to stand for the aspirations and premonitions of the many young artists who contemplate Egyptian,

Apollinaire, the fact that the fourth dimension associated with "the new norm of the perfect" has become the "infinite universe," has constituted the idealism of Cubist theory. By this way, the ideal has then become "no single absolute truth, but a higher reality or transcendental truth that was to be discovered indivudually by each artist." Thus, this search of ideal was itself regarded as freedom. On the other hand, in their publication dated to 27th of December, 1912, Albert Gleizes and Jean Metzinger have opened a new channel for deformation by suggesting "the space of Cubism" they claimed to attribute to "the non-Euclidean scholars" and "Riemann's theorems," to entirely be torn away from the "natural space":

> "The worth of a river, foliage, and banks, despite a conscientious faithfulness to scale, is no longer measured by width, thickness, and height, nor the relations between these dimensions. Torn from natural space, they have entered a different kind of space, which does not assimilate the proportion observed."[253]

Gleizes and Metzinger have referred to the fourth dimension as a phenomenon that provided a rationale for the two major Cubist methods for portraying form and space: the artist's liberty to form or deform an object and his rejection of perspective; that justified the rejection of three-dimensional Renaissance perspective; and, that was an alternative to perspective.[254] The state of being "torn from natural space" has

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negro, and oceanic sculptures, meditate on various scientific works, and live in anticipation of a sublime art." Guillaume Apollinaire, *Les Peintures Cubists*, 1913, pp.15-17, trans. by Lionel Abel, *The Cubist Painters; Aesthetic Mediations 1913*, (rev. ed. New York: George Wittenborn, 1962 [1944]), pp. 13-14. Italic is original. Emphases are added.

[253] Albert Gleizes and Jean Metzinger, *Du Cubisme*, (Paris: Eugène Figuière, 1912), pp. 15-16, trans. by Robert L. Herbert, ed., *Modern Artists on Art* (N.J.: Prentice-Hall, 1964), p. 8. Quoted by Dalrymple Henderson, *ibid*, p. 79.

[254] "As far as *visual* space is concerned, we know, as the Cubists say, that it results from the sensation of accommodation and the convergence of lines in space.

For the picture, a flat surface, the accommodation is negative. The convergence of straight lines that perspective forces us to postulate cannot evoke the idea of depth. Moreover, we know that the most serious infraction of perspective does not compromise in any way the spatiality of a painting. Chinese painters evoke space in spite of the fact that they are strongly convinced of the idea of the divergence of lines.

To establish pictorial space, we must have recourse to the sensation of movement and of touch and to all our faculties. It is our whole personality which, contracting and expanding, modifies the picture. The basic forms appear with a dynamism that we must overcome.

The American scholar Hinton, whose thoughts on the fourth dimension are so full of significance and surprisingly coincide with the most extreme ideas of the innovators of painting, speaks as follows:

It is important to develop the space sense, for it is the means by which we think about real things.

The space sense or the intuition of space, is the most fundamental power of the mind. But I do not find anywhere a systematic and thoroughgoing education of the space sense.

corresponded to the rejection of perspective in Cubist painting where deformation was linked to the question of proportion, and the technique they perceived as multiple viewpoints has been breaking the figure up into facets:

> "In Metzinger's *Nude* of 1910, for instance, the multiple facets help to destroy any clear-cut sense of the figure's three-dimensional existence by merging figure and space. At the same time, the facets suggest the greater complexity of a higher-dimensional body. As Apollinaire explained later, '…The geometrical surfaces of an object must be opened out in order to give a complete representation of it.'"[255]

Deemed as the forerunner of Cubism, Cézanne's attitude, which has been effective in breaking up the perspectival views of Cubist theory, in breaking up the perspective views of "…see not with a single, unmoving eye (as perspective requires), but with two active eyes set within a head that also shifts."[256] Gleizes and Metzinger, who have closely followed the essays of Poincaré thought that the tactile and motor sensations of Poincaré shall be combined with the channel opened in field of painting by Cézanne to then reject the perspective system of Cubist theory:

We usually see objects as either above or below us, or on the same level with us, to the right or to the left, behind us or in front of us, and always from one side only—the one facing us—and in perspective. Our eye is an extremely imperfect instrument; it gives us an utterly incorrect picture of the world. What we call perspective is in reality a distortion of visible objects which is produced by a badly constructed optical instrument—the eye. We see all objects distorted. And we visualize them in the same way. But we visualize them in this way entirely owing to the habit of seeing them distorted, that is, owing to the habit created by our defective vision, which has weakened the capacity of visualization. But, according to Hinton, there is no necessity to *visualize* objects of the external world in a distorted form. The power of visualization is not limited by the power of vision. We see objects distorted, but we know them as they are. And we can free ourselves from the habit of visualizing objects as we see them, and we can learn to visualize them as we know they really are. Hinton's idea is precisely that before thinking of developing the capacity of seeing in the fourth dimension, we must lean to *visualize* objects as they *would be seen from the fourth dimension*, i.e., first of all, not in perspective, but from all sides at once, as they are known to our consciousness. It is just this power that should be developed by Hinton's exercises. The development of this power to visualize objects from all sides at once will be the casting out of the self-elements in mental images.

According to Hinton, casting out the self-elements in mental images must lead to casting out the self-elements in perceptions. In this way, the development of the power of visualizing objects from all sides will be the first step toward the development of the power of seeing objects as they are in geometrical sense, i.e., the development of what Hinton calls a *higher consciousness*." Cited from Metzinger and Gleizes's *Du Cubisme* translated by Dalrymple Henderson, *ibid*, Appendix C, pp. 368-369. Italics are original.

[255] Dalrymple Henderson, *ibid*, p. 79; Guillaume Apollinaire, "Die moderne Malerei," *Der Sturm* (Berlin), nos. 148-149 (Feb. 1913); trans. in *Cubism*, Edward F. Fry, ed., (N.Y.: McGraw-Hill, 1966), p. 113.

[256] Dalrymple Henderson, *ibid*, p. 81.

> "What the new school claims to have discovered, what it hopes to apply is 'mobility in space,' to define our foremost principle in most succinct form. Art to this day has represented only the immobile, given only one aspect of form, **as if substance had only one aspect, or the human eye were able to grasp only one, and were itself a fixed, immovable organ.** The new school seeks to achieve a greater reality by portraying **things in their entirety**, that is, by giving them on the same canvas, as many of the aspects under which they may be seen, as the artist may choose to give."[257]

As stated in Edward Fry's book *Cubism*, the "move[s] around an object to seize from its several successive appearances,"[258] as mentioned in Gleizes and Metzinger's *Du Cubisme* published in 1912 were to stand for new circumstances since neither Braque nor Picasso used models for their paintings starting with the end of 1911:[259] besides articulation of surfaces through dematerialization of figure, the image of the object were to gain its form as the artist turned the object in his mind just as a geometer would.[260]

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[257] Jean Metzinger, as quoted in Yvonne Lemaître, "An Interview with Jean Metzinger on the Cubists and What They Are Doing in the World of Art," *Lowell* (Mass.) *Courier Citizen*, May 1913, Clipping preserved in scrapbook in Mabel Dodge Luhan Archive, Yale University, quoted Quoted by Dalrymple Henderson, *ibid*, p. 83. Emphases are added.

[258] Gleizes and Metzinger, *Du Cubisme*, p. 36, in *M. A. on A.*, p. 15, Quoted by Dalrymple Henderson, *ibid*, p. 84.

[259] According to Fry, the representation of movement about a model becomes meaningless for Picasso and Braque after 1911; "'Analytical' cubism reached its zenith in a dozen or more paintings of a single figure by Picasso and Braque, during 1911 and early 1912. Typical of these great paintings is Picasso's *Man with Violin* of late 1911. The subject is identifiable through realistic clues provided by the artist—an ear, his goatee, buttons on his coat, and the strings and sound holes of a violin. **It has proved tempting with such works to speak of the dissection or analysis of masses, and of the combination of multiple points of view, with implications of a 'Fourth Dimension' or of non-Euclidean geometry;** many critics have offered such explanations of these works. It is important to remember, however, that **by the end of 1911 neither Picasso nor Braque was any longer painting directly from nature**. One may legitimately speak of the combination of separate viewpoints in *Les Demoiselles d'Avignon*, Picasso's figure paintings done at Horta, and other examples of pre-1910, Cézannian cubism. But by 1911 cubism was as much an autonomous, internally consistent style with a new formal vocabulary of its own, as it was a means for describing the immediately visible world. The unresolvable tension between these two functions in 'analytical' cubism is the source both of its greatness as an art and of its misinterpretation by critics." Fry, *ibid*, p. 24. Emphases are added.

[260] "Such a technique was actually described by Poincaré in *La Science et l'hypothèse*. In that work, specific instructions are given by Poincaré for representing a four-dimensional object:

'. . . Just as the perspective of a three-dimensional figure can be made on a plane, we can make that of a four-dimensional figure on a picture of three (or of two) dimensions. To a geometer this is only child's play.

We can even take of the same figure several perspectives from several different points of view.

We can easily represent to ourselves these perspectives, since they are of only three dimensions.

Imagine that the **various perspectives of the same object succeed one another, and that the transition from one to the other is accompanied by muscular sensations**.

According to Dalrymple Henderson, "'fourth dimension' was an outgrowth of nineteenth-century *n*-dimensional geometry, a fact that provides a valuable insight into the time element in Cubist painting ('space-time') and the resultant juxtaposition of images ('simultaneity')."[261] In this manner, despite the fact that Simultaneity in Cubist Theory corresponded to the mentally captured and juxtaposed multiple viewpoints of object after 1912, reception of time was regarded not as the fourth dimension as time itself, but instead of the temporal means that enabled the artist to gather and synthesize information about the fourth dimension of space. Understanding of time in Cubist Theory, then has begun to reign upon *la durée*, which, in words of Bergson as described in his work *L'Evolution Créatrice* written in 1907, is as the phenomenon of duration that leads to a conceptual image in experiencing our environment;

> "Metzinger had published [November 1910] his 'Note sur la peinture,' commencing a series of statements by himself and Gleizes in which the role of time in Cubism was to be associated with the artist's free movement about his subject. After his talk of Picasso's 'free, mobile perspective,' Metzinger goes on to discuss Braque and states, 'Whether it be a face or a fruit he is painting, the total image radiates in time (*la durée*), the picture is no longer a dead portion of space.' Metzinger made the association of movement and time more explicit in his article, 'Cubisme et tradition,' published in *Paris-Journal* on 16 August 1911. In the first full statement of this notion, Metzinger explains the method of the new artists: 'They have allowed themselves to move round the object, in order to give, under the control of intelligence, a concrete representation of it, made up of several successive aspects. Formerly a picture took possession of space, now it reigns also in time (*la durée*).'"[262]

> "Haunted by the desire to register the **total image** he will give a considerable **dynamism** to the plastic work by making **the artist evolve around the object** to be represented; then with a tact, which will be the

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We shall of course consider **two of these transitions as two operations of the same nature when they are associated with the same muscular sensations**.

Nothing then prevents us from imagining that these operations combine according to any law we choose, for example, so as to form a group with the same structure as that of the movements of a rigid solid of four dimensions.

Here there is nothing unpicturable, and yet these sensations are precisely those, which **would be felt by a being possessed of a two-dimensional retina who could move in space of four dimensions**. In this sense we may say **the fourth dimension is imaginable**.'" Poincaré, *ibid*, pp. 89-90. Quoted by Dalrymple Henderson, *ibid*, pp. 84-85. Emphases are added.

[261] Dalrymple Henderson, *ibid*, pp. 89-90.

[262] Jean Metzinger, "Note sur la peinture," *Pan*, (Oct.-Nov. 1910), p. 650; Jean Metzinger, "Cubisme et tradition," *Paris-Journal*, (16 August 1911), p. 5, trans. in *Cubism*, Fry, pp. 66-67. Quoted by Dalrymple Henderson, *ibid*, p. 90.

> standard and the order of the painting, he sets down on it the greatest number of planes possible: to purely objective truth he wishes **to add a new truth, born from what his intelligence** will have allowed him to know. As he himself says, to **space** he will add **time** (*la durée*)."[263]

In Fry's analyses of Cubism, Bergson's *la durée* has been formulated as follows:

> "With the passage of time an observer accumulates in his memory a store of perceptual information about a given object in the external visible world, and this accumulated experience becomes the basis for the observer's conceptual knowledge of that object."[264]

However, Bergson would then tell that he has not understood anything from the relationship between Merzinger's concept of *durée* and the Cubist theory, denying to have ever seen a Cubist painting or to have knowledge of movement in general.[265] The basis of Metzinger's conceptualization depends more upon the new condition between the subject-object relationship, rather than on time. As also indicated by Dalrymple Henderson:

> "As in *n*-dimensional geometry, time in Cubist painting plays only a supporting role, allowing the artist or geometer to accomplish the physical or mental movement necessary to form an idea of an object's total dimensionality."[266]

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[263] Albert Gleizes, "Jean Metzinger," *Revue Indépendante*, no. 46, (Sept. 1911), pp. 165-166. Quoted by Dalrymple Henderson, *ibid*, p. 90. Emphases are added.

[264] Fry, *ibid*, p. 38.

[265] "This article [Jean Metzinger's *Cubism and Tradition*] played an interesting role in the history of cubism. At the end of 1911 Alexandre Mercereau was only one of the first among many defenders of cubism to declare that Henri Bergson had given his approval to cubism[†]. Andre Salmon, in announcing the exhibition of the *'Section d'Or'*, intimated that Bergson would write the preface to the catalogue, which Bergson in fact did not do. Bergson would have been a powerful ally indeed, for by 1911 he had become a national sage in the eyes of his fellow Frenchmen. But if one examines the source of these rumours, an interview with Bergson published in *L'lntransigeant,* one finds that Bergson admits never to have seen the works of the cubists; on being shown a copy of this article by Metzinger, Bergson replied that he did not understand a single word of it!* Yet the legend persisted for years that Bergson approved of the cubists, even after a second interview, in 1913, in which he denied either knowledge or approbation of cubism[§]." [†] *Vers et Prose*, no. 27, (Oct.-Nov.-Dec. 1913), p. 139. * André Salmon, *Paris-Journal*, (30 Nov. 1911), [§] *L'éclair*, (29 June 1913). Fry, *ibid*, p. 67.

[266] Dalrymple Henderson, *ibid*, p. 91.

Contrarily to Cubist Theory concerning the formation process of the *Total Image*, in Futurism, in spite of a fixed status in the conceptual position of the beholder, the expression of movement belongs to the object itself, just like a movie on screen.[267] The transformation process of subject-object relationship, which has attained a mental character owing to Poincaré, additionally gains characteristics of movement under the effect of Futurist reception. As perspective was thought to distort reality due to offering merely a partial vision,[268] the fragmented and multipoint view of vision proposed to replace perspective has caused subjective reality due to it's mentally and temporally (*la durée*) constructed structure.

During the first quarter of the century, even though fragmentation and faceting, both influential in art, seemed to oppose the desire to create total image, considering the dialectical structure in between, Robin Evans states: "It is a question of emphasis. If the stress is placed on totality of the simultaneously presented image, cubism aims for wholeness; if the stress is placed on the dislocation of parts that inevitably entails, then cubism ends up as fragmentation" and continues: "We have seen that the portrayal of an object in its totality requires the deconstruction of its picture's unity; conversely, the destruction of a picture's unity may, by inference, magic, or shared intuition, create the sense of a probable totality beyond the picture, and this is what the cubists believed they could accomplish with their kaleidoscopic composition."[269]

The temporal attribute of mentally constructed total image was generally understood as simultaneity in art. As for the first use of the simultaneity concept in painting, it was mentioned in preface of an exhibition catalogue of Futurists in 1912 as follows:

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[267] "The futurist painters provide a convenient example. Many of them have tried, in their pictures, to render the real movement of various objects; however, the perception of a real movement presupposes that we know some fixed point in space which will serve as a point of reference for all other movements. But this point does not exist. The movement which the futurists have perceived is therefore only relative to our senses and is in no way absolute. Here, then, is one error of reasoning due to our senses.

Painting based solely on external perception is, therefore clearly inadequate. If art is required to be not merely a means of nattering the mind and senses but more the means of augmenting knowledge, its function will only be served by painting forms as they are conceived in the mind; the primitives understood this very well." Maurice Raynal, "Conception and Vision," *Gil Blas* (29 August 1912), trans. in *Cubism*, Fry, p. 95.

[268] "Modern painting began as violent campaign against perspective. Perspective was inadequate because it was partial vision; because it recorded appearance as distinct from reality; because it was not even the way we see but a mere convention. Perspective was distortion." Robin Evans, *The Projective Cast; Architecture and Its Three Geometries*; (Cambridge, Mass.: The M.I.T. Press, 1995), p. 60.

"'simultaneity of states of mind' as a product of the speed and complexity of modern life."[270] The concept of time on the other hand, has never undertaken a major role in Cubist painting; "motion in time" was rather used to imply higher dimensions.

Outside France, Kasimir Malevich and El Lissitzky in Russia and Theo van Doesburg in Netherlands can be mentioned as the protagonist who would reflect the relationship between the fourth dimension and time upon architectural artifacts.

In his paintings as *Lumberjack*, having been started in 1912 under the effect of Italian Futurism, and *The Knife Grinder*, finished in 1913, Malevich has begun to transform naturalistic forms of representation into abstract forms where space and time were taken apart in the picture[271] (Figures 3.3 and 3.4). With the help of the force entailed by the translation of *Du Cubisme* into Russian in 1913, Kasimir Malevich has gained interest in faceting of forms within French Analytic Cubism.[272]

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[269] Evans, *ibid*, pp. 56, 62-63.

[270] Dalrymple Henderson, *ibid*, p. 91.

[271] "Figure and ground, in other words the lumberjack and the pieces of timber, are treated alike by the painter. Foreground and background are no longer separated formally and in coloring, but are unified. Representation of perspective is abandoned. Malevich is not interested in reproducing objects but in a new approach to the representation of the entire pictorial space. Time is still bound to space. The lumberjack looks suspended as if in a frozen pose." Jeannot Simmen, Kolja Kohlhoff, *Kasimir Malevich; Life and Work*, (Cologne: Könemann Verlag; 1999), p. 28. Caption of the painting *Lumberjack* of 1912-1913.

"This picture [*Knife-grinder, Principle of flickering*] shows not a moment in time, but the constant rotation of wheel and the movements of the operator. The background is likewise set in motion, so that the whole picture does not have a single static anchor point. By abondoning the pictorial ground as a point of rest, Malevich set himself apart from Futurism, which still retained it and showed (for example) a moving vehicle in front of a static background. The title itself, *Principle of flickering*, refers to Malevich's abandonment of the physical object. The representation of the operator and his work is shown dynamically, like a jerk film being projected. About this time the physical theory of waves was developed, which no longer interpreted the world as static." Simmen and Kohlhoff, *ibid*, p. 29. Caption of the painting *Knife-grinder. Principle of flickering* of 1913.

[272] Having begun to move from "Analytical" to "Synthetic" Cubism in 1912, Braque has abandoned to use naturalistic model after had invented *papier collés* as the first Cubist collage technique of the base of Synthetic Cubism. Richardson separates the differences between "Analytic" and "Synthetic" Cubism as follows: "Around 1912 Cubist painting began to tend towards the elimination of modeling, and shortly thereafter the collage made its appearance *Collage* means "glued matter" and was an appropriate name for works in which materials other than paint were applied to the surface of the canvas. The goal of the collage artist was the attainment of maximum concreteness and the notion of painting as handicraft was, perhaps, realized most completely in the *papier collés* of the Cubists. Prefabricated pattern matter was used, but if it was something like a newspaper it could not be read except as a formal clement of the composition because it was inverted, turned on its side, or smeared with pigment. And there was still the ambiguous space of earlier work. In *Guitar and Clarinet* by Braque we can't quite settle upon the true relationship of the paper to the cardboard. Are the forms cut from the paper or are they the result of the cardboard overlaying it? Or is one created in one way, and another in the other? The work is clearly Cubist, but as Picasso and Braque began to give to collage

Figure 3.3 Abandoning the perspective by the oscillating relation between figure/ground and foreground/background in Kasimir Malevich's painting *Lumberjack* of 1912-1913. Oil on Canvas, 94x71,5 cm, Amsterdam, Stedelijk Museum. From *Kasimir Malevich, Life and Work*, Jeannot Simmen, Kolja Kohlhoff, (1999), p. 28.

elements a new concreteness they also began to lend them the function of reconstituting the picture plane that early Cubism had destroyed.

By 1918 the process of de-spatializing things by breaking them up into lines and marks had reversed itself. Out of the strokes the solid zone was reinstated. This period in the work of Picasso, Braque, Gris, and Leger is often called 'synthetic' Cubism (after Apollinaire, who also invented the term 'analytic' Cubism for the earlier style). The paintings were still characterized by great artifice and ambiguity and were still conceived of as the composite results of the operations of the artist. Gris, in his letters, described the process as a matter of beginning with an abstraction and seeing something into it, the objects coming into being only by virtue of the abstract forms that existed beforehand in the mind of the painter." Richardson, *ibid*, pp. 117-119. Italics are original. For further detailed information about the invention of the Collage technique, see also, Christine Poggi, *In Defiance of Painting: Cubism, Futurism, and the Invention of Collage*, (New Haven: Yale Uni. Pr., 1992).

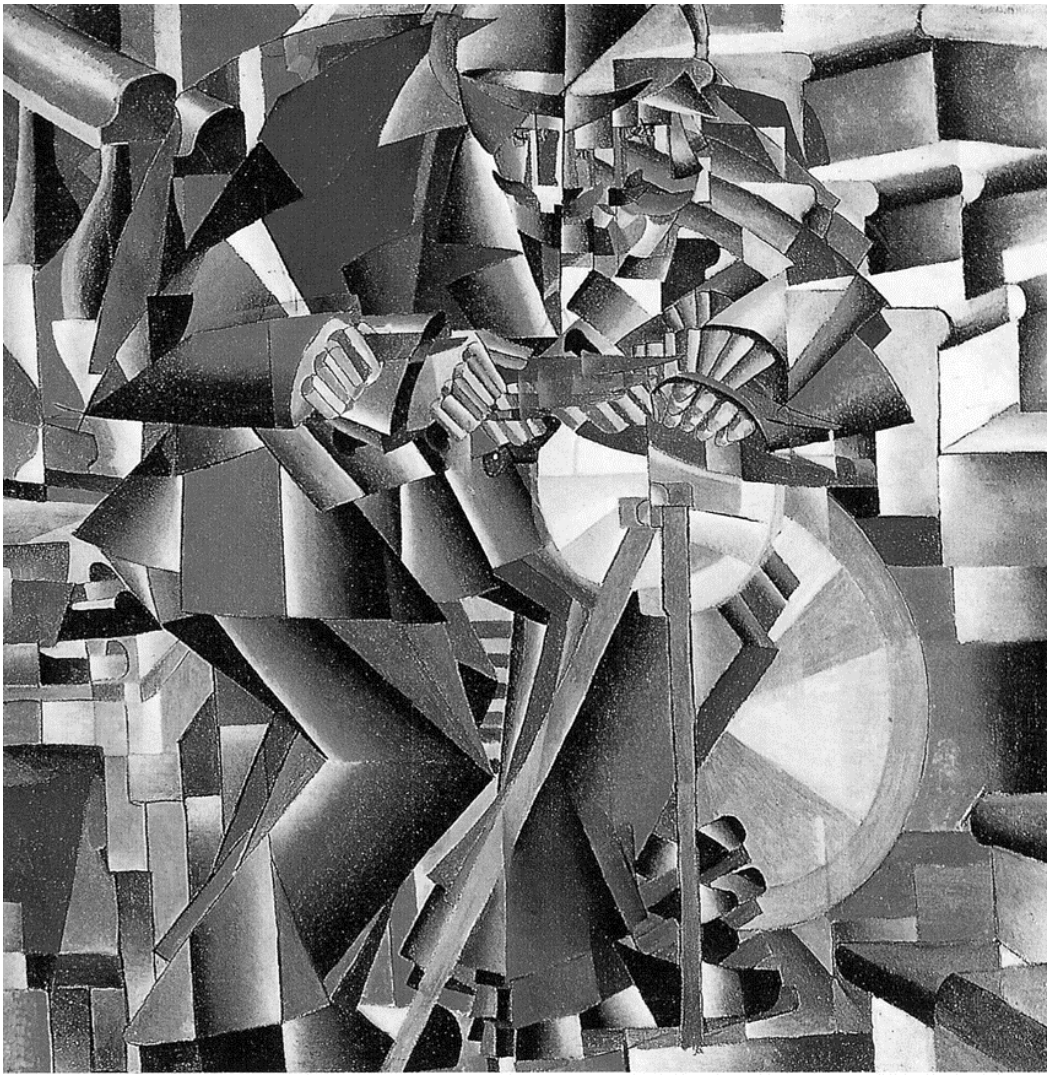

Figure 3.4 Abandoning the physical object by constantly rotating wheel on the foreground, Malevich creates tension between the static background and dynamic foreground in *Knife-grinder. Principle of flickering* of 1913. Oil on Canvas, 79,5x79,5 cm, New Haven, Yale University Art Gallery. From *Kasimir Malevich, Life and Work*, Jeannot Simmen, Kolja Kohlhoff, (1999), p. 29.

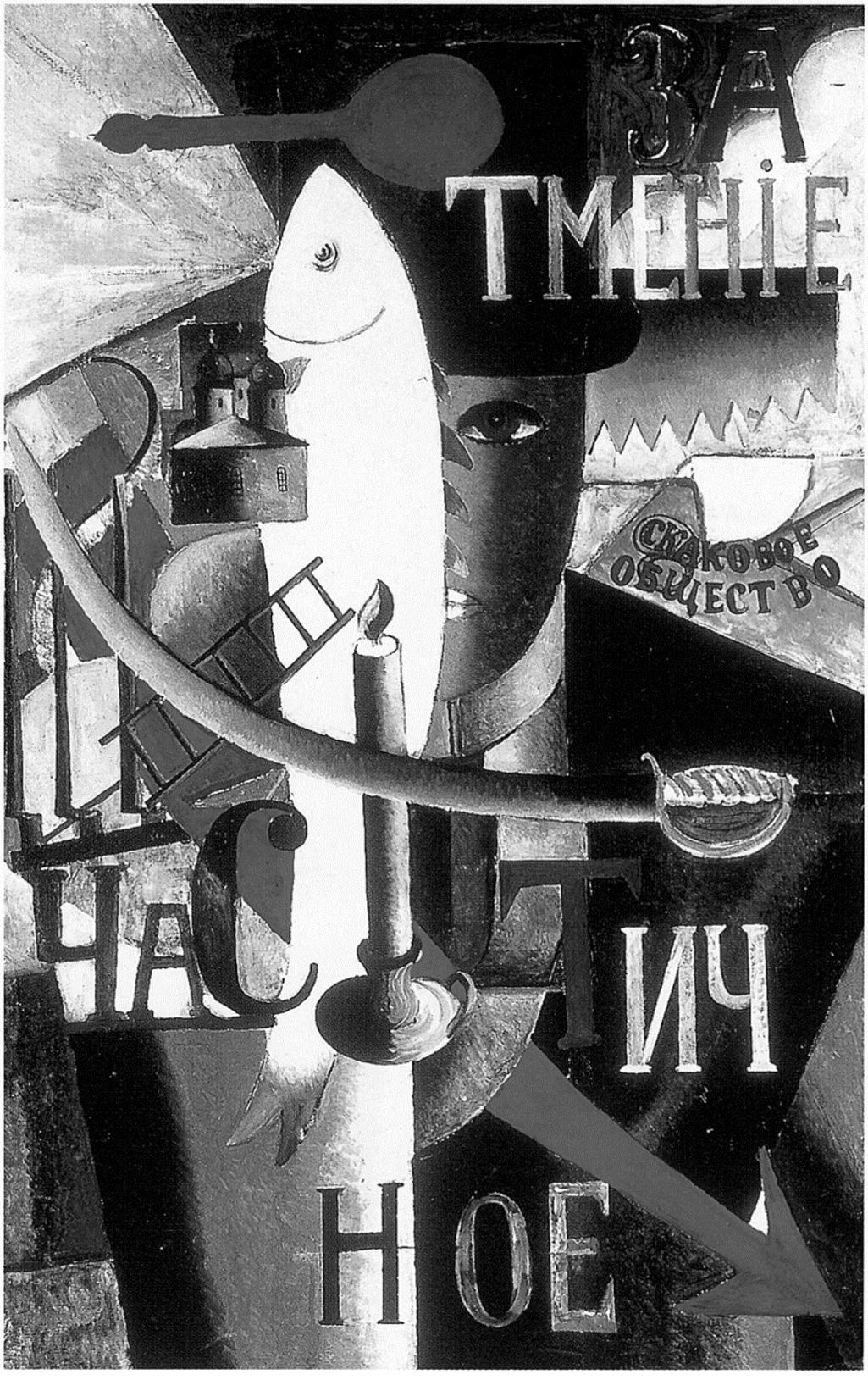

Figure 3.5 The illogical arrangements of the figures in Malevich's *Englishman in Moscow* of 1914. Oil on canvas, 88x57 cm, Amsterdam, Stedelijk Museum. From *Kasimir Malevich, Life and Work*, Jeannot Simmen, Kolja Kohlhoff, (1999), p. 37.

In September 1913, owing to the article published in *Apollon* under the title "The 'New' Art and the Fourth Dimension" by the conservative critic Sergei Makovsky, it appears that the fourth dimension in Russia has been regarded simply as "time" and "numberless series of positions at various moments in time" with the effect relied on Hinton's advice to destroy perspective by trying to see objects form all sides at once.[273]

Displayed at the *Union of Youth* Exhibition, which has been opened at St. Petersburg on the 10th of November, 1913, the painting *An Englishman in Moscow* which has been a product of his interest in "incorrect prespective" and "illogicality," takes Malevich to some other point: "Transrational Realism." Dalrymple Henderson describes this new condition as follows; "Here the collage origins of Synthetic cubism have made possible, an irrational overlapping of forms that vary illogically in size"[274] (Figure 3.5). In his works held until 1914 referred to as "Illogical" or "Alogist" Paintings, it particularly has been the pictorial area that was broken up and reorganized.[275] By this way, depth was flattened and size and forms were illogically overlapped. Another name whose translation of specific sections of *Du Cubism* have been published in *Union of Youth*

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[273] "There is in every three-dimensional object the possibility of numberless positions in space. But to perceive this series of positions ad infinitum the artist can only conform to the various moments of time (for example, going around an object or setting it in motion). Consequently, at a given moment an object is always imagined in some single position, i.e., not moving in time. This proceeds from the fact that the artist himself moves in time, i.e., he is in the fourth dimension. ... If, mentally, one goes out of time, i.e., becomes as it were above time, becomes unmoving in time, then just the opposite results. There occurs a mental instability of the object itself in time (a numberless series of its positions at one time for the contemplating artist), the object is not in three but four dimensions which may be expressed graphically by putting into one space (in this case the picture plane) that series of positions of the object (even if fragmentary and of course only to a certain approximation), for it is impossible to picture numberlessness. One may clearly imagine an object moving in space, for example, a wheel. **What is the movement of a wheel if not a numberless series of positions at various moments in time? You 'stop time' and these positions are combined, as it were, come together (because the wheel is one thing) and we no longer get a three-dimensional wheel, but a wheel in the 'fourth dimension.**'", Sergei Makovskii, "'Novoe' iskusstvo i 'chetvertoe izmerenie,' " *Apollon* (St. Petersburg), no. 7 (Sept. 1913), p. 57. Quoted by Dalrymple Henderson, *ibid*, p. 276. Emphases are added.

[274] Dalrymple Henderson, *ibid*, pp. 276-277.

[275] "Composition, the representation of realistic, linear perspective, was no longer defined. Far and near were on the same plane, while distant things appeared within the close-up. *The Portrait of Ivan Klyun* was painted in 1913 and shows recognizable facial features, although the parts are segmented into different spatial planes. Surfaces are re-defined to look like bent rolled steel. The spatial disposition is illogical, pictorial depth being flattened out or extended. (…) Around 1914, the pictorial space is filled with letters and a variety of objects that are subject to no sort of logic from the normal world. The letters are partly painted, partly printed letters that Malevich had cut out and stuck on." Simmen and Kohlhoff, *ibid*, p. 36.

Journal, has been the writer, painter and composer Mikhail V. Matyushin, who has been effective in circulation and popularization of Cubism at Russia owing to his article titled as "The Sensation of the Fourth Dimension." Together with Matyushin and Kruchenykh, who has been the follower of Ouspensky, an advocate of Hinton's Hyperspace philosophy in Russia, Malevich and the others have designed an opera performance, *Victory over the Sun*, which was to break all conventions, during the vacation they have altogether taken at Finland in summer of 1913.

> "Malevich appears to have incorporated the popular image of the four-dimensional hypercube on his design. Hinton had based his construction of the four-dimensional tesseract on this structure, and its use by Malevich for the second act of *Victory over the Sun* would have been particularly appropriate.
>
> (…) In the end, other of his *Victory over the Sun* designs held more promise for Malevich than did his Cubist-like construction built around a hypercube."[276]

Designing the setting as well as the costumes of the opera in an "abstract" concept, Malevich adopts a hypercube understanding in design of the stage (Figures 3.6 and 3.7). Owing to the diagonally divided black square background representing the "captured" Sun image and the square-within-a-square format, which were to provide for transition into Suprematist painting in later periods, the perspective of the scene becomes unclear.[277]

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[276] Dalrymple Henderson, *ibid*, p. 277.

[277] Scenery Sketch; Act 1, Scene 3, 1913; "The fight with the sun ends in the third scene of Act 1. For this scene, Malevich painted a design in which spatial perspective becomes wholly unclear. The drawing is dominated by black surfaces. Except for three triangles and a circle, we find no purely geometrical forms in the picture. Gravity is dissolved optically."

Scenery Sketch; Act 2, Scene 5, 1913; "...the design is confined to a diagonally divided rectangle at the back of the stage, creating a black and a white triangle. The white stands, for the sun, the black for the darkness of the future." Simmen and Kohlhoff, *ibid*, pp. 34-35.

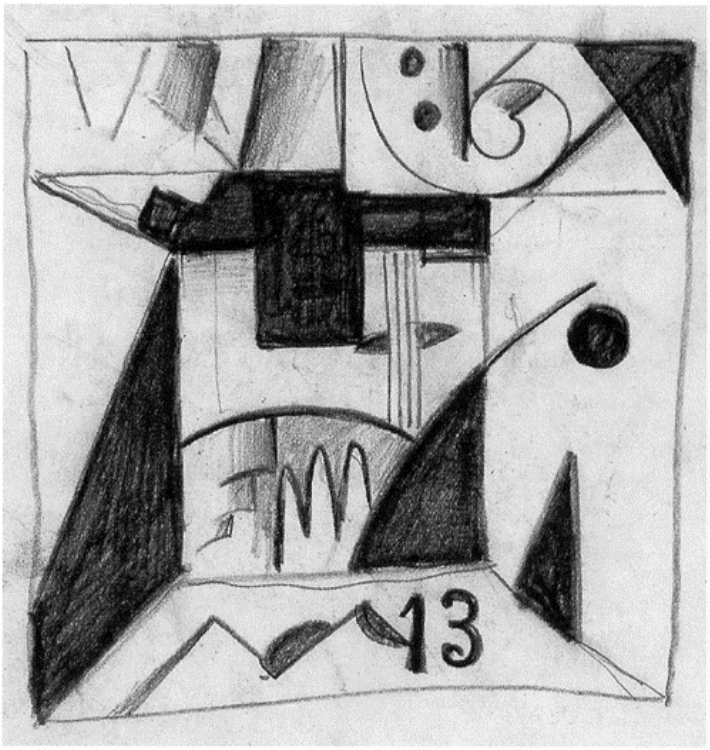

Figure 3.6 Denying any illusion of space, Malevich designed the stage area for the Opera *Victory over the Sun* by using segmented elements of the cubist set design. Scenery sketch, Act 1, Scene 3, 1913. Black chalk on paper 17,7x22,2 cm, St. Petersburg, State Museum of Music and Theater. From *Kasimir Malevich, Life and Work*, Jeannot Simmen, Kolja Kohlhoff, (1999), p. 34.

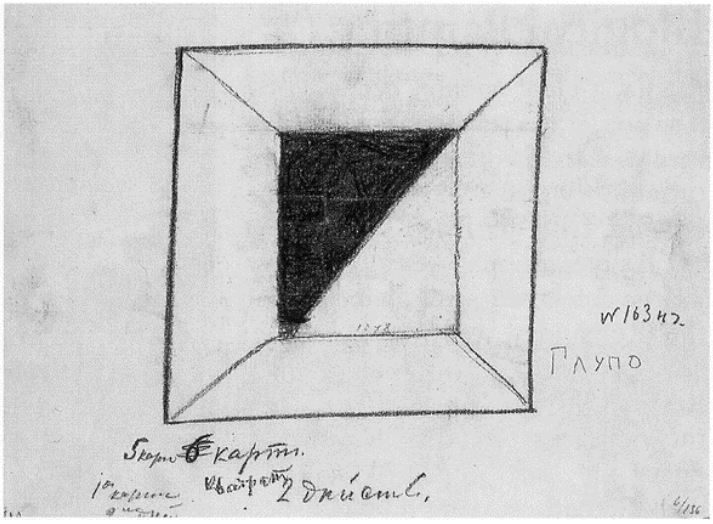

Figure 3.7 Dividing rectangle diagonally at the back of the stage, Malevich implied the Sun by using the white and the darkness of the future by using the black. Scenery sketch, Act 2, Scene 5, 1913. Charcoal pencil on paper 21x27 cm, St. Petersburg, State Museum of Music and Theater. From *Kasimir Malevich, Life and Work*, Jeannot Simmen, Kolja Kohlhoff, (1999), p. 35.

In December 1915, Malevich has exhibited his thirty-nine non-objective works for *0.10* Exhibition at the Dobychina Gallery in Petrograd and described his works as under the title of Suprematism. There, the Suprematist paintings exhibited at a separated Malevich Room were divided according to their titles into two as "Color Masses in the Fourth Dimension" (two-dimensional planar ones) and "Color Masses in the Second Dimension" (multicolored ones) (Figure 3.8). Depicting the new space of Suprematism as four-dimensional, Malevich reduced his paintings into planes and lines to let them become abstract in "geometrical sense"[278] on the one hand, he aimed at breaking off from the world of three-dimensional where gravity rules were valid[279] on the other:

> "For Malevich, Suprematism meant cosmic feeling, that is the rhythm of excitation. Everything physically real, objective, became movement, every least part of it motive power for feeling. (…) Motion, mobility, and dynamism governed modern life. Malevich wanted, in his pictures, to represent changing circumstances in paint."[280]

Malevich combines his idea of "Art without object" with social criticism in his painting *Black Square*, which reproduced firstly in a brochure titled *From Cubism and*

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[278] "It became clear to me that new frameworks of pure color painting should be created that would be constructed according to the needs of color; second, that color in its turn should proceed from a painterly confusion into an independent unit—into construction as an individual part of a collective system and as an individual part per se.

A system is constructed in time and space independent of any aesthetic beauty, experience, or mood, and emerges rather as a philosophical color system of realizing the new achievements of my imagination, as a means of cognition." Kasimir Malevich, "Suprematism" trans. by John E. Bowlt in, *Russian Art of the Avant-Garde; Theory and Critics 1902-1934*, John E. Bowlt, ed., (N.Y.: Viking Press, 1976), pp. 142-145.

[279] "If Malevich's Suprematist paintings are related to hyperspace philosophy, motion in time is an essential feature of their higher dimensionality. (…) Suprematism and the hyperspace philosophy of Hinton and Ouspensky stand as a middle ground between Cubism's spatial, geometric fourth dimension and the tradition of time itself as the fourth dimension. In Cubism time had only been a means to the end of gathering multiple views of an object, which were then juxtaposed in a single overall image. No such summation can occur in the method of hyperspace philosophy, where higher dimensional figures are created by the motion of an object into a new, higher dimension. Although time itself is not thought of as the fourth dimension, it is recognized as the manner in which movement in a fourth direction is sensed by a three-dimensional observer. The passage of time, with its implication of motion in a new dimension, is thus a vital feature of any representation of the fourth dimension in hyperspace philosophy as well as in Suprematism.

(…) Malevich, with his interest in dynamism and movement, partly inspired by Italian Futurism as well as Bergson, would have responded to a fourth dimension connected to time and motion." Dalrymple Henderson, *ibid*, p. 287.

[280] Simmen and Kohlhoff, *ibid*, p. 45.

Futurism, The New Painterly Realism in St. Petersburg in 1915. Nevertheless, he also has been influenced by Futurism's dynamism:

> "For art is the ability to create a construction that derives not from the interrelation of form and color and not on the basis of aesthetic taste in a construction's compositional beauty, *but on the basis of weight, speed, and direction of movement*.
>
> (…) Futurism opened up the 'new' in modern life: the beauty of speed. And through speed we move more swiftly.
>
> (…) Hence the construction of the futurist pictures that you have seen arose from the discovery of points on a plane where placing of real objects during their explosion or confrontation would impart a sense of time at a maximum speed."[281]

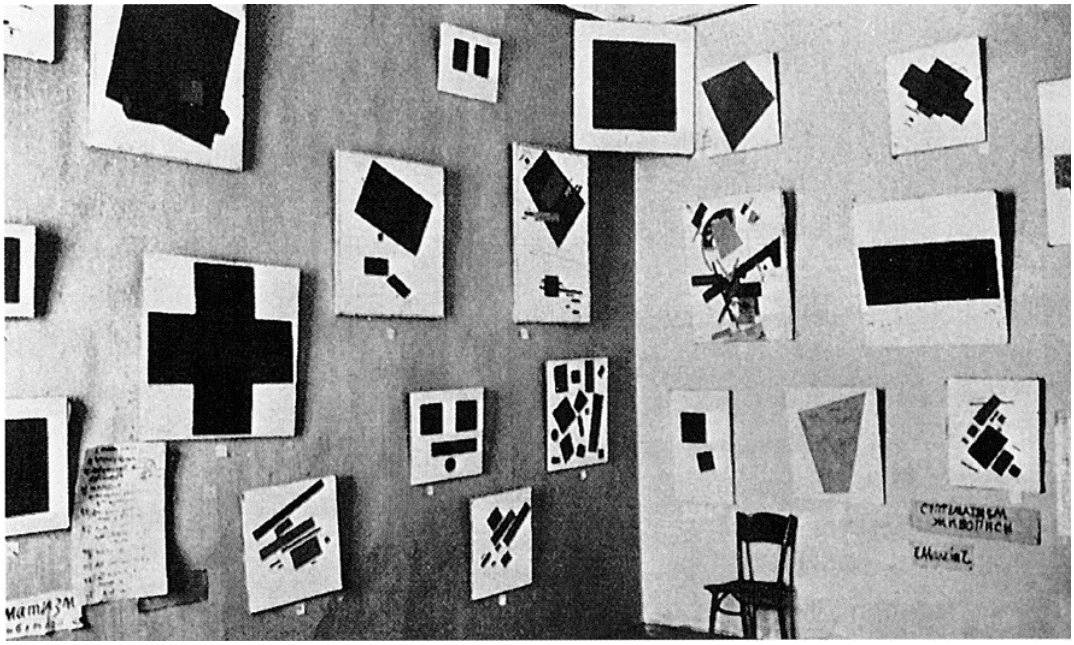

Figure 3.8 Presenting a total of thirty-nine non-objective works for the first time in the Malevich Room in *0.10* Exhibition in December 1915, at the Dobychina Gallery in Petrograd. From *Kasimir Malevich, Life and Work*, Jeannot Simmen, Kolja Kohlhoff, (1999), p. 45.

As in 1920's Einstein's General Theory of Relativity has re-orientated the worldview and become popular, Malevich in turn has incorporated his understanding of the fourth-dimension as time. In his essay on "Non-Objectivity" written in 1920s, Malevich begins

[281] Malevich, "From Cubism and Futurism: The New Painterly Realism, 1915" in *Russian Art of the Avant-Garde*, Bowlt, pp. 122-124, 127. Italics are original.

to use the concept "relativity" and relates the fourth dimension to time in the same context:

> "Thus the world's mind has built the reality of the universe, but, in order to be physically aware of this, it created three principles: gravity, negation and relativity— that is all that it was possible to invent for the time being, and to check the invention by means of observation and experiment.
> (…)The main basis of the new painterly science has discovered a new circumstance: time, and has called it the fourth dimension of the object…."[282]

After 1920, Malevich also appends Einstein's Relativity theory to his system of thought that he has combined higher dimension with the fourth dimension and reaches a hybrid synthesis:

> "…both Malevich and El Lissitzky combined the new Einsteinian temporal fourth dimension with earlier ideas on higher dimensions of space. Thus, while Malevich did adopt time as one definition of the fourth dimension in his writings of the 1920s, he also referred to a higher spatial dimension, particularly as it had been explored by the cubists. By this time Malevich had become fascinated with the notion of the cube, a form he considered a geometric abstraction 'which does not exist reality.'"[283]

> "For Malevich the cube symbolized the fuller 'six-sided' perception of Cubism, as he explained in his 1923 essay 'Contemporary Art': 'The new phenomenon or measure is a technological means for carrying out, not private trade, not three-dimensional, imitative art, but four-dimensional; not on three, but on six planes, not a half-cubic, but a cubic form, this will be the new realism of our time."[284]

Malevich's belief in cubic form during the early 1920's has been embodied in *Arkitectons,* standing for his transition from Suprematism to architecture, what he also

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[282] Malevich, "Non-Objectivity" [ca. 1923-1925], in *K. S. Malevich: The World as Non-Objectivity (Unpublished Writings-1922-25)*, Troels Andersen, ed., trans. by Xenia Glowacki-Prus and Edmund T. Little (Copenhagen: Borgen, 1976) Vol.III of *Essays on Art*, pp. 63, 75-76. Quoted by Dalrymple Henderson, *ibid*, pp. 291-292.

[283] Malevich, "Appendix: From the Book on Non-Objectivity" (1924), in *The World as Non-Objectivity*, p. 355. Quoted by Dalrymple Henderson, *ibid*, p. 293.

[284] Malevich, "Contemporary Art" (1923), in *The World as Non-Objectivity*, p. 206. Quoted by Dalrymple Henderson, *ibid*, pp. 293-294.

sees as "the Suprematist art of spatial construction" and in his *Planits* (the dwelling of the future)[285] (Figures 3.9 and 3.10):

> "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. 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 on a small area of its lower surface, and so on. A negation of symmetry, a fresh approach to gravity — with the visually 'weighty' above the apparently 'light'— the rich opportunities offered by light and shade, contrasting differences of scale, the constantly changing 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 with its symmetry, its clearly defined facades, its upward lightening of the composition, its 'tectonic' decoration."[286]

Another name in Russia who refers to the concept of time in relation with Einstein's Relativity Theory is Malevich's best friend, architect, painter, graphic artist, typographer, writer on art, and photographer El Lissitzky. From 1919, he taught together with Malevich on Suprematist models of architecture, at the academy of Vitebsky, which was headed before by Chagall. Owing to his friendship with Malevich, Lissitzky was trying to realize Malevich's goal to apply the "style of geometrical abstraction" on canvas, but in architecture and engineering that were under the effect of gravity. In contrast to Malevich's idea on "absolute receptacle of infinite," Lissitzky aims at founding complex interrelationships among dynamic forms that define the space in the form of *Prouns* (*proekt utverzhdeniya novogo*-project for the affirmation of the

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[285] According to Khan-Magomedov, Malevich's Suprematist compositions affect not only the Soviet architects: "By the geometric purity of their abstraction Malevich's Suprematist compositions, his Planits and Arkitectons, acted as much as a crystal does when immersed in a supersaturated solution. They precipitated the latent abstract tendencies in the Dutch De Stijl group, the German Bauhaus, and many soviet architects, Ladovsky, Leonidov, Melnikov, Lissitzky, Ginzburg, Nikolsky, Ilya Golosov, Rudnev, Khidekel, and Ivan Fomin among them." Selim O. Khan-Magomedov, *Pioniere der sowjetischen Architektur*, (Dresden: VEB Verlag der Kunst, 1983) trans. as *Pioneers of Soviet Architecture; The Search of New Solutions in the 1920s and 1930s*, (London: Thames and Hudson, 1987), pp. 63-64.

[286] Khan-Magomedov, *ibid*, p. 64.

new), which he has considered as the indefinite space and has realized it firstly in 1919.[287]

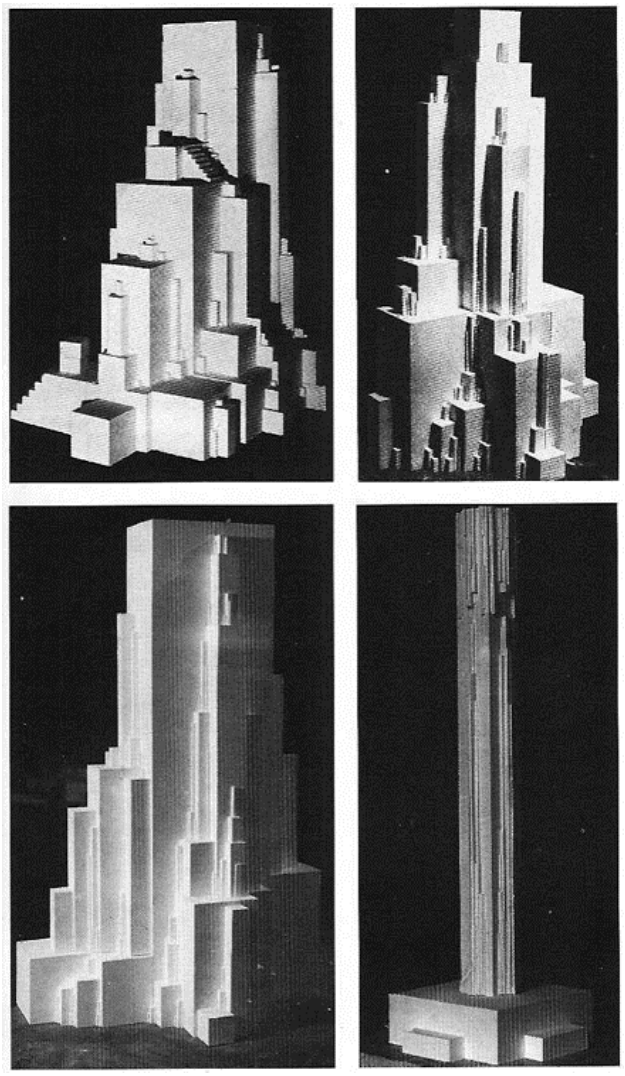

Figure 3.9 The models of Vertical *Arkitecton* of Kasimir Malevich's Suprematist Architecture in mid-1920's. From *Pioneers of Soviet Architecture; The Search of New Solutions in the 1920s and 1930s*, Selim O. Khan-Magomedov, (1987), p. 35

[287] "He [Lissitzky] arranged geometric colored surfaces and bodies in the picture, so that they developed a dynamic spatial effect. In the painted visions of space, the connection between art and architecture was to become manifest. These non-objective space-time images were to give expression to the idea of Socialism. Lissitzky subsequently called the works *Proun*. 'Proun is the interchange station from painting to architecture,' he wrote in 1924. *Proun* was a neologism made from 'Pro' and UNOVIS. UNOVIS, which means 'innovators in art,' was a group that was founded by Malevich." Simmen and Kohlhoff, *ibid*, p. 54.

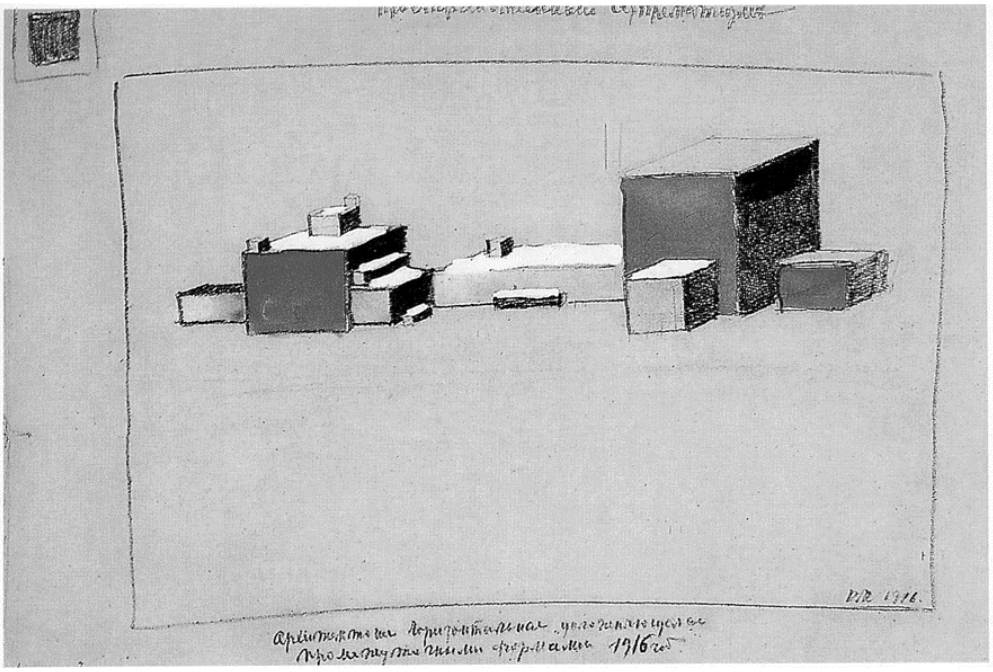

Figure 3.10 Malevich differentiates each surface of the cube by using white, red and black colors to define the formal criterion of Suprematist architecture. From *Kasimir Malevich, Life and Work*, Jeannot Simmen, Kolja Kohlhoff, (1999), p. 35.

In his manifesto titled as "Suprematism in World Reconstruction" published in 1920, El Lissitzky claims that this dynamic architecture can be founded via "the rhythmic arrangement of space and time."[288] According to him, time as a provider of this rhythmic arrangement is related to the way modern man perceives the space concept.[289] In his manifesto, after his critics stating "cubism and futurism seized upon the purity of

[288] Lissitzky gives hints of his interest in "solar spectrum" and physics, and for later periods, in Einstein's Relativity. "This dynamic architecture provides us with the new theatre of life and because we are capable of grasping the idea of a whole town at any moment with any plan the task of architecture— the rhythmic arrangement of space and time— is perfectly and simply fulfilled for the new town will not be as chaotically laid out as the modern towns of north and south america but clearly and logically like a beehive. The new element of treatment, which we have brought to the fore in our painting will be applied to the whole of this still-to-be-built world and will transform the roughness of concrete the smoothness of metal and the reflection of glass into the outer membrane of the new life. The new light will give us new colour and the memory of the solar spectrum will be preserved only in old manuals on physics." Lissitzky, "Suprematism in World Reconstruction, 1920" in *Russian Art of the Avant-Garde*, Bowlt, pp. 151-158.

[289] "(...) the scale gives life to organism, remains whole or is destroyed—it holds all the parts together. The index for the growth of modern man is the ability to see and appreciate the relative scales of everything that has been made. It is right that this perceptivity shall pass judgement on man's concept of space on the way he reacts in time." Lissitzky, "Suprematism in World Reconstruction, 1920" in *El Lissitzky: Life, Letters, Texts*, Sophie Lissitzky-Küppers, ed., (London: Thames and Hudson, 1980), p. 333.

form treatment and colour and built a complicated and extensive system with them, combining them without any regard for harmony," Lissitzky makes a suggestion for the new subject-object relationship, which were to constitute the basis of his future works like *Abstract Cabinet*, to render the beholder as mobile and to stabilize the art object; "(…) we, on the last stage of the path of suprematism blasted aside the old work of art like being of flesh and blood and turned it into a world floating in space. We carried both picture and viewer out beyond the confines of this sphere and in order to comprehend it fully the viewer must circle, like a planet round the picture, which remains immobile in the centre."[290] As for his essay "A.[rt] and Pangeometry" in 1924, he rejects the fourth dimension explanation he has taken over from Malevich and headed towards to Einstein's Relativity[291]:

> "Proun advances toward the construction of a new space, and by dividing it into the elements of its first, second, and third dimensions passing through time, it (the Proun) constructs a many-sided but unified image of nature."[292]

> "…Proun goes beyond painting and the artist on the other hand and the machine and the engineer on the other, and advances to the construction of space, divides it by the elements of all dimensions, and creates a new, many-faceted unity as a formal representation of our nature"[293]

The two important characteristics that distinguish Lissitzky's understanding of time after 1924 from Malevich's and the others', are that firstly Lissitzky could become aware of the differences between the time conceptions of hyperspace geometry and modern physics in a manner as explicit as no one could ever do before and secondly

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[290] Lissitzky, "Suprematism in World Reconstruction, 1920" in *Russian Art of the Avant-Garde*, Bowlt, p. 155.

[291] As a person who has begun studying history of geometry during the days he was being treated for tuberculosis in Switzerland in 1924, Lissitzky, rejects higher spatial dimensions and incorporates his explanation of Fourth dimension with space-time continuum. "…the multidimensional spaces existing mathematically cannot be conceived, cannot be represented, and indeed cannot be materialized." We can change only the form of our physical space, but not its structure, its three-dimensional property." Lissitzky, "A.[rt] and Pangeometry," p. 355.

[292] Lissitzky, "Proun", unpublished manuscript with supplementary inscription. "Paper delivered at session of Inkhuk [Moscow Instute of Artistic Culture], 23 October 1924"; trans. Bowlt, in *El Lissitzky*, Galerie Gmurzynska, Cologne, 9 April-30 June 1976, p. 70. Quoted by Dalrymple Henderson, *ibid*, p. 295.

even that after becoming aware of the theoretical blending called as Minkowski's *space-time continuum*, he could properly decipher the interchangeable[294] structure of space and time in Einstein's theory, which otherwise would continue to be perceived separately:

> "…Lissitzky realized that even though the space-time continuum required four-dimensional geometry for its mathematical representation, Einstein was not advocating the existence of a fourth spatial dimension. Thus, for Lissitzky, the link that the hyperspace philosophers Hinton and Oupensky had made between time and space no longer seemed relevant."[295]

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[293] Lissitzky, "PROUN; Not world visions, BUT — world reality" (1920), *De Stijl*, no. 6, (June 1922), in *El Lissitzky: Life, Letters, Texts*, Lissitzky-Küppers, p. 348.

[294] "In his 1905 paper 'On the Electrodynamics of Moving Bodies,' Einstein first presented his Special Theory of Relativity. The theory's main features were, first, to preserve the Galilean principle of relativity. According to this principle, the uniform motion of any inertial system (a space-time reference frame) can be discerned only by referring to a point that lies outside the system. By the same token, motion of any kind *within* an inertial system derives its value only in relation to points also in that system. And finally it states that the laws that determine the values of any state of motion are invariant for all inertial systems. To this theory—the cornerstone of classical mechanics—was added Relativity's second important feature, the principles of Lorentz's transformation equations, which provided a simple theorem for relating and transforming time and space coordinates from one inertial system to another. The radicality of Einstein's adaptation lay in quantifying the elastic deformation of bodies and the actual deformation (dilation) of time at high speeds. By adding a third principle whose derivation goes back to James Clerk Maxwell— the constancy of the velocity of light in empty space—Einstein was able to formulate the Special Theory of Relativity.

The theory's radicality lay in freeing time itself of its metaphysical and absolute character and reducing it to but one more dependent (i.e., variable) coordinate in the kinematical transformation equations. The new four-dimensional continuum developed in this theory differed from that of classical mechanics in the following way: time and space were no longer, at least algebraically, heterogeneous; the continuous four-dimensional manifold could no longer be separated into a three-dimensional section evolving in one-dimensional time, where 'simultaneous' events are contained only in the former; each inertial system, rather, would now express its own particular time determined as a mutual relation of events to the frame in which they are registered. Events occurring simultaneously can thus be said to do so only with respect to a single inertial system into which they are arbitrarily grouped and outside of which any notion of 'now' becomes meaningless. By making time in this way relative and contingent, **space-time and the field were conceived as a new entity, irreducible to their component dimensions**, objectively **unresolvable** with respect to their infinitely varied regions (different speeds = different times), and thickened to consistency by the world-lines* that career through them." Kwinter, *ibid*, pp. 56-57. Italic is original. Emphases are added.

* "The term world-lines was coined by H. Minkowski in his famous article, 'Space and Time' (1908), which gave the first mathematical formulation of space-time. Minkowski defined a world-point as a point in space at a point in time (a system of values *x,y,z,t).* Attributing the variations *dx, dy, dz* to conform to the value *dt*, this point would describe 'an everlasting career' that he named a world-line. 'The whole universe is seen to resolve itself into similar world-lines, and I would fain anticipate myself by saying that in my opinion physical laws might find their most perfect expression as reciprocal relations between these world-lines.' Lorentz, et al., *The Principle of Relativity*, p. 76." Kwinter, *ibid*, p. 57, fn. 6.

[295] Dalrymple Henderson, *ibid*, p. 296.

In 1924, Lissitzky suggests the new and dynamic space where time is the key ingredient meant to be the motion of objects, and terming it as "imaginary space," he reveals it as a "new expression of space." Imaginary surface and solid are produced by rotation. Imaginary space appears to be so temporal that it would exist only as long as the object is in motion. "The term *imaginary* thus refers to the transitory nature of the space, while at the same time reflecting a scientific connection"[296] Thus, Lissitzky's object in motion and the fourth dimension he has added temporal ingredient to are then also represented by physical motion.[297] Lissitzky applies the way he adds temporal ingredient in art by means of physical motion in two exhibition spaces, one titled as "Proun Room"[298] he has prepared for *Grosse Berliner Ausstellung* in 1923 and the other as *Abstract Cabinet* [299] prepared for Hanover Landesmuseum in 1928. His perception of

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[296] Dalrymple Henderson, *ibid*, p. 297. Italic is original.

[297] "We are faced with the task of creating spatial architecture which is not only seen by eye from a distance, as in painting, and not only touched by the hands, as in sculpture, but among which people live and move —an architecture of space and time. To this end, steel and ferro-concrete frames may provide us with excellent tools." Lissitzky, "The Architecture of the Steel and Ferro-concerete Framework", *Stroitelnaya promyshlennost* [Building Industry] (1926), no. 1, pp. 59-63 in *Pioneers of Soviet Architecture*, Khan-Magomedov, p. 561.

[298] "In October 1922, during Lissitzky's first trip to Hanover, Schwitters introduced him to Eckard von Sydow, president of the Kestner Society, and to Alexander Dorner, director of the Provinzialmuseum, who would become one of Lissitzky's great patrons. Through Schwitters, Lissitzky also met his future wife, Sophie Küppers, widow of the former president of the Kestner Society and an instrumental figure in planning his exhibition. Lissitzky exhibited a group of *Proun* paintings made between 1919 and 1922, and by all accounts, the show was a great success. Several works sold to members of the society, who, according to Küppers' account, were accustomed to thinking of Russian culture in terms of dark expressionism and mysticism; Lissitzky's paintings, with their rational and precise composition, were therefore a revelation.

In March, one month after the exhibition closed, the Kestner Society invited Lissitzky back to Hanover to lecture on Russian art. His talk, entitled 'New Russian Art,' was based upon the important First Russian Exhibition, which had opened at the Van Diemen Gallery in Berlin in October 1922. (…) Inspired by the positive reception of Lissitzky's exhibition and lecture, von Sydow and Dorner asked him to create a portfolio of lithographs to be offered to members of the Kestner Society as a means of raising money. Known as the *First Kestnermappe* (*Kestner Portfolio* or *Proun Portfolio*), it included six lithographs plus a cover and title page and was published in an edition of fifty in the summer of 1923. Printed in rich reds, blacks, and grays, the works reflect the diversity of approaches Lissitzky used in formulating the *Prouns*, from Suprematism to anthropomorphized abstractions. One sheet in particular, however, stands out: the *Proun* is turned into an axonometric architectural rendering. This image documents an installation Lissitzky had created that prior spring for the Grosse Berliner Kunstaustellung (Great Art Exhibition in Berlin), at the invitation of the Novembergruppe. Known as the 'Proun Room,' it gave Lissitzky the first opportunity to deploy his compositional thinking in real space." Matthew Drutt, "El Lissitzky in Germany, 1922-1925" in *El Lissitzky; Beyond the* Abstract Cabinet*: Photography, Design, Collaboration*; Margarita Tupitsyn, (New Haven: Yale Uni. Press, 1999), p. 13.

temporal fourth dimension as physical motion would then avail Lissitzky for establishing relations with and getting closer to the Constructivists, among whom Moholy-Nagy took place; Naum Gabo ve Anton Pevsner[300] who dealt with kinetic sculpture; and in context of four-dimensional possibilities in films, the filmmakers Viking Eggeling, Hans Richter and Sergei Eisenstein, the creator of filmic montage. The idea of temporality, within which the founders of Synthetic Cubism Gino Severini and other artists in Paris have tried to theorize the spatial fourth dimension, seems to have been pursued along a different channel in Russia and be connected to the fourth dimension, all with the help of El Lissitzky during the 1920s.

Apart from Lissitzky, another important name, who has wanted to relate the Fourth dimension and the time concept with architecture, a field other than art, is Theo Van Doesburg from Netherlands. As part of *De Stijl* Movement, which has been established during the summer of 1917 by the painters Theo Van Doesburg, Piet Mondrian, Bart van der Leck and Vilmos Huszar, the architect J.J. Oud and the essayist Anthony Kok, the first issue of their influential periodical *De Stijl* has been published in October, 1917.[301] Different from Cubism, their objectives were absolute universality, universal

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[299] "Here [Proun Room] the viewer's movement around a room assured his experiencing a Proun's dynamic composition. In 1926 and 1927-1928 Lissitzky explored such ideas further in two exhibition spaces in which the walls were covered with strips painted either black, gray, or white on each face. This wall texture, perfected in the 1928 'Abstract Cabinet' for the Hannover Landesmuseum, created an ever-changing, dynamic background for the exhibited paintings. Furthermore, various parts of walls were movable so that the viewer could adjust the positioning of the artworks." Dalrymple Henderson, *ibid*, p. 296.

[300] In their *The Realistic Manifesto* published in 1920, Naum Gabo and his brother Anton Pevsner aimed at letting Space and Time be reborn in reply to the Futurists' "Space and Time are yesterday's dead", which they proclaimed by exalting speed: "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. (...) *The realization of our perceptions of the world in the forms of space and time is only in of our pictorial and plastic art.* (...)We affirm *in these arts a new element the kinetic rhythyms as the basic forms of our perception of real time*." Naum Gabo, Anton Pevsner, "The Realistic Manifesto, 1920" in ed. and trans. John E. Bowlt, *ibid*, pp. 208-214. Italics are original.

[301] "A friendship had grown up between Theo van Doesburg and the painters Piet Mondrian and Bart van der Leck, who were then working in Laren: Van Doesburg often visited them in their studios and the three painters exchanged experiences, pooled their achievements, and in this way evolved a new style. On the strength of this, Van Doesburg, together with Mondrian and the painter Vilmos Huszar, the architect J. J. Oud and the essayist Antony Kok, started the group 'De Stijl'. They were joined almost at the same time, 1917-18, by Bart van der Leck, the Belgian sculptor Georges Vantongerloo, and the Dutch architects Jan Wils and Robert van't Hoff. In August 1917 the 'De Stijl' group made its first public appearance with its journal of the same name. In November 1 918 the first 'De Stijl' manifesto appeared with its stirring opening words: 'There is a consciousness which belongs to the old days and another which belongs to today. The old one is aligned with the individual. The new one is aligned with the universal. The struggle of the individual against the universal is as apparent in the world war

harmony and total abstraction in art in order to erase all traces of subjectivity. The fourth dimension has first been mentioned in *De Stijl* literature by Van Doesburg's article "Great Masters of Plastic Art" in *Eenheid* in December 1917:

> "…Man as the appearance back, no fixed point at all toward which he could define a dimension. This explains why in expressing the spiritual, in making spirit an artifact, he will be forced to a moto-stereometric form of expression. This moto-stereometric form of expression represents the appearance of a 4-n dimensional world in a world of three dimensions."[302]

Van Doesburg's "moto-stereometric" form of expression implies that he was informed of Poincaré's "motor space" and Metzinger and Gleizes's *Du Cubisme*, the protagonists in use of Poincaré's motor space in early Cubist theory. Apart from this, Mondrian's letter to Van Doesburg in 1917 has included the following lines: "Maybe later you could write on the four-dimensional matter better than I do. I have much sympathy for your idea that 'the negative' represents the fourth dimension, but I am unable to write about it. I do, however, have this approach in my work"[303] As manifest in these lines, the interplay between figure and ground and the objects are perceived as "negative representation" by their absence and shadows, just as in Analytic Cubism[304] (Figures 3.11 and 3.12).

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as it is in the art of our time.'" Hans L.C. Jaffé, "Postscript; Theo van Doesburg", in *Principles of Neo-Plastic Art*, Theo van Doesburg, (New York: New York Graphic Society Ltd., 1968), p. 70.

[302] Van Doesburg, "Grootmeesters der beeldende Kunst," *Eenheid*, no. 392, (8 Dec. 1917), in *Theo van Doesburg*, Joost Baljeu, (New York.: Macmillan Publishing, Co., 1974), p. 27. Quoted by Dalrymple Henderson, *ibid*, p. 314.

[303] Mondrian letter to Van Doesburg, 12 Dec. 1917, in "Fourth Dimension in Neo-plasticism," Joost Baljeu, *Form*, no. 9 (April 1969), p. 8. Quoted by Dalrymple Henderson, *ibid*, p. 315.

[304] In his example given for "The Elementary Expressional Means of Sculpture" Van Doesburg proliferates the duality of "Positive: Volume, Negative: Emptiness" in the Figure used for "The Elementary Expressional Means of Architecture" as "Positive: Line, Plane, Volume, Space, Time; Negative: Emptiness, Material". However, with the hope that the duality existing in most early avant-garde will be overcome, he presents "harmonious unity" as a synthesis:

"If the bounds of the expressional means proper to an art are overstepped the form of art will be impure and not genuine.

Thus the pure expressional means of music is: 'Sounds (positive) and non-sound' (negative). The composer expresses his aesthetic experience through relationships between sounds and non-sound. - The pure expressional means of painting is colour (positive) and non-colour (negative). The painter expresses his aesthetic experience through relationships between coloured and uncoloured planes.*

The pure expressional means of architecture is plane, mass (positive) and space (negative). The architect expresses his aesthetic experience through the relationships of planes and masses to internal spaces and to space.

During his visit to Bauhaus in January 1921, Van Doesburg gives a lecture on his essay "The Will to Style: The Reconstruction of Life, Art and Technology" published in *De Stijl* in 1922 and there he mentions the importance of Relativity Theory for the first time: "As a result of the scientific and technical widening of visions, a new and important problem has arisen in painting and sculpture beside the problem of space, and that is the problem of time."[305] Parallel to the belief of Lissitzky in attaining a synthesis and unity between space and time via cinematic motion of the movie, Doesburg as well regards motion of time as the fourth dimension: "Efforts are also being made to perfect this modern art of movement in film. Here, too, new artistic form is being created from the combining of the impetus of space and time (example: V. Eggeling and Hans Richter). ...Using film techniques in the painting of pure form gives the art a new ability: the artistic solution of the dichotomy of static and dynamic, of spatial and temporal elements, a fitting solution to the artistic needs of our time."[306]

The pure expressional means of sculpture is volume (positive) and non-volume or space (negative). The sculptor expresses his aesthetic experience through the relationships of volume to space (within a space). †

These and other arts (poetry, the dance, theatre, and film) are the forms we give to aesthetic experiences of reality."

* "We call 'colour' all the bright tones (or, to be more precise, red, blue, and yellow); 'non-colour': black, white, and grey."

† "Thus to break down the artistic means into a positive and a negative element serves only as a means of defining as exactly as possible the essential values of the expressional means. This duality can obviousiy be received in the work of art. Creative activity can bring about an interchange between, the two- This means: the negative element, e.g., non-coloured planes in painting, can becomes positive and thus *equal in value* to the contrasting element (in our example, colour).

Formation (*Gestaltung*) is essentially: **the balancing of positive and negative to achieve exact harmonious unity**." Theo van Doesburg, *Grundbegriffe Der Neuen Gestaltenden Kunst*, Bauhausbücher 6, (Münich: Albert Langen, 1925); translated by Janet Seligman as *Principles of Neo-Plastic Art*, (N.Y.: New York Graphic Society Ltd., 1966), p. 15. Italics and emphases are original.

[305] Van Doesburg, "The Will to Style: The Reconstruction of Life, Art and Technology," *De Stijl*, v/2 (Feb. 1922) and v/3 (March 1922), reprinted in *De Stijl*, Hans L.C. Jaffé, ed., (N.Y.: Harry N. Abrams, 1971) p. 154. Quoted by Dalrymple Henderson, *ibid*, p. 322.

[306] Van Doesburg, "The Will to Style" in *De Stijl*, Hans L.C. Jaffé, ed., p. 162. Quoted by Dalrymple Henderson, *ibid*, p. 322

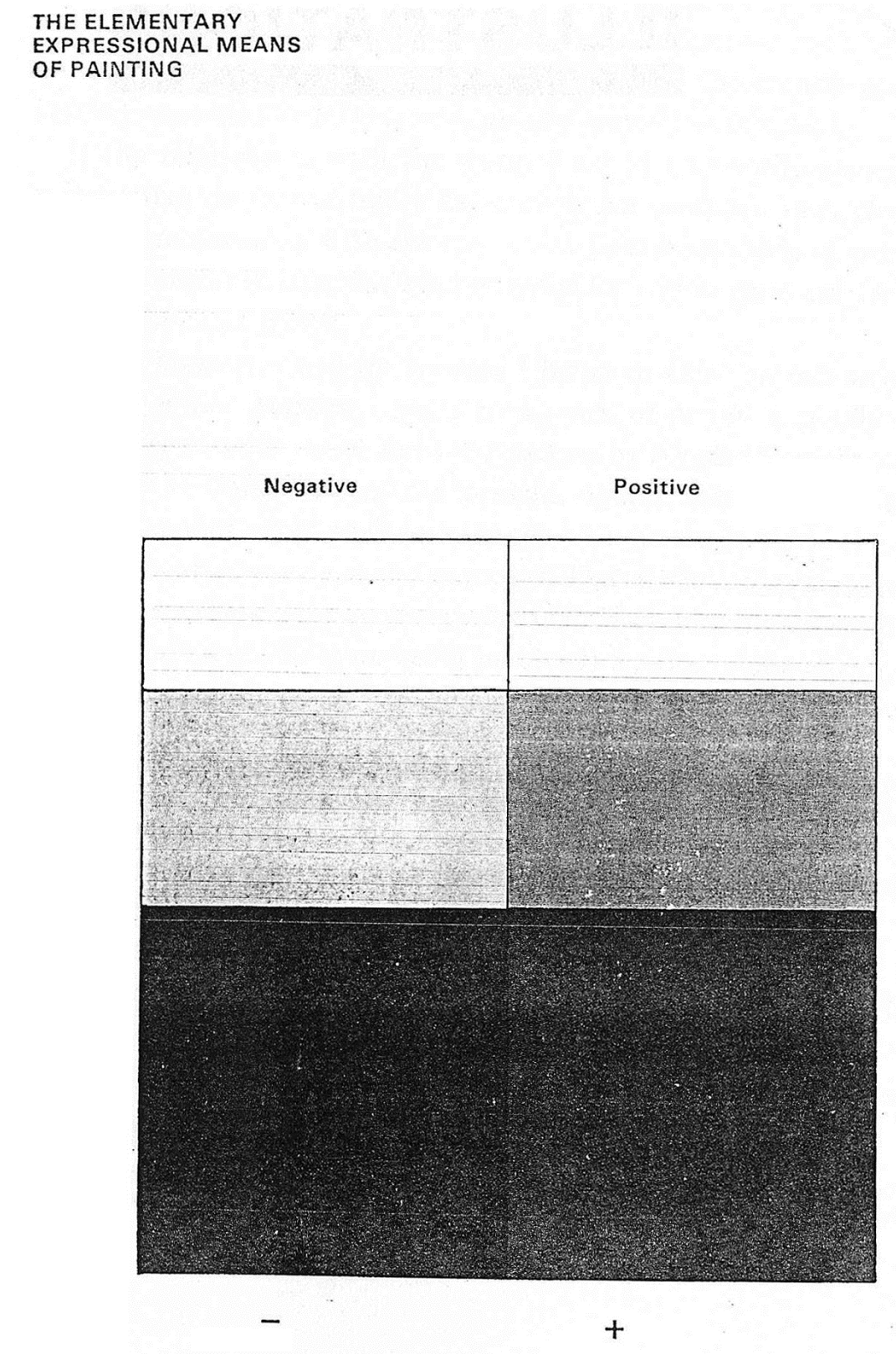
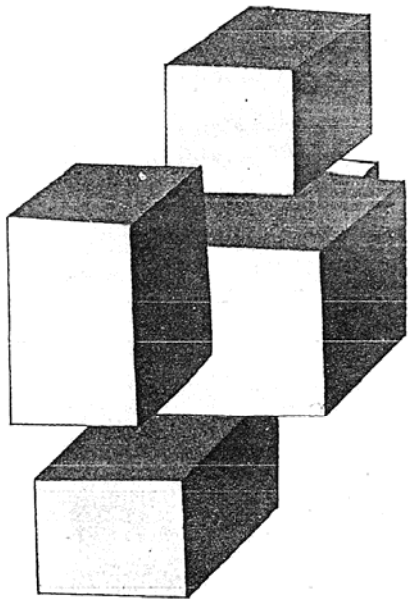


Figure 3.11 Negative and Positive as Van Doesburg's elementary expressional means of painting. From *Principles of Neo-Plastic Art*, Van Doesburg, (1968), p. 42. Fig. 1.



THE ELEMENTARY EXPRESSIONAL MEANS OF SCULPTURE

Positive = volume
Negative = emptiness

THE ELEMENTARY EXPRESSIONAL MEANS OF ARCHITECTURE

Positive: line, plane, volume, space, time
Negative: emptiness, material

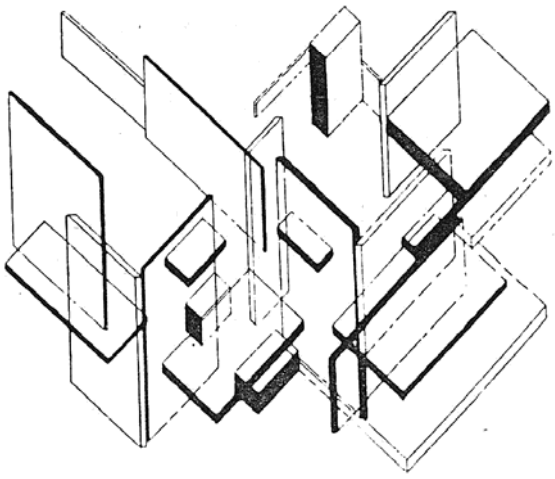


Figure 3.12 Negative and Positive as Van Doesburg's elementary expressional means of sculpture and architecture. From *Principles of Neo-Plastic Art*, Van Doesburg, (1968), p. 43. Fig. 2 and 3.

In his article "L'Evolution de l'architecture moderne en Hollande" published in the magazine *L'Architecture Vivante* in 1925, Van Doesburg lists the characteristics of the new architecture of four-dimensional world of space-time as follows:

> "10. TIME AND SPACE.—The new architecture takes account not only of space, but also of time as an architectural value. The unity of space and time gives architectural vision a more complete aspect.
>
> 11. THE PLASTIC ASPECT is obtained by the fourth dimension of space-time. . . .
>
> 13. ASTATIQUE.—The new architecture is anticubic, in other words, its different spaces are not contained within a closed cube. On the contrary, the different cells of space (balcony volumes, etc., included) develop excentrically, from the center to the periphery of the cube, so that the dimensions of height, width, depth, and time receive a new plastic expression.
>
> Thus, the modern house will give the impression of floating, suspended in air, in opposition to the natural force of gravity.
>
> 14. FRONTALISM.—In contrast to frontalism, born from a static conception of life, the new architecture achieves great richness by polyhedral plastic development in space-time.
>
> 15. COLOR. . . .The new architecture uses color organically. Color is one of the elementary means in rendering visible the harmony of architectural relationships. Without color, proportional relationships do not have a living reality. It is by color that architecture becomes the fruition of all plastic researches in time as well as in space. . . .
>
> With the birth of modern architecture the painter-constructor found his true field of creative action. He organizes color aesthetically in space-time and makes a new dimension visible plastically. . . .
>
> 17. ARCHITECTURE AS A SYNTHESIS OF PLASTIC CONSTRUCTION. . . .The Neoplastician is convinced that he constructs in the domain of space-time and that presumes the ability to move about in the four dimensions of space-time."[307]

In addition to the theories he has blended, though Van Doesburg explains the innovation he perceived as "polyhedral plastic development," as non-Euclidean geometry, as a matter of fact he makes use of the faceted cubes of *n*-dimensional geometer Jouffret (Figure 3.13):

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[307] Van Doesburg publishes his article "Tot een Beeldende Architectuur," which he firstly had published in 1924 in magazine *De Stijl* and listed sixteen considerations on De Stijl architecture, this time under the name "L'Evolution de l'architecture moderne en Hollande" in magazine *L'Architecture Vivante* in 1925 where he has added the seventeenth point. The item numbered 13 is originally "Astatique." Van Doesburg, "Tot een Beeldende Architectuur," *De Stijl*, vi/6-7 (1924), pp. 78-83; trans. as "Towards a Plastic Architecture," in *De Stijl*, ed. Jaffé, pp. 185-88; Van Doesburg, "L'Evolution de l'architecture moderne en Hollande," *L'Architecture Vivante*, (Autumn and Winter 1925), p. 125. Cited in Dalrymple Henderson, *ibid*, pp. 323-324.

> "In a future period in the development of modern architecture the plan will disappear. The composition of space projected in dimensions by a horizontal cut (the plan) will be replaced by an exact calculation of the construction. Euclidean mathematics will no longer be of use to us, but thanks to non-Euclidean calculations in four dimensions, construction will be simpler."[308]

In 1926, he passes on to the Elementarist style, which he regards as to be more dynamic than Neoplasticism. In his manifesto connecting Elementarism with the space-time world of Relativity Theory under the title "Painting and Plastic art," he offers Elementarism as encountering the balanced unity he has been searching for:

> "Rather than denying the existence of time and space, Elementarism recognizes these factors as the most elementary of a new plasticism. Just as Elementarism tries to bring the two factors, statics and dynamics (rest and movement), into a balanced relationship, so equally does it strive to combine these two elementary factors, time and space, into a new dimension. While the expressive possibilities of Neoplasticism are limited to two dimensions (the plane), Elementarism realizes the possibility of plasticism in four dimensions, in the field of time-space."[309]

Leaving aside horizontal-vertical frontality and then regarding the axonometric perspective's free-floating existence on paper as breaking off from gravity and earthbound, Van Doesburg views oblique-based diagonality as the dynamic origin of Elementarism. Dating to the times close to his death in 1931 however, with the realization that these characteristics of Elementarism, which become real in paintings, do not account for architecture, Van Doesburg considers that the most appropriate medium for the "four-dimensional space-time continuum" appears to be the film's fourth dimension. Just as colour and sound, he thinks that the two additional new ingredients for film constitute such innovations that are crucial for creating the "light-space film continuum" that would be equivalent to the "space-time continuum":

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[308] Van Doesburg, "L'Evolution de l'architecture moderne en Hollande," p. 18. Quoted by Dalrymple Henderson, *ibid*, p. 326.

[309] Van Doesburg, "Painting and Plastic Art: Elementarism," *De Stijl*, vii/78 (1926-1927), in *De Stijl*, ed. Jaffé, pp. 213-214. Quoted by Dalrymple Henderson, *ibid*, p. 336.

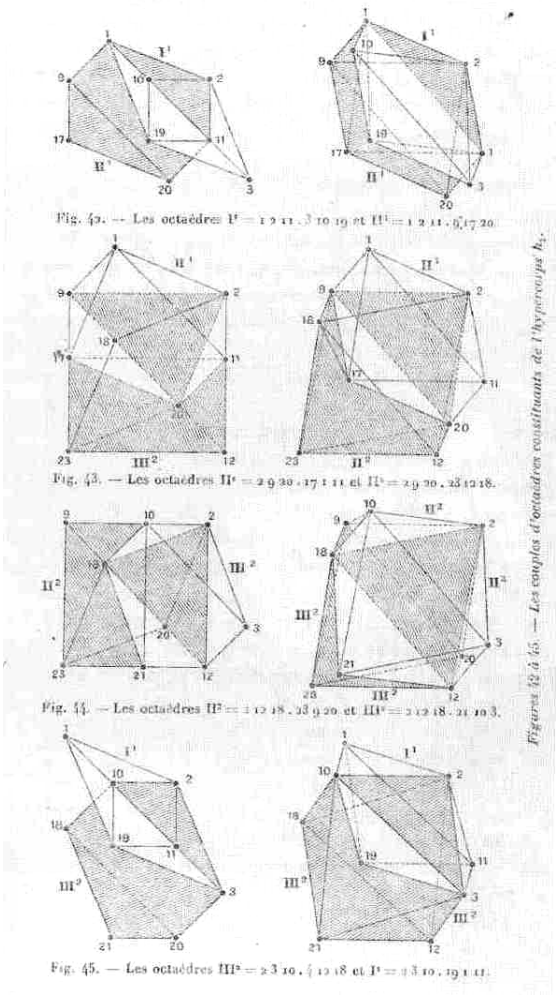

Figure 3.13, 24 projections of the pairs of octahedra constituting the hypersolid h_2, illustrated by Esprit Jouffret in *Traité élémentaire de géométrie à quatre dimensions* of 1903. From *The Projective Cast, Architecture And Its Three Geometries*, Robin Evans, (1987), p. 61.

"The separation of 'projection surface' is abolished. The spectator will no longer observe the film, like a theatrical presentation, but will participate in it optically and acoustically. For the film of the future is not a constant and mute form like painting, but a new expressive possibility simultaneously optical and phonetic. ...

The new experiments, geometrically orientated, succumb to laws of an almost architectural structure for a multidimensional film space. Thus, more

> scientific than artistic, they prepare the way for an orchestration of film to be developed in totally new and unsuspected dimensions."[310]

In 1920s, Van Doesburg and Lissitzky perceived of Einstein's Special and General Theories of Relativity as what has been rendered as relative via the breaking down of absolute space. According to Van Doesburg, Mondrian and Malevich, recognition of man's knowledge of space is only relative. In this manner, the phenomenon of reality, which has been discussed in terms of absolutism-relativism, seems to have been stuck in between the subjectiveness of perception and Einstein's General Theory of Relativity that they considered as an objective reality as much as universal. As stated in Van Doesburg's first *De Stijl* manifesto in November 1918, the universal harmony to be reached by means of absolute universality radically excludes individual effusions.[311] On the other hand, unlike the awareness of Lissitzky, Van Doesburg juxtaposes and blends the different theories, like Hinton's hyperspace philosophy, Minkowski's space-time continuum, and Einstein's theory of Relativity with pseudo scientific fourth dimension: "Van Doesburg found in the hypercube a theoretical model for a centrifugal 'excentric' architecture that would break out of the box of traditional building and that would require motion in time for viewing."[312] According to Dalrymple Henderson, Van Doesburg's publications since 1920 have been quite influential, despite the fact that the concept of fourth dimension has been combined with the Minkowskian space-time continuum and become widespread, due to its connections with earlier tradition of spatial fourth dimension, the "romance of many dimensions" has continued on, though with lesser influence.

In architecture, the most effective person in providing for the influential nature and even construction of the genealogy of space-time philosophy has been Sigfried Giedion and his book written in 1941, *Space, Time and Architecture*. Affected much from the writings of Van Doesburg, Giedion uses Minkowski's space-time continuum to justify his Space-time conception, which he has constructed as amounting to unification he has

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[310] Van Doesburg, "Film as Pure Form", *Die Form*, IV (15 May 1929), trans. Standish D. Lawder, in *Form* (London), no. 1 (Summer 1966), p. 8. Quoted by Dalrymple Henderson, *ibid*, p. 333.

[311] Jaffé, "Theo Van Doesburg," pp. 69-73.

[312] Dalrymple Henderson, *ibid*, p. 336.

been searching for.[313] On the other hand, through reception of the fragmentation, faceting and multipoint view techniques of Cubist painting, Giedion equates this to the simultaneity of Einstein's General Theory of Relativity. Because of the parallelism, *Zeitgeist* has accomplished under the power of rendering everything as in relation to one another within a period of time, Giedion not only transplants the concept of time to architecture, but also causes the "ill-conceived"[314] allusion where there exists a relation between architecture, art and science, a view that has been influential up to the current day.

According to Sokratis Georgiadis, who has written the "Intellectual Biography" of Giedion, the first person who has connected the concept of "time" with architecture is the art historian Paul Zucker. In his article "Der Begriff der Zeit in der Architektur" written in 1923, Zucker characterizes 'time' independent from perception, as "a 'flowing fulfillment', an ongoing function of the building once erected."[315] Adopted by Zucker as an "exact idea of purpose," "time" has become "an idea of *Telos*," which remains constant in history as an "intrinsic feature of architectural work of art":[316] "This purpose or use will always reside in the inevitable guiding of the movement of individuals or crowds of people initiated by the ground plan and vertical elevation (of a building) ... Thus there is an a *priori* connection between movement, time and purpose. In other words, the idea of a *Telos* embedded in the realm of time is from the very beginning inseparable from a work of architecture. Thus, in no way are the concepts of movement and time restricted to a subjective psychological act of optical and tactile

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[313] "In 1908 the great mathematician Hermann Minkowski first conceived a world in four dimensions, with space and time coming together to form an indivisible continuum. His *Space and Time* of that year begins with the celebrated statement, 'Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality.'" Giedion, *ibid*, p. 14.

"As was stated at the beginning of this book, it was in 1908 that Hermann Minkowski, the great mathematician, speaking before the Naturforschenden Gesellschaft, proclaimed for the first time with full certainty and precision this fundamental change of conception, "Henceforth," he said, "space alone or time alone is doomed to fade into a mere shadow; only a kind of union of both will preserve their existence." Giedion, *ibid*, p. 443.

[314] Yve-Alain Bois, "Cubistic, Cubic, and Cubist" in *Architecture and Cubism*, Eve Blau and Nancy J. Troy, eds., (Cambridge, Mass.: The M.I.T. Press, 1997), p. 191.

[315] Georgiadis, *Sigfried Giedion*, p. 117.

[316] Georgiadis, *Sigfried Giedion*, p. 117.

perception, but they are intrinsic to every space created by architecture."[317] Georgiadis starts the period during which Zucker will be transforming the space concept from being an object into a fiction:

> "He severs the linkage between the concepts of space and/or movement and the psychological and physiological process of perception, meaning the concrete experience of architectural and other kinds of space; the idea of no longer conceptualising space as a generalisation of the empirical experience of real space(s), but rather as a pure product of the architect's imagination, a fiction, creates the theoretical possibility of, and at the same time provides an art-historical legitimation for, a metaspace. The first consequence of this is that space loses a fundamental property based on the experience of the frog, the lens, the mole or the spider and thus, for example, its three-dimensionality; the second result is that the crystallisation, the concrete construction of an imagined space, does not have to be a three-dimensional object (as even Zucker still thought necessary). This paradox enables a link between art history and contemporary artistic experiments. (…) Giedion went one step further. (…) Giedion's idea (rooted in modern art and architecture) no longer had any fixed geometrical structure; movement could no longer be described in terms of geometry."[318]

Apart from Giedion, the other two names who have been influential in availing for space-time philosophy to become widespread is the Bauhaus educator, painter, sculpturer, and writer of *Von Material zu Architektur*[319] and *Vision in Motion*,[320] László

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[317] Paul Zucker, "Der Begriff der Zeit in der Architektur" in *Repertorium für Kunstwissenschaft*, Vol. 44, (1923/24) pp. 237-245. Quoted by Georgiadis, *ibid*, pp. 117-118

[318] Georgiadis, *Sigfried Giedion*, p. 118.

[319] László Moholy-Nagy, *Von Material zu Architektur* (München: Albert Langen Verlag, 1928). This book based on his educational experience and lectures at the Bauhaus between 1923 and 1928. It has been printed within the Bauhaus books (*Bauhausbücher*) series that consists of six books. A revised English edition, published under the title *The New Vision* (N.Y.: Brewer, Warren & Putman, Inc., 1930) and (N.Y.:W.W. Norton, 1938), and fourth revisited edition (Chicago: Paul Theobald; 1947) was published in 1947 under the title *The New Vision* and added "Abstract of an Artist" essay as an appendix. The book could have been published in 1947 due to Moholy-Nagy's death of leukemia in 1946: "*The New Vision* was completely revised and supplemented with an autobiographical essay in 1946, while a final statement of Moholy-Nagy's educational and aesthetic ideas, *Vision in Motion*, was published posthumously the following year. These two books, along with *Language of Vision* (1944) by Gyorgy Kepes, a close associate and member of Moholy-Nagy's faculty, are justly deemed classics of their time. With its calibrated asymmetrical layout, vivid imagery drawn from twentieth-century art, architecture, industrial design, and nature, and powerful use of photography as medium—both means and spirit—of the new technology, *Vision in Motion* infuses the exposition of Moholy-Nagy's didactics with the full power of the space-time imagination" in *Architecture Culture 1943-1968; A Documentary Anthology*, Joan Ockman, ed., (N.Y.: Rizzoli, 1993), p. 93.

[320] Moholy-Nagy, *Vision in Motion*, (5th ed., Chicago: Paul Theobald Publ., 1956 [1946]).

Moholy-Nagy and the author of *Language of Vision*,[321] who has scrutinized the laws of visual organization of spatial representation within the framework of Gestalt psychology, educator in Bauhaus-Chicago, György Kepes.

Walter Gropius, who has written the Preface for the 1947 printing of Moholy-Nagy's work titled *The New Vision and Abstract of an Artist*,[322] not only offers Moholy-Nagy's view where space can be comprehended by means of light as a new space conception and a new vision, but also depicts time as the fourth dimension with the effect of science and Cubist theory:

> "The abstract painters of our day have used their creative powers to establish a new counterpoint of space, **a new vision**. This is the core of their achievement. In the history of painting, the content of what is portrayed recedes before the more important problem of space. Consider how long it took for the painter to master the structure of perspective in pictures. Our artistic conception has now developed further. Today we are confronted by new problems, e.g., **the fourth dimension and the simultaneity of events, ideas foreign to former periods, but inherent in a modern conception of space**. The artist often senses a coming discovery before its advent. **Science now speaks of a fourth dimension in space, which means the introduction of an element of time into space.** Before the first World War, futurist and cubist artists were already attempting to introduce **movement into action, that is, the actual passing of time** into hitherto static pictures. For example, **Delaunay's well-known picture 'The Eiffel Tower' was intended to be a pictorial representation of the sensations of a passenger going up the Eiffel Tower in the elevator—of impressions which follow one another in space**."[323]

Aiming at an intellectual preparation[324] for a new space conception in painting, Moholy-Nagy suggests, a synthesis in every field to create the "man as a whole,"[325] as

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[321] György Kepes, *Language of Vision*, (8th enlarged ed., Chicago: Paul Theobald, 1951 [1944]).

[322] Gropius, Walter. "Preface" in *The New Vision*, László Moholy-Nagy, (New York: George Wittenborn, 1964 [1947]), pp. 5-6.

[323] Gropius, *ibid*, p. 6. Emphases are added. Even Georgiadis interprets Gropius's understanding of 'fourth dimension' in the Preface via the Bauhaus building: "Walter Gropius made a statement on the problem of the 'fourth dimension' in art, albeit more than twenty years after the construction of the Dessau Bauhaus Building." Georgiadis, *ibid*, p. 204, fn. 160.

[324] "One can never experience art through descriptions. Explanations and analyses can serve at best as intellectual preparation. They may, however, encourage one to make a direct contact with works of art" Moholy-Nagy, *The New Vision.*, p. 12.

also intended by his friend Giedion.[326] For integration as such, Moholy-Nagy offers the developments in field of painting as a model:

> "With a **more integrated approach to every event in life**, the neoplasticists, suprematists and constructivists have clearly understood their materials, and have tried to organize them. They have departed entirely from the traditional desire to mirror nature. They have tried to use the visual means of expression for the projection of order and harmony, without that distortion of the unique meaning of visual means which is inevitable if the means are obscured by associations with the objects of the external world. The work of renovation is a new evaluation of color, its optical energy, visual illusion and after-image, which are the means of **a new kinetic space-time rendering.**"[327]

On the other hand, related to his idea that the Cubists and post-Cubists have "changed the terms of the older visual representation of space," he reveals that they have "introduced a **new structure, through the organization of parallel planes**."[328] Similar to what Lissitzky has done previously, beyond rendering parallelism in between

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[325] Moholy-Nagy, *The New Vision*, p. 19. "It seems that our time will be able to create similar basic conditions, a similar atmosphere, and to produce a similar personality. Our time is one of transition, one of striving toward synthesis of all knowledge. A person with imagination can function now as an integrator." Moholy-Nagy, *The New Vision*, p. 18.

[326] The friendship of Giedion and Moholy-Nagy dates back to the periods prior to Giedion's first book *B.F.B.I.B.F.* in 1925, for Moholy-Nagy's book *Malerei, Photographie, Film* (München: Albert Langen Verlag, 1925) published as the eight of the series of Bauhaus books, Giedion has traveled with Moholy-Nagy around at Belle-Ile-en-Mer of France during the summer of 1924. Andreas Haus, *Moholy-Nagy: Photographs and Photograms*, trans. Fredric Samson (N.Y.: Pantheon, 1980), p. 64. Cited in *The Struggle for Utopia; Rodchenko, Lissitzky, Moholy-Nagy, 1917-1946*; Victor Margolin, (Chicago: Chicago Uni. Press, 1997), pp. 144-145, fn. 45.

[327] Moholy-Nagy, *The New Vision*, p. 38. Emphases are added.

[328] Moholy-Nagy, *The New Vision*, p. 33. Emphases are added. "Cubism related to space representation. Picasso's work is suitable for introduction at this point, because — especially at the beginning of the cubist period — the relation to elemental experience of materials, to tactile values, and to surface treatment is particularly graspable in his work. His intuitive comprehension of this field, on the visual side — though today already a matter of historical record — was full of the unexpected, the fresh, and the lively. What seemed in him only yesterday bizarre and senseless, now reveals itself as on ingenious paraphrase of our changing outlook on materials and space-time.

There is no doubt that the development of occidental painting con be approached from many points of view. If we choose one, e.g., the visual representation of space, i.e., the creation of spatial illusion on the picture-plane — then the cubists and post-cubists belong to the revolution which changed the terms of the older representation of space, terms which were based on different linear rhythms, color, size differences, surface divisions, linear and aerial perspectives, isometry, light and dark, etc. The cubists introduced a new structure, through the organization of parallel planes." Moholy-Nagy, *The New Vision*, p. 33.

motion picture and space-time due to its temporal and simultaneous structure, he converts this cinematic layout into an explanation model for Cubism and Futurism:

> "Cubism utilized photography in its study of surface values. Photography, in turn, awoke to the possibilities of its own province after a decade of cubist experiment. This applies also to **the use of simultaneous views in motion pictures, foreshadowed in cubism. Simultaneous action was obtained, in cubism, by presenting at the same time the object from above, from the side, and in cross-section, a juxtaposition and superimposition of these views, in contrast to the postposition of cinema projection**.
>
> Futurism also took up problems, essentially of a cinematic kind, long before the motion picture began to. We might characterize **futurism as a superimposition of the object in a sequence of linear movement, while cubism is the rendering of the objects as if they were rotated in space**.
>
> (…) In the continuation of this work we undoubtedly must come to **the manipulation of moving, refracted light (color); we must 'paint' with flowing, oscillating, prismatic fight, in lieu of pigments**. This will allow us a better approach to **the new conception of space-time**."[329]

Owing to Moholy-Nagy's understanding of "the space concept by means of light" and "the light-space-time continuity in the synthesis of motion,"[330] the unmaterialistic movement of light is presented as the fourth dimension, i.e., time:

> "…In the lightening of masses, the next stop beyond the equipoise is kinetic equipoise, in which the volume relationships are virtual ones, i.e., resulting mainly from the actual movement of the contours, rings, rods, and other objects. Here the material is employed as a vehicle of motion. To the three dimensions of volume, a fourth — movement — (in other words, *time* is added)."[331]

Referring to light's virtual volume he called 'time-spatial energy'[332] as lightening the material, Moholy-Nagy defines this development as "from mass to motion" in context

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[329] Moholy-Nagy, *The New Vision*, p. 40. Emphases are added.

[330] William C. Wees, *Light Moving in Time; Studies in the Visual Aesthetics of Avant-Garde Film*, (Oxford: California Uni. Press, 1992), p. 13.

[331] Moholy-Nagy, *The New Vision*, p. 47. Italic is original.

[332] "Light. In this connection, light —as time-spatial energy and its projection— is an outstanding aid in propelling kinetic sculpture, and in attaining virtual volume." Moholy-Nagy, *The New Vision*, p. 50.

of sculpture.[333] He considers the fireworks, which he adopts as an example that suits the spatial and temporal structure of kinetic sculpture and dynamism, as exemplifying the "simultaneity" and "interpenetration of time and space," the objective of the Futurists and constructivists both.[334]

Following the emigration of Bauhaus school to the United States of America in 1938 and the re-establishment in Chicago, Moholy-Nagy becomes the director of the new school. The work titled *Vision in Motion*, which he has written as a result of the education experiences in "New Bauhaus," prior to his death in 1946, has been regarded as Moholy-Nagy's "artistic-pedagogical testament."[335] In this book of his, Moholy-Nagy approaches the concepts of both time and space-time much differently from the content of his book *The New Vision* and he reconceptualizes his views in a manner

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[333] "Thus a similar quest for expression by subduing or lightening the material is to be found . . .
in sculpture: from mass to motion;
in painting: from colored pigment to light (display of colored light);
in music: from instrumental tones to electronic purity (ether wave music);
in poetry: from syntax and grammar to relations of single words;
in architecture: from restricted closed spaces to free fluctuation of forces." Moholy-Nagy, *The New Vision*, p. 48. Emphases are original.

[334] Moholy-Nagy, adopts an understanding similar to Lissitzky's perception of temporal fourth dimension as physical motion: "Fireworks are play and science at the same time. They also give evidence that a precalculation of direction, movement, color, etc., may produce a sensible augmentation of the effects. However, we are today still afraid or 'deliberateness' in o 'work of art' — and to be sure the intellectual scope and effect of 'art,' in the judgment of the 'expert,' would have to be on an incomparably higher plane than mere 'play'!

The photograph of a firework, usually *a* **time exposure**, registers **the sequence of the exploding firecrackers on the same picture plane** thus showing **spatial 'simultaneity'** of their paths: **an interpenetration of time and space**.

(…) The history of kinetic sculpture. The history of kinetic sculpture begins far back in ancient history, with the very first Greek clockwork automata. As a step inward kinetic sculpture in our own time, one may mention certain toys, advertising signs, fountains, fireworks, and the like. These often contain interesting suggestions for experiments. The futurists came forward as conscious propagandists of the dynamic as a principle of artistic creation. Boccioni presented the first 'dynamic' pieces of sculpture in his book 'Pittura, scultura futurista (dinamismo plastico).' In 1912 he wrote:

'The futurists broke down the concept of repose — the static — and put forward that of motion — the dynamic. They showed a new grasp of space by bringing into contrast the inner and the outer.'

Written as a challenge to the aims of the Russian constructivists, the 'Realist Manifesto' of Gabo and Pevsner, of Moscow, was published in 1920 ('i 10,' no. 7, Amsterdam, 1927). Here are excerpts from it;

'Space and time are the two exclusive forms for fulfillment of life, and therefore art must be guided by these two basic forms, if it is to encompass true life. (…) **To incorporate our experience of the world in the forms of space and time**; this is the single goal of our creative art.'" Moholy-Nagy, *The New Vision*, p. 49. Emphases are added.

[335] "'Vision in Motion' ist Moholys künstlerische-pädagogisches Testament. Es wurde, vor allem in Amerika, zu einem Standardwerk der Kunstliteratur." Cited in *Bauhaus, 1919-1933 Weimar, Dessau, Berlin und die Nachfolge in Chicago Seit 1937*, Hans M. Wingler, (3rd ed., Bramsche: Verlag Gebr. Rausch & Co., 1975 [1962]), p. 208.

much different from Giedion's book *Space, Time and Architecture*.[336] Although Moholy-Nagy emphasizes that there exists no relationship between space-time and the Relativity Theory, he continues on with his reception of time as the fourth dimension:

> "Since 'space-time' may be a misleading term, it especially has to be emphasized that space-time problems in the arts are not necessarily based upon Einstein's theory of relativity*. This is not meant to discount the relevance of his theory to the arts. But artists and laymen seldom have the mathematical knowledge to visualize in scientific formulae the analogies to their own work. Einstein's terminology of 'space-time' and 'relativity' has been absorbed by our daily language. Whether we use the terms 'space-time'; 'motion and speed', or 'vision in motion', rightly or wrongly, they designate a new dynamic and kinetic existence freed from the static, fixed framework of the past. Space-time is not only a matter of natural science or of esthetic and emotional interest. It deeply modifies the character of social ends, even beyond the sense that pure science may lead to a better application of our resources."[337]

On the other hand, resembling those theories on space in Geography and later in Economics during the 1980s and 1990s, he defines the time conception within such a similar content that could avail for the initiation of "space annihilating by time":[338]

> "(…) the time it took to bridge the distance in moving goods from the place of production to the place of consumption. Time (speed) became the most important competitive factor in production, transportation and sale. With the introduction of accelerated time, a new kinetic dimension was added to the static existence. (…) Another example: the submarine finds its target by radio ware sent out and reflected back, indicating distance by time.

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[336] "The book by Dr. S. Giedion: 'Space, Time, and Architecture' (Harvard University Press, 1942) will help greatly in understanding this concept, though I am approaching the problem not so much from the point of view of architectural structure as from that of social implications." In Moholy-Nagy, *Vision in Motion*, p. 266, unnumbered footnote.

[337] Moholy-Nagy, *Vision in Motion*, p. 266. *In one of the three unnumbered footnotes, Moholy-Nagy has interpreted the Time conception in the Einstein's Relativity Theory as the fourth dimension: "The relativity theory states: The speed of light is constant; it is the absolute speed in the universe. However, motion of objects can only be measured relative to another motion. Time is a coordinate of space. It is the 'fourth dimension'—a physical measurement. Electricity and gravity combined account for all solid matter and matter and energy are interchangeable terms. This latter thesis led to the forecast of Einstein that the atom can be split thereby releasing immense energies."

[338] David Harvey, *The Condition Postmodern; An Enquiry into the Origins of Cultural Change*, (London: Blackwell Pub., 1989); Anthony Giddens, *The Consequences of Modernity*, (London: Blackwell Pub., 1992); Manuel Castells, *The Rise of Network Society*, (London: Blackwell Pub., 1999), and as for the recent years in field of economy, Saskia Sassen, *Globalization and its Discontents*, (N.Y.: New Press, 1998)...etc.

> The 'instantaneity' of this measurement of space with a time factor makes it totally different from the way in which one used to measure, say, the distance from New York to Chicago as 'ten days.'"[339]

As for Giedion, with his therapeuric synthesis model for dynamics of Modernity, which do not reconciliate with one another, he formulates the concept of Space-time as a holistic response to the modernization process. This evocative structure of Giedion's Space-time concept that gets increasingly ambiguous to the extent that it encompasses all dynamics has been explicitly expressed by Moholy-Nagy as follows:

> "Space or space-time experience is not merely the privilege of exceptionally talented persons. (…) There is, for example, the hope that it will help in grasping future problems and vistas, enabling us to see everything in relationship, that it will furnish us with the right concept of cooperation and defense against aggression, where again space and time are inseparably intertwined. (…) Space-time stands for many things: relativity of motion and its measurement, integration, simultaneous grasp of the inside and outside, revelation of the structure instead of the facade. It also stands for a new vision concerning materials, energies, tensions, and their social implications.
>
> This conception is still unpredictable in its consequences for the improvement of the affairs of mankind though the artist as well as the designer already experiment with it on a new level of consciousness. The designer has to think in terms of integrated processes of materials and production, sales, distribution, financing and advertising; the contemporary artist consciously or intuitively tries to express the substance of his specialized field as the result of forces in space and time and to integrate it with the social reality. He prepares a new and creative vision for the masses, and with it a new orientation for a healthier life plan."[340]

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[339] Moholy-Nagy, *Vision in Motion*, p. 266.

[340] Moholy-Nagy, *Vision in Motion*, pp. 266-268. Emphasizing "a new level of consciousness" and Freud's subconsciousness, Moholy-Nagy regards this as the new source of creativity and advocates for the Unified Man mythos that subconsciousness should also be taken into consideration and get integrated. As for the perception of Subconsciousness as Unconscious, in his book *Language of Vision*, Kepes cites from Carlyle's writing of 1831: "The artificial is the conscious mechanical; the natural is the unconscious, dynamical. Unconsciousness is the sign of creation; consciousness at the best that of manufacture" and continues on with the expression of his own point of view: "Contemporary artists, revolting against the fetters of static concept, throw away all conscious control. Artistic endeavour was reduced, only to a sheer assistance of chance happenings." Kepes, *ibid*, p. 194.

"Scientific advance and advancing optical mastery of reality again went along converging avenues. The process of understanding physical space was repeated in psychological space. In science, **the Euclidian geometry was recognized as only the first approximation of space and in painting the fixed perspective as an insufficient rendering of spatial experiences**. In psychology, the conscious region was understood as only a limited complex of psychological events, and its representation in art as only the first step of its creative expression. And as the pioneer scientists found **a 'more real' picturing of the physical space by fusing space and time into one indivisible unity**, and pioneer

Two years before *Vision in Motion* by Moholy-Nagy, in his book *Language of Vision* written in 1944 György Kepes proposes a new visual language to read and grasp visual dynamics of modernity as "space-time relationship":

> "The mastery of nature is intimately connected with the mastery of space; this is visual orientation. Each new visual environment demands a reorientation, a new way of measuring. Seeing spatial relationships on a flat land is a different experience from seeing them in a mountainous region, inhere one form intercepts the other. To orient oneself in walking requires a different spatial measurement than is required in riding in a motor-car or in an aeroplane. To grasp spatial relationships and orient oneself in a metropolis of today, among the intricate dimensions of streets, subways, elevated, and skyscrapers, requires a new way of seeing. Widening horizons, and the new dimensions of the visual environment necessitate new idioms of spatial measurement and communication of space. The visual image of today must come to terms with all this: it must evolve a language of space which is adjusted to the new standards of experience. This new language can and will enable the human sensibility to perceive **space-time relationships** never recognized before.
>
> (…)Today, creative artists have three tasks to accomplish if the language of vision is to be made a potent factor in reshaping our lives. They must learn and apply the laws of plastic organization needed for the re-establishing of the created image on a healthy basis. They must make terms with contemporary spatial experiences to learn to utilize the visual representation of **contemporary space-time events**. Finally, they must

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painters a 'more real' representation by welding objects and background into a dynamic plastic unity by interpenetration of color planes and lines, so the pioneers of the psychological space searched for 'a more real world than the real behind the real,' by fusion of the conscious and subconscious experiences; in Andre Breton's words: 'the future resolution of the two states (in appearance contradictory), dream and reality, into a sort of absolute reality.' **The object that had been analyzed by the cubist painters in the background of the space-time field, was now being analyzed by the surrealist painters in the field of the subconscious associations**. 'It is essentially upon the objects that surrealism has thrown most light in recent years. Only the very close examination of the many recent speculations to which the object has publicly given rise (the oneric object, the object functioning-symbolically, the phantom object, the discovered object, etc.), can give one a proper grasp of the experiments that surrealism is engaged in now,' said Andre Breton in 'What Is Surrealism.'

The subconscious, manifested in dreams and free associations, has another logic than that of space-time derived from empirical facts, and the new picture-image, in a sovereign automatism, brought together representation of objects unrelated in the everyday experiences. But the importance of one or another object in the frustrated subconscious sphere dictated its size and position on the picture surface. The structure of the associative content dominated the picture organization. Consequently, the plastic order was again restricted." Kepes, *ibid*, p. 210. Emphases are added.

On the other hand, in *S.T.A*, Giedion similarly implies consciousness as in contrast to creativity and due to the parallelism he has established in between ratio/thought/subject, he uses his reception of unconsciousness as being devoid of any subject, sometimes as the "will/power/determination" conflict, sometimes allusively in order to describe the path pursued by the "New Tradition" as to allude to fate: "Modern painters have enlarged our visual experience by working with relations between objects which he had never taken cognizance of in our ordinary, **half-automatic seeing**." Giedion, *ibid*, p. 705. Emphases are added.

> release the reserves of creative imagination and organize them into dynamic idioms, that is, develop a contemporary dynamic iconography."[341]

In Kepes's Gestaltist visual perception model, owing to dynamism of Modernity, the motion picture[342] providing for the synchronization of the temporal and spatial structure of the vision, optical innovations[343] like X-Ray, new representation techniques as collage and photomontage[344] and the "education of the eye"[345] providing for "plastic experience,"[346] the space-time events are visually assimilated by the eye.[347] However,

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[341] Kepes, *ibid*, p. 14. Emphases are added.

[342] "The invention of the motion picture opened the way to a hitherto undreamed scope and flexibility of rhythmic organization. The new possibilities of the synchronization of the temporal and spatial structure of the vision are, however, still barely touched upon. From the few pioneers who tackled the problems. Viking Eggeling and Hans Richter made the first and most important practical and theoretical clarifications. Eggeling pointed to the very core of all visual organization when he wrote: 'What should be grasped and given form are things in flux.'" Kepes, *ibid*, p. 58.

[343] "Innovations in representational idioms caused important progress toward the optical mastery of contemporary space time experiences. But visual communication can only be efficient if it submits itself to the new landscape and the new psychology of contemporary man. And simultaneously with the mastery of the new wider space, visual communication was forced to make some significant adaptations to the contemporary scene." Kepes, *ibid*, p. 129. Here, the hyphenation between space and time seems to have been forgotten in printing.

[344] "There were many convergent directions in these attempts **to bind the liberated meaning-facets into a new dynamic whole**. Painting enriched with new idioms; **collage and photomontage**, contributed toward the structural understanding of the relationship of representational signs, and cleared the way for this redirection. The motion picture made the first thorough analysis of the structural connection of representational images in **actual time sequence**. Advertising art pioneered in testing representational images in combination with pure plastic units and verbal elements." Kepes, *ibid*, p. 207. Emphases are added.

[345] "As the eye is the agent in conveying impressions to the mind, the achieving of visual communication requires a fundamental knowledge of the means of visual expression. Development of this knowledge will generate a genuine 'language of the eye' whose 'sentences' are the created images and whose elements are the basic plastic signs, line, plane, halftone gradation, color, etc." György Kepes, "Education of the Eye," *More Business*, Vol. 3, No: 11 (Nov. 1938), in Wingler, *ibid*, p. 203.

[346] "The goal is a visual representation in which the most advanced knowledge of space is synchronized with the nature of the plastic experience. **Space-time is order, and the image is an 'orderer.'** Only the integration of these two aspects of order can make **the language of vision** what it should be: **a vital weapon of progress**." Kepes, *ibid*, p. 68. Emphases are added.

[347] "Man is a dynamic being struggling individually and socially for survival. To survive he must orient himself to his surroundings. He must measure and order the visual impacts of his environment to correspond with nature. He must communicate his findings to his fellow men for the mutual reinforcement of their actions. He asserts himself in the material world by means of his sensory equipment as well as his thinking process. Thus **the control of nature includes the domestication of nature through the eye, the visual assimilation of space-time events**." Kepes, *ibid*, p. 66. Emphases are added.

Kepes is aware of the fact that, apart from the dynamic space-time events, the act of perception also contains the time factor.[348]

3.3 "Space-Time" Myth as a Conveyor of Einstein's General Theory of Relativity into Architecture

In context of the unification ideal of art and all fields of life, which György Kepes, just like Giedion, has seen as a response to modernization process, he thinks that space-time events of the physical world should be transferred to art.[349] In just the same way as

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[348] "The use of this geometrical relationship was re-introduced by the Renaissance painters as the main device for representing spatial relationships. Their artistic goal was the optical scientific mastery of nature. Conditioned by the aspirations and outlook of the Renaissance, they sought to achieve this step by step by focusing always on one aspect, on one cut-out sector, of the unbounded wealth of surrounding nature. Like the anatomist—another pioneer of the same spirit, who made his conquest of knowledge by eliminating the living, moving aspects of the body—the artist—anatomist of the visual image—eliminated the flux of the innumerable visual relationships that the visible world has for the spectator. He froze the living, fluctuating wealth of the visual field into a static geometrical system, **eliminating the time-element** always present in the experiencing of space, and thus destroying the dynamic relationships in the experience of the spectator." Kepes, *ibid*, p. 86. Emphases are added.

"Since the discovery of perspective, painters began to represent the optical image of light moulded and bent by the various mediums of the environment. They developed progressive skill first in delineating the three-dimensional sculptural appearance of the object-world, later in mastering light and shadow as space-articulating forces, and finally in representing space as luminous by dissolving solidity into light substance.

In their search for optical fidelity of representation painters were forced to condense more and more **the time of observation**. They had reduced it almost to infinity. **Visual experience, however, is a space-time experience. A distance—an extension in space—has meaning only if a certain time is needed to cover it**. The very existence of matter is inseparable from time. It is impossible to conceive a material object as existing instantaneously. The more accurate became the representation of the play of light on the object, therefore, the farther representation departed from a true visual expression of spatial extension. It could never achieve an intimate welding of space-time experience." Kepes, *ibid*, p. 143. Emphases are added.

[349] "As the **Euclidean geometry** was but a first approximation in the **knowledge of spatial forms**, reflecting only a certain limited complex of spatial properties, the traditional forms of visual representation were but the first approximation in sensing the spatial reality.

In the last hundred years technological practice has introduced a new, complex visual environment. **The contemporary painter's task is to find the way of ordering and measuring this new world**. This historical challenge calls him to assimilate the new findings and to develop a new sensibility, a new standard of vision that can release the nervous system to a broader scale of orientation.

Visual representation operates by means of a sign system based upon a correspondence between the sensory stimulations and the visible structure of physical world. **Space-time events of the physical world must be translated into the relationships of color surfaces on the picture-plane**. Man has gradually learned **to order certain visible relationships of space-time events; that is, of extent, of depth, and of movement**. The historical development of representation shows a gradual conquest of these optical relationships in the terms of the two-dimensional picture surface." Kepes, *ibid*, p. 67. Emphases are added.

Alexander Dorner has indicated in his book *The Way Beyond 'Art'*[350] in 1947, a similar claim where art should as well attain a dynamic structure has been scientifically established by Kepes. In Minkowski's *Principles of Relativity*, Kepes lays stress on the kinetic essence of Matter with the claim that art should gain a dynamic character in context of this universal reality.[351] Nevertheless, due to his interest in dynamism, Kepes not only sets up similarity between the Futurists's approach and Einstein's Relativity, [352] but also perceives the concept of time as a mixture of Non-Euclidean geometry, *n*-dimension, Minkowski's and Einstein's theories:

> "In their search to find an optical projection which conformed to the dynamic reality as they sensed and comprehended it, **painters unconsciously repeated the path traced by advancing physical science**.
>
> Their first step was to represent on the same picture-plane a sequence of positions of a moving body. This was basically nothing but a cataloging of stationary spatial locations. The idea corresponded to **the concept of classical physics, which describes objects existing in three-dimensional space and changing locations in sequence of absolute time**. The concept of the object was kept. The sequence of events frozen on the picture-plane only amplified the contradiction between the dynamic reality and the fixity of the three-dimensional object-concept.
>
> Their second step was to fuse **the different positions of the object by filling out the pathway of their movement**. Objects were no longer considered as isolated, fixed units. **Potential and kinetic energies were included as optical characteristics**. The object was regarded to be either in active motion, indicating its direction by 'lines of force,' or in potential motion, pregnant with lines of force, which pointed the direction in which the object would go if freed. The painters thus sought to picture the mechanical point of view of nature, devising optical equivalents for mass,

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[350] Alexander Dorner, *The Way Beyond 'Art'*, (rev. ed., New York: New York Uni. Pr., 1958 [1947])

[351] "**Matter**, the physical basis of all spatial experience and thus the source material of representation, **is kinetic in its very essence**. From atomic happenings to cosmic actions, all elements in nature are in perpetual interaction—in a flux complete. We are living a mobile existence. The earth is rotating; the sun is moving; trees are growing; flowers are opening and closing; clouds are merging, dissolving, coming and going; light and shadow are hunting each other in an indefatigable play; forms are appearing and disappearing; and man, who is experiencing all this, is himself subject to all kinetic change. The perception of physical reality cannot escape the quality of movement. The very understanding of spatial facts, the meaning of extension or distances, involves **the notion of time—a fusion of space-time which is movement**. 'Nobody has ever noticed a place except at a time or a time except at a place,' said Minkowsky in his *Principles of Relativity*." Kepes, *ibid*, p. 170.

[352] For a recent work that sets up a similar relationship to explain the dynamic structure of Modernity, please refer to Sanford Kwinter, "La Città Nuova: Modernity and Continuity" *Zone*, nos. 1-2 (1986) and reprinted in *Architecture Theory Since 1968*, Michael Hays, ed., (Cambridge, Mass.: The M.I.T. Press, 1998), and also Kwinter, *Architectures of Time*, esp. chapter 3: "Physical Theory and Modernity: Einstein, Boccioni, Sant'Elia", pp. 53-100.

force, and gravitation. This innovation signified important progress, because the indicated lines of forces could function as the plastic forces of two-dimensional picture-plane.

The third step was guided by desire to integrate the increasingly complicated maze of **movement-directions**. The chaotic jumble of **centrifugal line of forces needed to be unified**. Simultaneous representation of the numerous visible aspects composing an event was the new representational technique here introduced. **The cubist space analysis was synchronized with the line of forces. The body of the moving object, the path of its movement and its background were portrayed in the same picture by fusing all these elements in a kinetic pattern**. The romantic language of the futurist manifestos describes the method thus: 'The simultaneosity of soul in a work of art; such is the exciting aim of our art. In painting a figure on a balcony, seen from within doors, we shall not confine the view to what can be seen through the frame of the window; we shall give the sum total of the visual sensation of the street, the double row of houses extending right and left the flowered balconies, etc. (...) in other words, a simultaneity of environment and therefore a dismemberment and dislocation of objects, a scattering and confusion of details independent of one and another and without reference to accepted logic,' said Marinetti. **This concept shows a great similarity to the idea expressed by Einstein, expounding as a physicist the space-time interpretation of the general theory of relativity.** 'The world of events can be described by a static picture thrown onto the background of **the four dimensional time-space continuum**. In the past science described motion as happenings in time, general theory of relativity interprets events existing in space-time.'"[353]

Two architects have played a crucial role in providing for Einstein's Relativity theory to occupy a place and become influential on the architectural agenda in the first quarter of the 20th century in Germany: Bruno Taut and Erich Mendelsohn.

Bruno Taut's Glashaus Pavilion, which has been realized for the *Deutsche Werkbund* Exhibition held in Cologne in 1914, is one of the early examples for the modern subject-object relationship with its facetness of glazed crystal-shaped roof and the continuous circulation diagram that breaks the perspective inside. The perception of floating vision produced by the help of rounded circulation layout by the stairs and dynamics of the cascade waterfall placed inside of the building, constitutes an early example for translation of space-time philosophy into architecture as it adds a temporal attribute to the *Gestaltung* of the building[354] (Figures 3.14, 3.15 and 3.16). Owing to his

[353] Kepes, *ibid*, p. 178. Emphases are added.

[354] For the study that deciphers Bruno Taut's Glasshaus as space-time relationship, See, *Kristallisationen, Splitterungen; Bruno Tauts Glashaus*, ed. Angelika Thiekötter, (Basel: Birkhäuser Verlag, 1993)

interest in the structure of light and crystal,[355] Spectralanalysis, Astrophysics and Astronomy, Taut was concerned with Einstein's Relativity Theory in 1919, but this theory has never occupied a direct place in either architecture or discourse of Taut (Figures 3.17):

> "That means each time one and the same motive changed its natur, its form and meaning in relation to different space-time relation systems. Taut formulated here in structural form (Gestalt) a principal that the indicated after years: 'We want to watch only the mechanical in influence on the universe. The Copernican system or opposite? The earth turns around the sun for those, who 'stand' on the sun, as the sun turns around the earth, for those who 'stand' on earth. For a point of view, other than both, the situation is different again, and everything is for the astronomical calculations correct. As a result; not the easiest and current mechanical method of thinking is on the universe transferable, like the gravitation and all the others. It's the same, for all things in the world (Relativity).' This definition goes back to 1919, when 'Relativity excitement' of Einstein's Theory approved after experiments, just began. If Taut engaged or not with Einstein before, is unclear. From a stronger interest appear, what he built."[356]

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[355] About Taut's cosmic structure and the structure of stars, he is known to have read Dr. Wilhelm Meyer's <u>*Die Lebensgeschichte der Gestirne in Briefen an eine Freundin; Eine populäre Astronomie der Fixsterne*</u> written in 1898. Cited in Tiekötter, *ibid*, pp. 72-75.

[356] "Das heißt, jeweils ein und dasselbe Motiv veränderte sein Wesen, seine Gestalt und Bedeutung in Relation zu verschiedenen raum-zeitlichen Bezugssystemen. Taut formulierte hier in baulicher Gestalt ein Prinzip, das er Jahre später auch benannte: '*Wir wollen nur das Mechanische betrachten in der Auswirkung auf das All. Kopernikanisches System oder umgekehrt? Die Erde dreht sich um die Sonne für den, der auf der Sonne 'steht', wie die Sonne sich um die Erde dreht für den, der auf der Erde steht. Für einen 'Standpunkt' außerhalb beider ist die Sache wieder anders und alles ist für astronomische Berechnungen richtig. Der Schluß: nicht die einfachste und geläufige mechanische Denkweise ist auf das All übertragbar, ebensowenig wie die Schwerkraft und alles andere. Genauso verhält es sich bei allen Dingen auf der Welt (Relativität).*' † Diese Formulierung stammt aus dem Jahr 1919, als der '*Relativitätsrummel*' um Einsteins Theorie, ausgelöst durch den experimentellen Nachweis ihrer Richtigkeit, gerade begann.* Taut sich schon vorher mit Einstein befaßt hat, bleibt im Dunkeln. Von größerem Interesse erscheint, was er gebaut hat." Tiekötter, *ibid*, p. 58. Freely translated by the author. Tiekötter quates from; † Bruno Taut; "Mein Weltbild, Brief der gläsernen Kette vom 19.10.1920" in <u>*Das Hohe Ufer*</u>, (Hannover), (Feb. 1920), pp. 152-158 and *Joachim Krausse, "Einsteins Weltbild und die Architektur", <u>*ARCH +*</u> no. 116, (March 1993), p. 34.

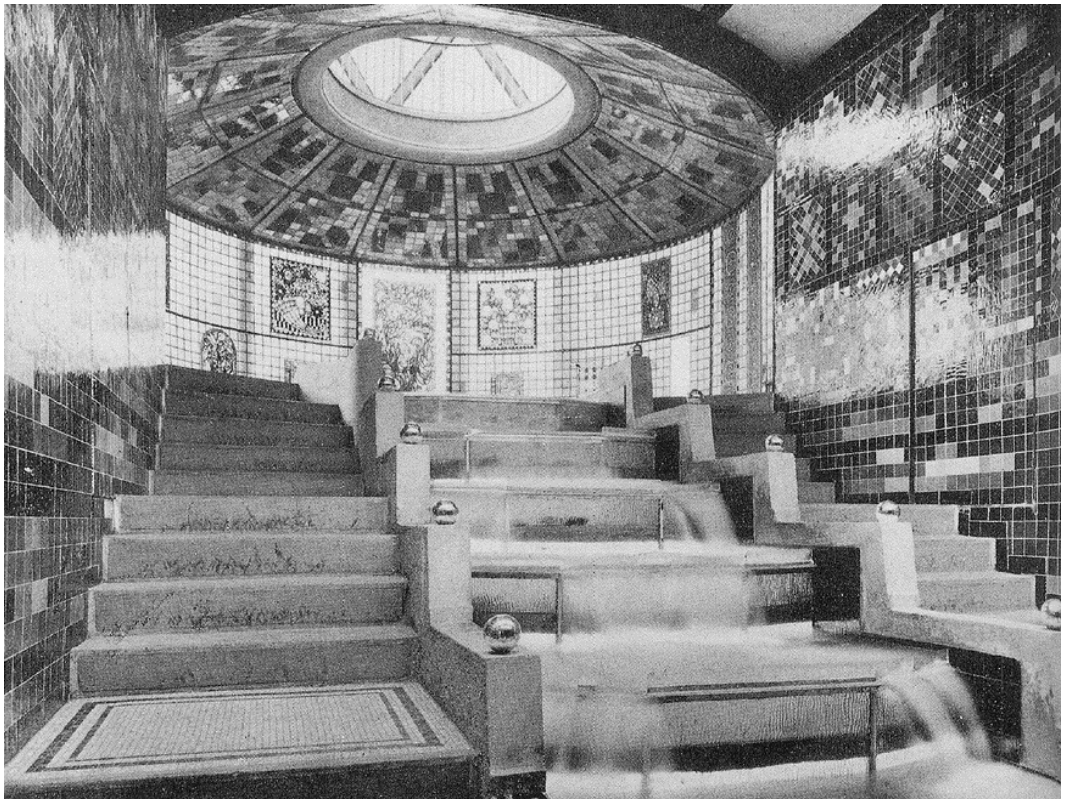
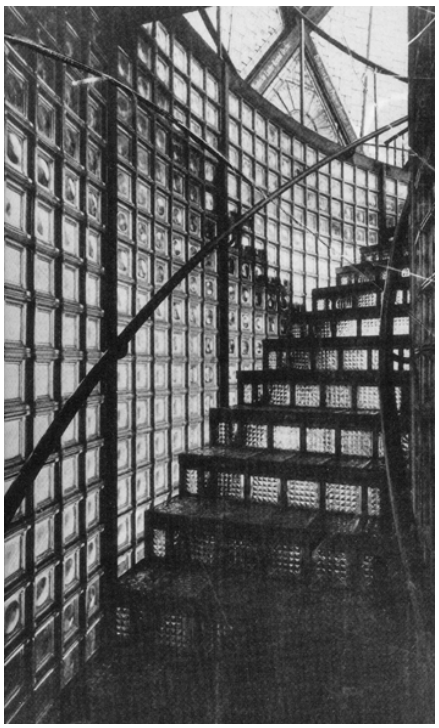
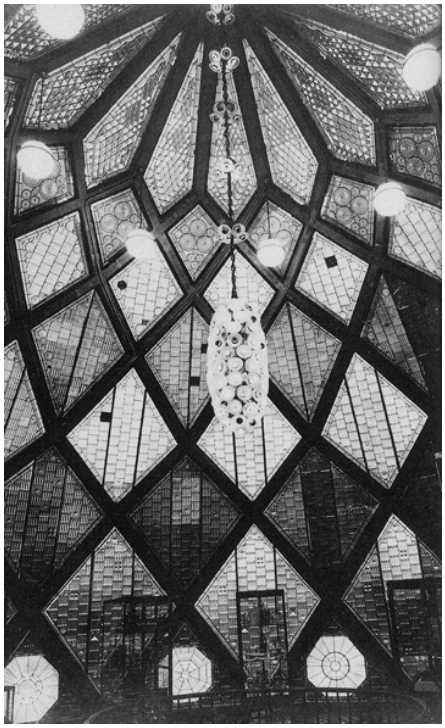


Figure 3.14 Dramaturgic and dynamic effects of cascaded fall in Bruno Taut's *Glashaus* in the Werkbund Exhibition in Cologne in 1914. From *Kristallisationen, Splitterungen; Bruno Tauts Glashaus*, Angelika Thiekötter, ed., (1993), p. 38.





Figures 3.15 and 3.16 Opaque glass surface of the rotating staircase and crystallized glass dome in Bruno Taut's *Glashaus* in Werkbund Exhibition in Cologne in 1914. From *Kristallisationen, Splitterungen; Bruno Tauts Glashaus*, Angelika Thiekötter, ed., (1993), pp. 3, 44.

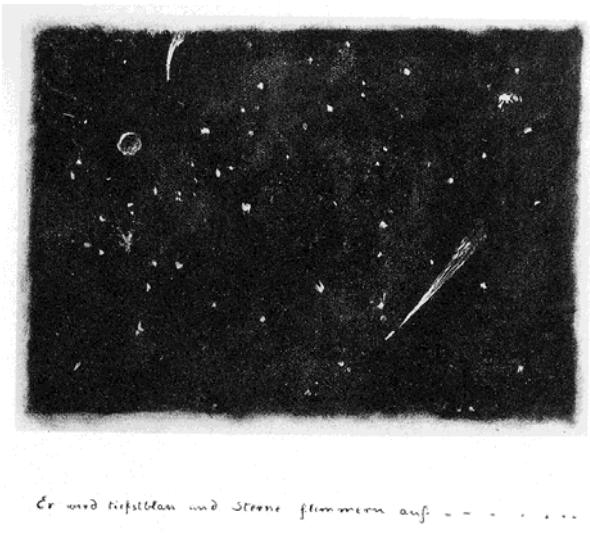


Figure 3.17 Bruno Taut's sketch of the ether. Published in *Weltbaumeister*, Bruno Taut (1920). From *Kristallisationen, Splitterungen; Bruno Tauts Glashaus*, Angelika Thiekötter, ed., (1993), p. 60. Taut's accompanying text reads, "Er wird tiefstblau und Sterne flimmern auf..." (It will be deepblue and stars shining on...).

Apart from that, the earliest one of the relationships founded between Einstein's General Theory of Relativity and the architectural space is embodied in Erich Mendelsohn's Einstein Tower Observatory in Postdam. However, akin to Taut, there appears to be no concern traced for the translation of Relativity Theory into either architecture or discourse in any work of Mendelsohn as well.

In 1913, Einstein was rebutting Newton's connection between conceptions of traditional space, time and matter accepted for the last 200 years by a preliminary version of his general theory of relativity, a new theory of gravitation. Since the astrophysical measurements (astrophysical measurements could provide proof for the extremely small effects of relativity), required for transforming Einstein's hypothesis into theory (to demonstrate empirically the correctness of the new theory) would only be realized by the data obtained from the observatory, there exists no information that Mendelsohn has been influenced by this theory yet in the form of a hypothesis. As can be derived from the first observatory sketches of Mendelsohn, because of the similarity between the Observatory's underground and ground level spatial configuration and the technical requirements and the path to be followed by the light, he has taken the submarine boat and its periscope diagram as a model for the optic formulation of the Observatory[357] (Figures 3.18, 3.19 and 3.20). As also indicated by one of the first members of staff of the Observatory Harald von Klüber,[358] more than Mendelsohn

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[357] Joachim Krausse, Dietmar Ropohl, Walter Scheiffele, *From the Great Refractor to the Einstein Tower; An Exhibition on the Occasion of the 70th Anniversary of the Einstein Tower in Postdam*, (Gießen: Anabas Verlag Günter Kämpf, 1996), p.19.

[358] "…I used to point out with hopeful emphasis that much of the surrounding buildings were constructed and styled at the end of the last century in the cool, sober Prussian style with the red bricks of the Mark Brandenburg. **They well fitted to the classical Euclidean concept of mathematics and to the atomic structure of matter, consisting of discrete units, as one understood it at time of the outgoing century. Whereas the new style of Mendelsohn's reflected very well the aspects of quite modern technology, mathematics and physics with their complicated, nevertheless highly esthetic and attractive ideas, with transcendent functions, complicated swinging forms and elegant curvatures.** This contrasted to the much simpler, orthogonal Euclidean system of older days and it reflected in some way that just now starting break-down of the simpler atomic models in favour of the new more transcendental conception of a smooth change–over between matter and energy as first pointed out by Einstein. **By myself I thought this all to be probably a fair nonsense and that the architect might in reality never have contemplated his creation under such parallels…** Today, after decades, and after having seen myself so many more different architectures all over the world, I am no more so sure that my comments at that time were quite so wrong as I thought them to be. **Certainly, an artist or a first class architect, as Mr. Mendelsohn was, does not need to think or even know much and in detail about rationalistic relationship or justifications.** He probably feels and experiences the idea and the style and the trend of his time on an even better and certainly more sensitive level than rationalistic analysis could do." "Letter from Harald von Klüber to Louise Mendelsohn, 1970", in Krausse, et.al., *ibid*, p. 38.

himself, the employees of the building and the professor of astronomy and collobrator of Professor Albert Einstein, Prof. E. Finlay-Freundlich,[359] reckon the relation to be established between the building and the Relativity theory is dependent upon the view that it is seen to be translated into architecture, but with the illusion that theory can be adapted into everything in context of its universal reality.[360] As can be depicted from words of Harald von Klüber, whilst the curved wall surfaces are regarded as an expression of non-Euclidean geometry, a mentality that equates this with the Relavitity theory is also in question.

Different from those analogies established by architectural historians between architecture and the Relativity Theory, Prof. Einstein has made three statements at three different dates — on December 1924 when the building was opened and in 1941 when Giedion's book *S.T.A.* was released and in May 1946 — revealing that the Relativity Theory has connections with neither shaping of the Einstein Tower nor Cubism:

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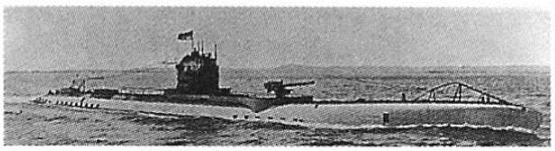
[359] "Erich was 31 when he returned from the war and opened an office in Berlin. He started to work on the drawings for the Einstein Tower. This project was discussed before the war in 1914 between Prof. Erwin Finley-Freundlich, who then was working as an astrophysicist at the observatory in Neu-Babelsberg near Berlin and was Einstein's assistant from 1917 to 1921 at the Kaiser Wilhelm Institute of Physics in Berlin. Prof. Freundlich told us at that time a very interesting story, so indicative of Einstein's modesty. Einstein had asked Freundlich to type the manuscript of the Theory for him. (…) It was Prof. Freundlich's idea to build a tower telescope to start 'solar-physical' research with exact experimental means. The test of the general deviation of all the sun's spectral lines, predicted by the Theory of Relativity, demanded such experimental auxiliary means. For this purpose Prof. Freundlich conceived the new idea of combining a tower-telescope with a fully equipped physics laboratory." Bruno Zevi, *Mendelsohn; The Complete Works*, trans. Lucinda Byatt (Basel: Birkhäuser Verlag; 1999), p. 58.

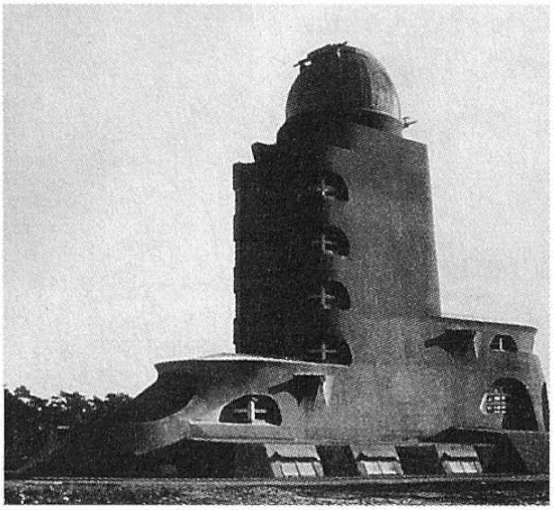
[360] "The building manifests an entirely new invention for an Astrophysical Research Institute, a beginning of a new era which started with Einstein's Theory of Relativity and with a new era of organic structure in architecture, possible only in the new materials of steel and concrete." Zevi has quoted from Freundlich's booklet, Erwin Finlay-Freundlich, *Das Turmteleskop der Einstein Stiftung*, (Berlin: Verlag von Julius Springer, 1927), in Zevi, *ibid*, p. 59.

"The astrophysicist Erwin F. Freundlich is the least well-known of the prominent protagonists of the Einstein Tower: unlucky as a scientist, but extremely successful as organizer of the Einstein Tower project. He was the first astronomer to make contact with Einstein and to make to the latter's general theory of relativity the basis of his own work. In just the same way, through his friend the architect Erich Mendelsohn —who was entirely unknown at that time— Freundlich came to know at first hand the subtle aesthetic problems of a new architecture. What is fascinating about the development of the Einstein Tower project is to see how scientific, technical and artistic fantasy enter into a sort of *Parallelaktion*; although subject to completely different laws, they converge in a project **like** this **one**." Krausse, et.al., *ibid*, p. 10. Italic is original. Emphases are added.

Unterseeboot,
ca. 1914
Submarine



Einsteinturm
1921
Einstein Tower



Schema eines
Periskops
Diagram of a
periscope

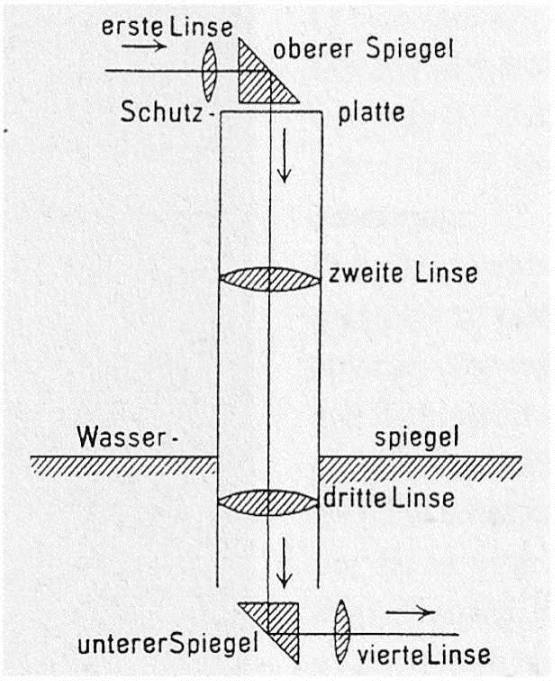


Figure 3.18 The submarine boat and its periscope diagram has been taken as a model by Erich Mendelsohn for the optic formulation of Einstein Tower's observatory and it's underground and ground level spatial configuration, the technical requirements and the path to be followed by the light. From *From The Great Refractor To The Einstein Tower*, Joachim Krausse, et. al., (1996), p. 19.

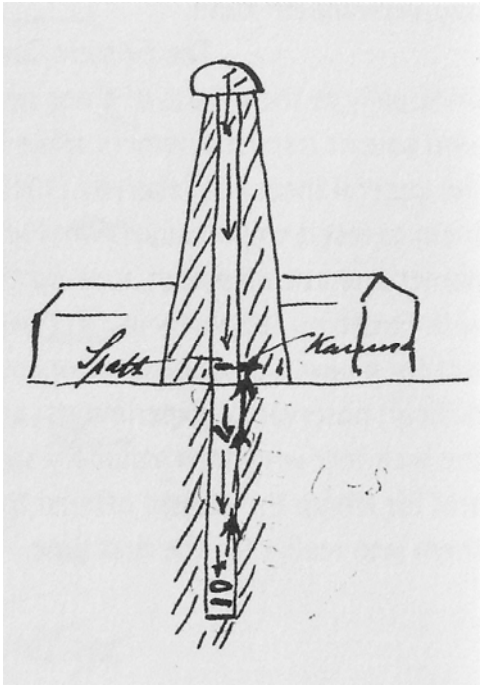


Figure 3.19 Erwin Freundlich's early sketch of the spectrograph of the Einstein Tower in Postdam. This sketsch shows a perpendicular arrangement of the subterranean spectrograph together with a horizontal above-ground laboratory. From *From The Great Refractor To The Einstein Tower*, Joachim Krausse, et. al., (1996), p. 68.

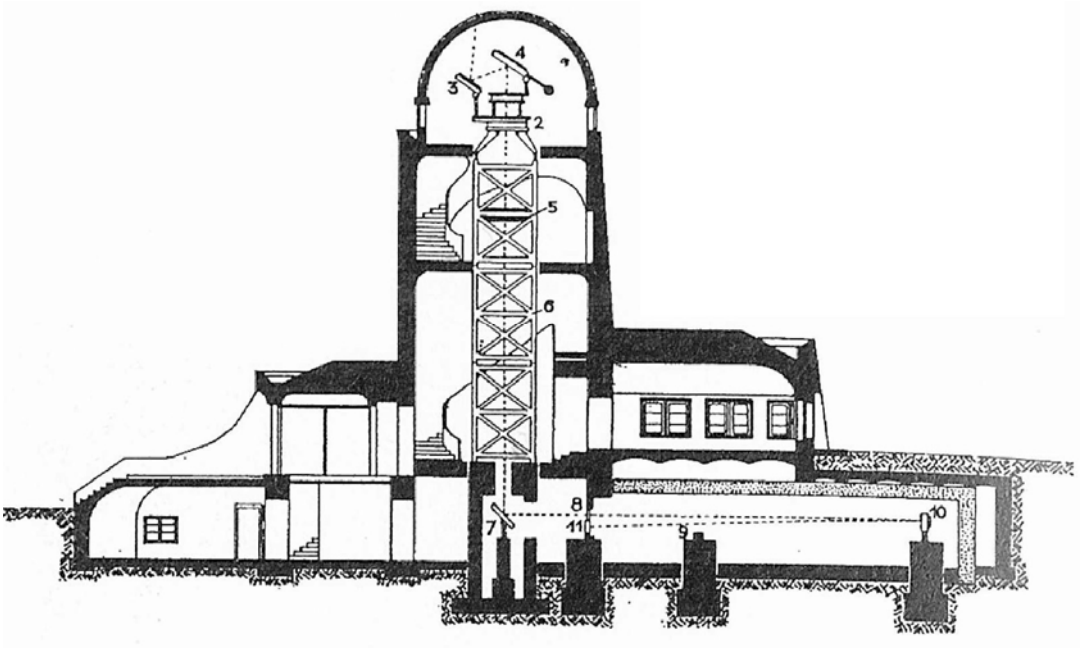


Figure 3.20 Section through Erich Mendelsohn's Einstein Tower with path of light drawn in. From *From The Great Refractor To The Einstein Tower*, Joachim Krausse, et. al., (1996), p. 68.

> "When the observatory was finished, Mendelsohn conducted Einstein round the building, and he was naturally anxious to learn the great scientist's opinion of it. Einstein went round the building and examined the interior, but said nothing. Hours later, during a meeting of the building committee and the architect held in the main observatory, Einstein suddenly got up, crossed the room, and whispered in Mendelsohn's ear: 'Organic.'"[361]

Leaving Giedion aside, even Bruno Zevi has found, a relation between Mendelsohn and the Relativity Theory, that is, his reception for "the principle of indeterminacy,"[362] and even more important than that he has equated the concept of time with the fourth dimension and motion.[363]

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[361] Arnold Whittick, *Eric Mendelsohn*, (2nd ed, N.Y.: F. W. Dodge Corp., 1956), p. 57. "Einstein's opinion of the Tower was expressed in one word: 'organic.'" in Zevi, *ibid*, p. 59.

[362] "It was Prof. Freundlich's idea to build a tower telescope to start 'solar-physical' research with exact experimental means. The test of the general deviation of all the sun's spectral lines, predicted by the Theory of Relativity, demanded such experimental auxiliary means. For this purpose Prof. Freundlich conceived the new idea of combining a tower-telescope with a fully equipped physics laboratory. The technical execution of this telescope lay in the hands of two engineers at the industrial plant of Zeiss in Jena. The first sketches for the tower were drawn at the Russian front in 1917. As can be understood, the idea of this building enticed and excited the young architect. Here he could show for the first time his conception of a new architecture, **analogous to an entirely new idea in physics.**" Zevi, *ibid*, p. 58. Emphases are added.

[363] "They agreed on **dynamism, motion** and also on **space-time**, but they felt that the new revolutionary impetus should not only implicate **the onlooker, the man walking around and inside the building, but also nature, the genetic structure of the building itself**.

(…) The meeting saw a comparison between **three concepts of space and time: the cubist concept based on the movement of the viewpoint; the futuristic concept, which applied kinetic elements like lifts and conveyors inside and outside buildings; and lastly, the expressionist concept that argued in favour of the fourth dimension, motion,** provided that it belongs to the intrinsic reality of the building and is emanated from the latter.

(…) Does **insisting** on the mass and on the reality of material not come to the same thing as **standing aside from the spatial and temporal language of modern architecture based, it is said, on the "fourth dimension"?** (…) These suspicions are cleared by establishing a direct comparison with "De Stijl", the movement that is most strongly committed, especially in the studies by Theo van Doesburg, to providing a grammar and syntax for **the space-time ideology. The objective is to overcome the third dimension.** (…) After the Second World War, when the 'informal' trend annihilated the abstract, stripping studies derived from cubism and reinstated material and gestual values, the architects were left perplexed and disconcerted. For the sake of being *á la page*, some critics hastened to put forward theories regarding **the end of space-time vision** and the return to a more **static vision of architecture**; leaving aside his own merits, Louis Kahn also owed his sudden success to this involution. (…) The only European master who opposed this dissipation was Le Corbusier: he recorded the deterioration of rationalist codes and the charge in the dramatic anathema of Ronchamp, establishing an indirect link with expressionism and reproposing Mendelsohn's hypothesis: **a spatial-temporal frame, the fourth dimension without omitting the third, without fear of the plastic mass.** It is this hypothesis that makes Mendelsohn's message seem even more prophetic today: it points to a road that runs back to Michelangiolo, Borromini, Neumann, **but using**

On the other hand, while Zevi constructs parallelism between fourth dimension and motion in his narrative concerning the architectural history, he paradoxically criticizes Giedion's narrative because of parallelism between fourth dimension, time and relativity as well. Although Zevi renders parallelism between plasticity of the expressionist concept and the motion and fourth dimension, he also is aware of the fact that Mendelsohn does not have the same intention:

> "**Movement** is the qualifying feature of the Stuttgart Department Store. But can it be compared to the so-called **Cubist 'fourth dimension'?** This question is covered in greater detail in the introduction. Here, we need only recall that Mendelsohn never believed in the **'fourth dimension'** in the sense advocated by Giedion in *Space, Time and Architecture*; even less so in the relationship between this concept and that of **'time = fourth dimension' proposed by the theory of relativity.** Having spent much time with Einstein and his collaborators, he did not need Picasso's help to understand these discoveries. When *Space, Time and Architecture* was published, also to avenge himself for the fact that his name was not even mentioned, Mendelsohn sent a copy to Einstein, asking the latter to moment on the pages concerning the theory of relativity. Einstein replied: '**This is a bluff lacking any logical basis.'**"[364]

According to another source, the reply of Einstein has been as follows:

> "Arnold Whittick, the biographer of Eric Mendelsohn, describes how the architect of the Einsteinturm, on discovering that his name was not mentioned in *Space, Time and Architecture,* ripped out of Giedion's book those pages where Relativity and Cubism were brought into relationship with one another and sent them to Einstein. It was a successful counterattack, for the physicist replied:
>
> There's ease in innovation's spread
> If thereby nonsense dare be said
> For seldom is there any chance
> Of new ideas *and* common sense.

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the key of contemporary science, the theory of relativity, the principle of indeterminacy. Faced with this dilemma: **loyalty to the rationalist language of time and space or a revival of academic three-dimensionality**, the architects could make another choice, indicated by Wright, Mendelsohn and lastly by Le Corbusier - **the fourth dimension, as an active force, a step forward, beyond the third.**" Zevi, *ibid*, pp. lxxv, lxvi. Emphases are added.

[364] Zevi, *ibid*, p. 151. Although Zevi does not give a direct reference, the only letter from Albert Einstein under the title "Letters to Mendelsohn" in *Biographical Details* dates back to November, 1941, p. lxxxiv. Emphases are added.

According to Whittick, this is supposed to have taken place in the year *Space, Time and Architecture* was published, 1941."[365]

The tension resulting from Giedion's exclusion of expressionism and Mendelsohn from his book *Space, Time, and Architecture* stems,[366] according to Zevi, from the prejudiced attitude of Giedion against expressionism. In his statement, "While J.M. Richards, in his short work *An Introduction to Modern Architecture* (1940), did not have enough space to dwell on Mendelsohn, and he limited himself to commenting on the pavilion at Bexhill-on-Sea, the case of Sigfried Giedion is completely abnormal and sensational." Zevi quotes from Giedion and emphasizes the allusion of Einstein Tower: "(...) 'The expressionist influence could not be a healthy one or perform any service for architecture. Nevertheless, it touched almost every German worker in the arts. Men who were later to do grimly serious work in housing developments abandoned themselves to a romantic mysticism, dreamed of fairy castles to stand on the peak of Monte Rosa. Others built concrete towers as flaccid as jellyfish.' The allusion to the Einsteinturm is evident."[367]

Giedion, in his book *Mechanization Takes Command* written in 1948, he begins to use the concept of Space-time to indicate his new interest in temporal and spatial

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[365] "Nicht schwer ist's Neues auszusagen,
Wenn jeden Blödsinn man will wagen
Denn seltner füget sich dabei
Daß Neues auch Vernünftig sei."
Arnold Whittick, *Eric Mendelsohn*, (London: ?, 1956), p. ?; Quoted by Georgiadis, *ibid*, pp. 124-125, fn: 168. Altough Georgiadis gives "Arnold Whittick, *Eric Mendelsohn*, 2nd ed., London, 1956" as reference to his quotation, in the U.S. Edition of "Arnold Whittick, *Eric Mendelsohn*, (N.Y.: F.W. Dodge Corp., 2nd ed., 1956)" these lines could not be found.

[366] "*Space, Time and Architecture* appeared in several editions. Giedion integrated the original text with chapters dedicated to Alvar Aalto, Mies van der Rohe, Jörn Utzon. He flaunted his indifference to the criticisms that were made, but nonetheless took them into account and over the course of the years the work became increasingly dense and complete. But to the end he continued to be deaf to two figures: Antoni Gaudi and Erich Mendelsohn." Zevi, *ibid*, p. lviii-lix. With the additional part of the fifth edition in 1967 as included in "On the Limits of the Organic in Architecture" subtitle of the Conclusion part, Giedion drives attention to the fact that Gaudi's principle of collage in his use of mosaics has been a decade before Picasso and Braque and puts emphasis on his genius: "But, despite Gaudi's impetuous genius, the architecture of this century could not then follow his direction" Giedion, *ibid*, p. 874. On the other hand, the name of Mendelsohn is mentioned only once throughout the book: "Although no other designs for the League of Nations building had the clear-sighted rightness of Le Corbusier's plans, there were other very considerable entries, such as those submitted by Hannes Meyer and Hans Witter, R. J. Neutra, E. Mendelsohn, and the Polish group Prezens." Giedion , *ibid*, p. 536.

[367] Zevi, *ibid*, pp. lviii-lix.

features of motion, eliminating it from references to Relativity theories and modern art. Due to the critics on parallelism between Relativity theories and modern art he becomes to be insecure about Space-time:

> "'A prominent surgeon,' writes Gilbreth in connection with one of his experiments, 'is perfectly willing to be photographed performing a delicate operation but when the fact is mentioned that this is being done to find the similarity between his actions and other skilled workers, be becomes scornfully incredulous. How can such a thing be? He, a skillfully trained, highly developed product of long years of study to be likened to a bricklayer!' **With the same contemptuous incredulity, a well-known physicist rejected the idea of a relation between the methods of present-day physics and the methods of contemporary art**."[368]

Giedion is not alone in his interest to make a connection between art and natural sciences, as is widespread among the art historians. Another vehement advocator who supports Giedion's claim that there exist a relationship between Cubism and Einstein's Relativity is the art historian Paul M. Laporte. In his essays "Space-Time Concept in the Work of Picasso," "Cubism and Science" and "Cubism and Relativity"[369] Laporte tries to adapt to Cubism the concepts of space-time, simultaneity of Minkowski's four-dimensional space-time continuum and Einstein's Theory of Relativity. In his article "Cubism and Science" written in 1949, Laporte states:

> "It may very well be argued . . . that the introduction of non-Euclidean geometry into physics on the one hand, and the breaking away from occidental perspective on the other hand, are correlative movements in the evolution of the western mind. Furthermore, the new pictorial idiom created by cubism is most satisfactorily explained by applying to it the concept of the space-time continuum. That this explanation is legitimate is at least indicated by Apollinaire's references to non-Euclidean geometry and the fourth dimension . . . .
>
> The integration of non-Euclidean geometry with the fourth dimension is a constituent factor in contemporary physics. This happened in physics at exactly the same time as the change to cubism happened in painting

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[368] Giedion, *M.T.C.*, p. 104, fn. 53. Emphases are added.

[369] Paul M. Laporte, "The Space-Time Concept in the Work of Picasso," *Magazine of Art*, XLI (Jan. 1948), pp. 26-32; "Cubism and Science," *Journal of Aesthetics and Art Criticism*, VII (Mar. 1949), pp. 243-256; and "Cubism and Relativity," *Art Journal*, XXV, no. 3 (Spring 1966), pp. 246-248.

(Einstein, *Special Theory of Relativity,* 1905; Minkowski, 1908; Picasso's first cubist picture, *Les Demoiselles d'Avignon,* 1906-07)."[370]

Laporte tries to make superficial analogies based on word similarity between what he has misread as Einstein's and Minkowski's theories and Cubism. Laporte's analogy is rather on "simultaneity," which he has interpreted as "masslessness":

> "Instead, attention was paid to relationships, and allowance was made for the simultaneity of several views. The consequence of this new approach was, respectively, a seeming 'distortion' or dissolution of bodies in painting, and the famous convertibility of mass and energy in the Theory of Relativity"[371]

As a reply on the 4th of May, 1946 to the essay "Cubism and Science" Laporte has sent to Albert Einstein to take his opinion, Einstein has repeated once more that there can be no connection in between the Relativity Theory and Cubism.[372] The interesting

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[370] Laporte, "Cubism and Science," p. 254. Quoted by Dalrymple Henderson, *ibid*, p. 353, in Appendix A "The Question of Cubism and Relativity."

[371] The subtitle of Laporte's essay written in 1966 "Cubism and Relativity" is "with a letter of Albert Einstein"on p. 246. In this essay, Laporte advocates the article he has written in 1945 as a response to the criticizing letter from Einstein.

[372] "I find your comparison rather unsatisfactory. If I disregard the practical value of a science I do see a similarity between the scientific and the artistic activity. Both attempt to assemble from parts a whole which by itself is indistinct — (*ein an sich unuebersichtliches Ganzes*) in such a way that the resulting order creates distinctness and clarity. The distinctness and clarity thus achieved gives us a satisfaction of a high order. This occurs both in science and in art. In science, the principle of order which creates units is achieved through logical connection while, in art, the principle of order is anchored in the unconscious. The artistic principle of order is always based on traditional modes of connection (*Verknuepfungsweisen*) which are felt as equally compelling by those who live in this tradition as the logical connection is felt by scientifically oriented men. …The essence (*Wesen*) of traditional modes of connection in art shows itself clearly in the simple forms of art, e.g. the musical melody and the ornament, which are based on intuitively felt (*fuehlbarer*) regularity. In both cases the means of achieving clarity are felt to be necessary, just as in mathematics logical conclusion is felt to be necessary. In more complex forms of art the means of creating clarity or 'unity' are less easily recognized. (…) Consequently, a work of art can be experienced and evaluated such only by those in whom the respective traditional modes of connection are alive. For these modes of connection there is no other sanction than their living existence. If they are given, the work is good or bad in relation to them. According to the perfection with which, based on the traditional modes of connection, the impression of lucid unity is achieved. (…) If the foregoing is correct it would be absurd to try to evaluate traditional modes of connection as it were the languages of the periods of art in their relation to each other. (…) Now, as to the comparison in your paper, the essence of the Theory of Relativity has been incorrectly understood in it, granted that this error is suggested by the attempts at popularization of the theory. For the description of a given state of facts (*Sachverhalt*) one uses almost always only one system of coordinates. The theory says only that the general laws (*Gesetzmaessigkeiten*) are such that their form does not depend upon the choice of the system of coordinates. This logical demand, however, has nothing to do with how the single, specific case is represented. A multiplicity of systems of coordinates is not needed for its representation. It is

thing is that, in his essay "Cubism and Relativity," Laporte has referred to Sigfried Giedion's *Space, Time, and Architecture* and Alexander Dorner's *The Way Beyond 'Art'* in order to support his ideas.

Parallel to Einstein's insistent rejection, Dalrymple Henderson as well alleges that rather than Cubists' theories of Einstein and Minkowski, they have instead been influenced by *n*-dimensional geometry, which has begun to be fostered in the 19th century.[373] On the other hand, the mathematician Manuel Corrada thinks that the interest on mathematical new ideas of the Cubists, Suprematists and Constructivists, all criticizing "the role of visual representation of reality," originates from their compatibility to non-naturalistic representations they have been searching for.[374]

As for Sokratis Georgiadis, he addresses not only to Giedion and Laporte as the supporters of parallelism established in between Einstein's Theory of Relativity and Cubism, but instead to Werner Haftmann's work written in 1955 under the title *Malerei im 20. Jahrhundert*[375] and C.F. Waddington's work published in 1969 as *Behind*

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completely sufficient to describe the whole mathematically in relation to one system of coordinates. (…) This is quite different in the case of Picasso's painting, as I do not have to elaborate any further. Whether, in this case, the representation is felt as artistic unity depends, of course, upon the artistic antecedents (*kuenstlerische Vorgeschichte*) of the viewer. This new artistic 'language' has nothing in common with the Theory of Relativity." Laporte, "Cubism and Relativity," p. 246.

[373] "…however, the Cubists were not influenced by Einstein's relativizing of simultaneity nor by Minkowski's ideas on 'space-time.' Instead, their 'fourth dimension' was an outgrowth of nineteenth-century *n*-dimensional geometry, a fact that provides a valuable insight into the time element in Cubist painting ('space-time') and the resultant juxtaposition of images ('simultaneity')." Dalrymple Henderson, *ibid*, pp. 89-90.

[374] "On the one hand, advance in mathematics contributed to support the metaphor of progress. On the other hand, mathematics represented a new way to approach visual arts problems and also created an appropriate place to look for non-naturalistic shapes according to the ideals of both Constructivism and Suprematism." Manuel Corrada, "On Some Vistas Disclosed by Mathematics to the Russian Avant-Garde: Geometry, El Lissitzky and Gabo", in *The Visual Mind: Art and Mathematics*, Michele Emmer, ed., (3rd ed., Cambridge, Mass.: The M.I.T. Press, 1995), pp. 235-242.

[375] Werner Haftmann, *Painting in the Twentieth Century* (London: Lund Humphries, 1968). Originally published in 1955 as *Malerei im 20. Jahrhundert*.

"Dates seem to suggest that some kind of connection exists between science and painting. The radical changes in painting took place between 1900 and 1910. Significant dates are: 1905 Fauvism: 1907 Cubism: 1910 the first abstract painting. A concordance of dates important in the history of science runs thus: 1900 Planck's quantum theory and Freud's *Interpretation of Dreams'*, 1905 Einstein's special theory of relativity; 1908 Minkowski's mathematical formulation of the dimensions of space-time. (…) The Italian Boccioni, the Frenchman Delaunay, the Russian Kandinsky and the Germans Franz Marc and Paul Klee all tell us expressly that their encounters with the discoveries of natural science often threw light upon their own intuitive and exclusively artistic activity." Haftmann, *ibid*, p. ?. Quoted by Georgiadis, *ibid*, p. 124.

Apperance — A Study of the Relations between Painting and the Natural Sciences in this Century.[376]

On the other hand, in his book titled *Modern Art and Scientific Thought*, which is one of the first studies that focus on the notion that there exists no direct connection between modern art and modern science and for the relationship generally believed to exist, that it is science which is seen as a means where art expresses and justifies itself, John Adkins Richardson strives, instead of making direct connections, to re-read and demystify modern art and artists via concepts and approaches of modern scientific thought. In his work, Richardson not only indicates that the connection between Cubism and Theory of Relativity is hermetic as much as mistaken,[377] but also attempts to establish the genealogy of the reception of time conception as "fourth dimension.[378]

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[376] "The main notions which painters seem to have carried away from the new physics were these: that matter is less solid, more transparent as it were, than it had been thought to be; that motion cannot really be frozen into a timeless instant; that a real body cannot be properly seen from one perspective point, but that there are many spatial frames which can be applied to it, and that all these are of equal validity." C.F. Waddington, *Behind Apperance - A Study of the Relations between Painting and the Natural Sciences in this Century*, (Edinburgh: Edinburgh Uni. Pr., 1969), p. ?, Quoted by Georgiadis, *ibid*, p. 124.

[377] "The fragmentations of Cubist art did not derive from simultaneous presentations of shifting points of view, but even if they had they would be unconnected with the Theory of Relativity. Thus, it can be argued that the entire notion of a hermetic connection between Einstein's theory and Cubism is false. And, in fact, Einstein himself voided the connection." Richardson, *ibid*, p. 111.

[378] "Thus, by the end of the nineteenth century, serious fiction as well as pseudo-scientific writing had prepared a certain segment of the reading public to accept the idea of time as a dimension. And the appearance of the space-time world of modern physics confirmed in these people's minds the justice of the notion.

The historical background of the idea of time as a dimension in science begins with the Michelson-Morely experiments, which attempted to establish the velocity of light through a hypothetical 'ether,' involves the theoretical merit of the theories of Einstein and the value of the hypotheses of Lorentz, and, all in all, is extremely technical both in conception and lineage. Suffice it to say that the *popular* (and quite mistaken) view of space-time is embodied in the casual statement: 'Time is the fourth dimension of space.' That view assumes that the prosaic or historical meaning of time as past, present, and future states is destroyed. It holds, in other words, that time in the sense of duration or of a sequence of moments is an illusion. In this respect time is viewed similarly to Zöllner's mysterious fourth dimension. In effect, all chat has ever happened or ever will happen is presumed to have occurred simultaneously. Thus, everything is, from the classical standpoint, coexistent; it is only because we perceive of it in segments that we say 'time passes.' Time, metaphorically speaking, is a yardstick, a given space; some people (e.g., Nero) are at fifteen inches, others are at two feet, and so on and so on. Of course, since no one can see the yardstick at all except as he moves on it we quite naturally term our sequence of perceptions 'temporal.'" Richardson, *ibid*, p. 108

Except for the parallelism between Theory of Relativity and Cubism, as it currently seems to have lost its impact upon the field of architectural theory,[379] Beatriz Colomina in her article titled as "Where Are We?"[380] and Yves Alain-Bois in his article "Cubistic, Cubic, and Cubist" [381] both claim that there exists no connection even in between Cubism and Architecture.

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[379] For a recent work that furthers this parallelism within the framework of Giedion's conceptualization; John Kurtich and Garret Eakin, *Interior Architecture*, (N.Y.: John Wiley & Sons, Inc., 1996), esp. chapter 3: "The Third Dimension: Navigation of Space," pp. 61-127 and chapter 4: "The Fourth Dimension: Space-Time," pp. 131-175.

[380] Although the architectural historians construct Cubism's genealogy with Le Corbusier in architecture, Colomina puts emphasis on Le Corbusier's positioning within Purism against Cubism and regards the notion where cubism is brought into architectural discourse as a construction of architectural historians:

"These are only some of the milestones. It is difficult to find any history of modern architecture, regardless of its ideology, that omits cubism. It is as central to Manfredo Tafuri and Francesco Dal Co's *Modern Architecture* (1976) as to William J. R. Curtis's *Modern Architecture since 1900* (1982). The first major account of modern architecture to omit the word 'cubism,' whatever one can make of this absence, is Kenneth Frampton's *Modern Architecture: A Critical History* (1980). Picasso, Braque, Gris are not mentioned here either. There is plenty of "suprematism" and Malevich, however, perhaps reflecting the interests of a new generation of architects and critics.

And yet, when I ask my colleagues: cubism and architecture? They all answer 'no relation.' Stanislaus von Moos, for example, insisted that the precipitate analogies established Giedion with respect to Walter Gropius's Workshop Building for the Bauhaus at Dessau (1925-1926) and Picasso's *L'Arlésienne* of 1912 were difficult to maintain today. Many people have demonstrated that one cannot establish such simplistic relations.

(…) If the significance of cubism for architecture is, according to most historians and theorists of architecture, to be found with Le Corbusier, what is normally omitted from these accounts is that Le Corbusier explicitly departed from cubism (his first text coauthored with Ozenfant was, after all, entitled *Apres le cubisme*), repeatedly describing cubism as 'too decorative,' 'too chaotic,' 'the troubled art of a troubled epoch,' 'individualistic,' 'romantic,' 'uncertain of its way,' 'ornamental,' 'obscure,' 'extremely confused,' 'nothing other than anarchy.' Against the 'chaos' of cubism, Ozenfant and Jeanneret would offer 'order,' 'hierarchy,' 'rigor,' 'the laws of structure and composition,' 'efficiency,' 'precision,' 'standards,' 'universal values,' 'the right angle.' (…) If Ozenfant and Jeanneret thought that cubism was a decorative art, it is ironic that Alfred Barr saw purist paintings as 'decoration,' a quality that he attributed precisely to their being 'architectonic': 'Purist paintings were designed architectonically so that they were appropriate decorations for the new architecture which Le Corbusier was just developing.... Purist painting, originally intended to be intelligible to a wide public, achieved its end obliquely through a brilliant poster by Cassandre for the *Wagon-Bar.*'" Colomina, "Where Are We ?", pp. 144, 148-149.

[381] "But what of cubist painting (that is, of the cubism of Picasso and Braque)? Did it have any effect on architecture? Can we find for it any architectural equivalent? We would be wrong, I believe, to look for this at the merely morphological level (the superficial level at which the analogies defining both cubistic and cubic architecture operate). It would have to be found, instead, at the structural level of cubism's formation as a semiological system." Bois, "Cubistic, Cubic, and Cubist," p. 191.

CHAPTER 4

SPACE-TIME

4.1 Excavating the *Space-time* Conception; Between Plagiarism and Migration of the *Space-time* Idea

Assuming that there exists a connection between Cubism and architecture, and positioning himself external to the current widespread view with his groundbreaking article "The Road Not Taken, Alexander Dorner's Way Beyond Art,"[382] Joan Ockman demystifies and historically analyzes the Space-time concept, which is thought have been produced by Giedion. Ockman alleges that the Space-time concept has been produced by Alexander Dorner in the will to make up a new museum concept to construct unity between art and life, within which he aimed at realizing a four dimensional energetic relationship between the modern object and subject, but that Giedion has claimed to be the owner of the concept by using it in his book without giving any reference at all.[383]

The German art historian and the director of the Landesmuseum (Provinzialmuseum) in Hanover; Alexander Dorner as a protagonist and practitioner of modern museology understanding, has aimed to transform the art object-visitor-museum relationship with a new understanding of art different from 19th century's, providing the integration thought to be necessary to take place between actual life and art that has been influential in the first three decades of 20th century. As it has been influential upon his views on art history, he attempts to put into practice Riegl's understanding of "developmental history" consisting of history as a concrete and dialectical sequence of types of vision at the collection of Hanover Landesmuseum where he has been the director of in 1923.[384]

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[382] Joan Ockman, "The Road Not Taken, Alexander Dorner's Way Beyond Art," in *Autonomy and Ideology; Positioning an Avant-Garde in America*, Robert Somol, ed., (New York: Monacelli Pr., 1997), pp. 82-119.

[383] Firstly mentioned in "Introduction," Eve Blau and Nancy J. Troy, in *Architecture and Cubism*, Eve Blau and Nancy J. Troy, eds., (Cambridge, Mass.: The MIT Press, 1997), p. 16, fn. 1.

[384] "In the applied context of the museum, Dorner's practical re-reading of Riegl's art history led him to transform the Hanover museum's haphazard collection into an evolutionary sequence with a strongly

During that period, the city of Hanover as the cultural center of Weimar Republic was including plenty of avant-garde artists, circles and groups.[385]

Apart from his position as director at Hanover Landesmuseum, owing to his presidency at the international Kestner Society that supported art and literature, Dorner has accomplished to bring exhibitions of avant-garde artists and the "new aesthetic" to Hanover.[386] Nevertheless, institutionally hosting these activities paradoxically conflicts with the avant-garde discourse which is opposed to the notion of institutionalization. Despite the nihilistic structure of the avant-garde art breaking off from all sorts of institutionalization, taking the close relationship to the actual life taking as a basis of his point of view, Dorner eliminating the museology understanding from its sublimation and "mausoleum" characteristics and tries to render it as integrated to life. At this point, the avant-garde works for purposes of exhibition such as the *Abstract Cabinet* are faced

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didactic bent. He put major emphasis on the provision of explanatory texts, captions, and guidebooks and, prophetically enough, made efforts to bring audio commentary into the galleries. Most innovative was his concept of the atmosphere room. Instead of presenting artworks as isolated objects or, on the other hand, as stylistic manifestations accompanied by associated decor —as in the traditional period room, with its simulated interior— Dorner attempted to re-create the 'way of seeing,' or *Kunstwollen*, specific to each epoch. He thus distinguished the suites of galleries representing the respective periods by perceptual cues like color. The medieval rooms were rendered dark, causing the luminosity of the works to emerge; the Renaissance rooms were painted gray and white; and the artworks in the baroque galleries were framed in gold and hung on red velvet backgrounds. With this approach, Dorner sought to emphasize the newness of each context, giving art history a sense of both specificity and dynamic development." Ockman, "The Road Not Taken," pp. 86-87.

[385] "Among the artists, architects, and modernists who lived in Hanover during the 1920s were the dadaist Kurt Schwitters; the abstract artists Carl Buchheister and Friedrich Vordemberge-Gildewart and the architect-furniture designer Hans Nitzschke (the latter two of whom were instrumental in founding Gruppe K, an organization of Hanover constructivists along the lines of the G group in Berlin); the expressionist painter Otto Gleichmann; and the modern dancer Mary Wigman. There were also the collector Herbert von Garvens and the Kestner Society impresario Paul Küppers, whose wife, Sophie, would marry El Lissitzky after Küppers' death. The pioneering exhibitions of the Kestner Society (an international society for the promotion of art and literature), the Hanover Secession, and Schwitters' Merz activities, which brought Theo van Doesburg and Lissitzky into Hanover circles, gave the town an avant-garde reputation." Ockman"The Road Not Taken," pp. 84-85.

[386] "After assuming the presidency of the Kestner Society, Dorner was responsible for bringing to Hanover exhibitions and lecture programs on Bauhaus, de Stijl, and Russian art, on modern architecture and design, and on the new film and dance. He was close to Gropius, and invited him to Hanover in 1923 to lecture on the unity of art and technology, a theme that marked the changing orientation of the Bauhaus at this time. Later in the decade and in the early 1930s, Dorner staged a series of exhibitions at the Kestner Society on the design of the mass-produced object. Exhibitions like 'Good Design in Mass-Produced Home Furnishings' and 'Pure Form in Household Equipment' propagated the new aesthetics of functionalism. These exhibitions, like similar shows sponsored by the German Werkbund, were the precursors for the 'Good Design' series to be staged by the Museum of Modern Art in New York a quarter century later." Ockman, "The Road Not Taken," pp. 84-85.

up with the danger of being transformed into a didactic, permanent and institutional character.[387]

The relationship between Giedion and Dorner has indirectly began with the help of Kestner Society, during Dorner's presidency in 1928. On the 9th of February in 1928, for an introductory presentation of his recent book[388] to be released, Giedion has been invited by the Kestner Society in Hanover, in the benefit of its progressive activities, has given a lecture titled as "Bauen in Frankreich, im 19. und 20. Jahrh.; Zur Tradition des Neuen Bauens."[389]

The first sign indicating that Giedion is informed about Dorner's idea of the direct relationship between the art object and its beholder, is the introductory essay of Dorner and El Lissitzky titled as "Living Museum" written in 1929 for *Cicerone* magazine following the success of their work *Abstract Cabinet*,[390] which is constructed in

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[387] "Dorner's synaesthetic concept of the atmosphere room —implemented by the mid-1920s, and to culminate in 1927 in the Hanover museum's most famous room, the Abstract Cabinet— ran counter to conventional museum practice. An attempt to reproduce not just the conditions of seeing but the full sensorium of aesthetic experience of a particular period, including its architecture and music, the atmosphere room had something of the *Gesamtkunstwerk* about it, even if Dorner's intent was manifestly more pedagogical than theatrical." Ockman, "The Road Not Taken," p. 87. As it is remarkable in this quotation Ockman wrongly dates Abstract Cabinet's construction year of 1927 as if "mid-1920s" and uninstalled year of 1932 as if "1927."

[388] Due to the vagueness of its title, publication of the book called as *Bauen in Frankreich, Bauen in Eisen, Bauen in Eisenbeton* has been delayed until the end of May and beginning of July in 1928. See Georgiadis, "Introduction," p. 51.

[389] "A few days after his Berlin engagement, Giedion was in Hanover. In a lecture to Alexander Dorner's Kestner Society, Giedion drew an arc from the first iron constructions of the nineteenth century to the work of Le Corbusier and established himself as 'an enthusiastic **apologist** for the most recent architectural intentions.' According to one attendee, the lecture was accompanied by 'a wealth of largely unknown slides.' On 1 June Giedion spoke on the same topic at the University of Zurich. The publication of his book was announced on this occasion." Georgiadis, "Introduction," p. 47. Emphasis is added.

[390] "Located in the Hanover museum just to the left of the main staircase bringing visitors up from the entry hall to the second floor, the Abstract Cabinet measured 5.32 by 4.40 meters. Lissitzky lined the walls of this small space with over five hundred slats of metal set perpendicularly to the wall plane. Framed by horizontal molding strips at floor and ceiling and spaced two centimeters apart, the slats were enameled white on one side and black on the other. They projected three centimeters from the back wall plane, which was painted gray. A refinement of the scheme at Dresden, which employed deeper and more widely spaced wooden slats, they cast strong vertical shadows, making the wall planes look pleated. Lissitzky varied the color sequence along the length of the walls, flipping the groupings of slats from light-dark to dark-light and vice versa. " Ockman, "The Road Not Taken," p. 91.

"The positioning of the works, hung at different heights and on different types of surfaces, forced the viewer to confront objects in an altogether new way, the architectural context having become as much a part of the viewing experience as the objects on view. Some of the features of the *Abstract Cabinet* are reminiscent of ideas explored in his photographs. For instance, the effect of the open-

Hanover Landesmuseum in 1927[391] (Figure 4.1, 4.2, 4.3, 4.4, 4.5 and 4.6). In this introductory essay that is to occupy a crucial place for his understanding of "Living History," which he regards as the realization of "integration with life," Giedion depicts the work *Abstract Cabinet*, as follows; "This gallery proved that museums need not be

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mesh panels that partially obscure some works is not unlike that created in photograms where lace occludes other items. The introduction of movement in space through sliding panels recalls the movement expressed through multiply exposed images. And Lissitzky's intention to have differing light conditions periodically alter the character of the art and environment is not unlike his use of contrasting positive and negative values in photograms to explore the different effects of light on objects." Margarita Tupitsyn, "Back to Moscow" in *El Lissitzky; Beyond the* Abstract Cabinet*: Photography, Design, Collaboration*, Margarita Tupitsyn, ed., (New Haven: Yale Uni. Press, 1999), p: 23.

[391] "The effect of this 'irrational surface,' as Giedion described it in his article, was that as the viewer moved around the room the walls shimmered and dissolved into 'total intangibility,' destabilizing the visitor's sense of space." Sigfried Giedion, "Lebendiges Museum," *Der Cicerone* 21, no. 4 (1929), p. 103-106, passage quoted, 105. Quoted by Ockman, "The Road Not Taken," p. 91. The abridged version reprinted as "Sigfried Giedion: Live Museum":

"... The design of the abstract gallery in the museum in Hanover was entrusted by Alexander Dorner to El Lissitzky, who, in *The Isms of Art,* describes his own pictures as the 'interchange station between painting and architecture.' Lissitzky had already made one attempt to create a room especially for the display of abstract paintings at the international exhibition at Dresden in 1926, though with more modest means at his disposal.

The surface of the walls appears insubstantial: vertical iron strips are ranged against them, standing close together. (In Dresden it was wooden slats.) Only 5 centimetres in width, these strips throw vertical clefts of shadow and dematerialize the wall to the point where it seems to dissolve completely. You can still see today, in peasants' houses in Catholic countries, pictures of the saints made out of painted glass strips which form and dissolve and form again as the viewer moves from one side of them to the other. Perhaps unconsciously, Lissitzky has adopted this baroque practice and transferred it to abstract art. On this irrational surface are hung the compositions of Lissitzky or Moholy, which can only reveal the life that is in them in this fluid atmosphere.

Periodically the sequence of strips is interrupted to display the calm, flat surfaces of the Dutchman, Mondrian, against a white or black background. At the far end a movable black panel enables pictures by Picasso or Leger to be isolated and studied one by one.

Along the window wall the entrance of light is regulated by vertical strips of white cloth. Drum-shaped glass panels, revolving on a horizontal axis, and pictures by Hans Arp, Kurt Schwitters and others, are arranged in such a way that only one picture is visible at a time. A mirror at the side permits a sculpture by Archipenko to be viewed from the front and the back simultaneously.

This gallery proves that museums need not be mausoleums; it all depends on the hand whose touch gives life to the material.

It is particularly important in Germany, where expressionism has been regarded as the new painting for such a long time, that for once a publicly owned institution should show itself aware of the age in which we live and should raise the whole complex of questions implicit in abstract painting...

Note: Not 'abstract' painting alone; the whole complex question of the new *vision* of our age is involved, from cubism to surrealism. Paris recently saw the publication, by Jean Budry, of an important work by Ozenfant: *Art.* In an extraordinarily convincing way it reveals the inner cohesion between these movements and life in general, by means of subtly selected photographic evidence. We should also remember the work published last year by Andre Breton: *La Peinture surréaliste.* Breton is the spokesman of the surrealist movement; it is a pity that his historic utterances are almost unreadable. Finally we must not forget, in this context, *Du Cubisme,* the Bauhaus book by Picasso's opposite number, Albert Gleizes."

Sigfried Giedion, "Sigfried Giedion: Live Museum" in *Lissitzky: Life, Letter, Texts*, Sophie Lissitzky-Küppers, pp. 382-383.

mausoleums; it all depends on the hand whose touch gives life to the material."[392] His expression stating that the past will remain a "frozen fact" and "dead chronology" as long as there will be no relationship with the present [393] addresses to a connection with the Mausoleum.

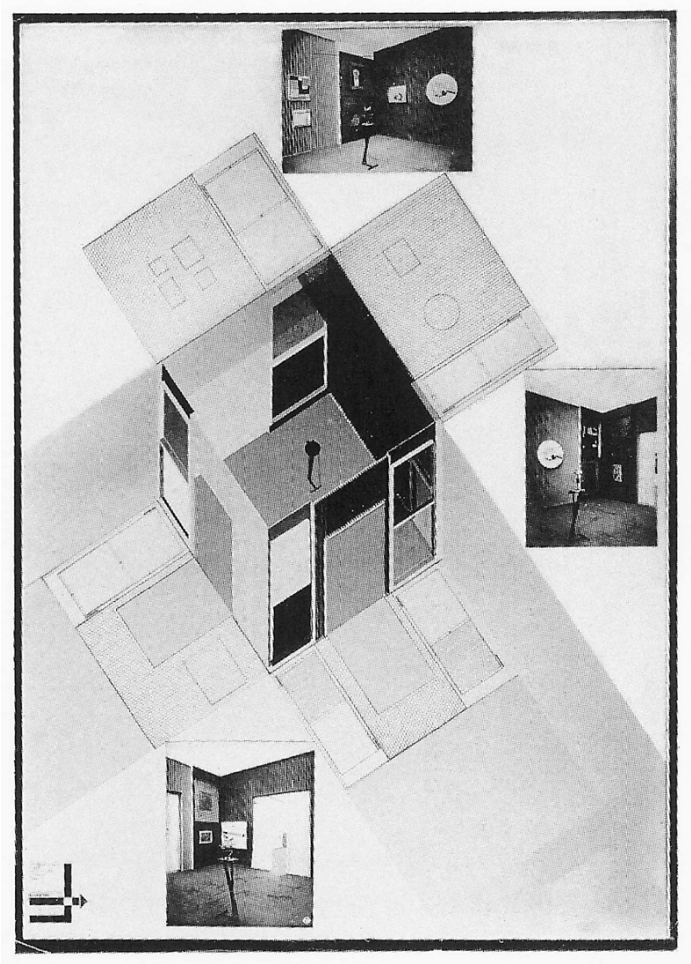

Figure 4.1 El Lissitzky's design for *Room for Constructivist Art* (*Raum für konstruktivische Kunst*) at the International Art Exhibition in Dresden, 1926. Lissitzky used the technique which he will later use in the structure of *Abstract Cabinet* firstly in this exhibition. Gelatin silver print 16.6 x 11.7 cm. Private archive. From *El Lissitzky; Beyond the* Abstract Cabinet*: Photography, Design, Collaboration*; Margarita Tupitsyn, (1999), p. 22.

[392] Giedion, "Lebendiges Museum," p. 106. Quoted by Ockman, "The Road Not Taken," p. 90 and in "Live Museum" in *Lissitzky: Life, Letter, Texts*, pp. 382-383.

[393] "Apart from this approach, history remains a **wilderness of blank happenings in which no creative work is possible**. Only **dead chronologi**es and **limited special studies** will be produced. The historian detached from the life of his own time writes **irrelevant history**, **deals in frozen facts**. But it is his unique and nontransferable task to uncover for his own age its **vital interrelationships with the past**." Giedion, *S.T.A.*, p. 6. Emphases are added.

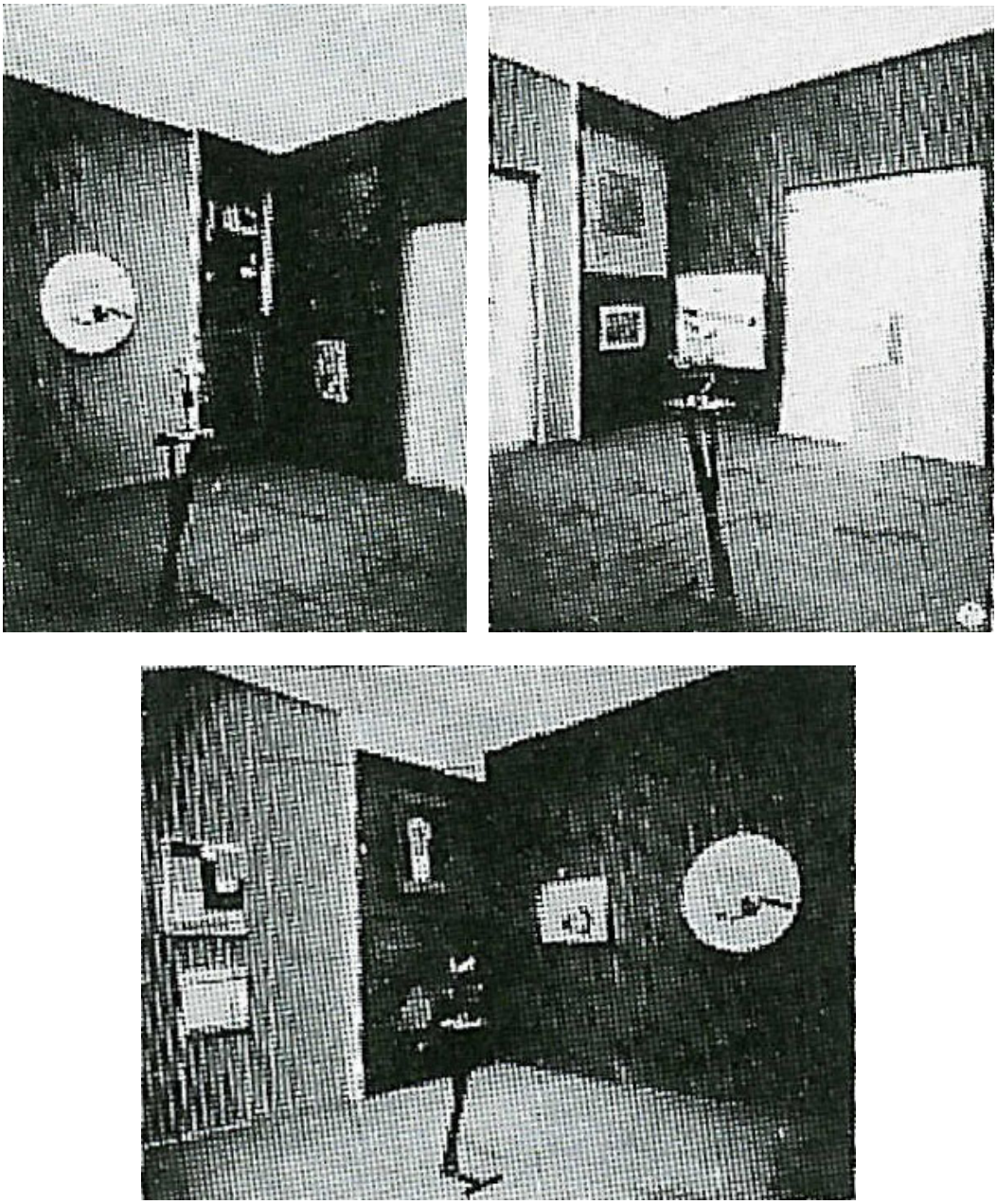

Figure 4.2 Three enlarged details of El Lissitzky's design for *Room for Constructivist Art* (*Raum für konstruktivische Kunst*) at the International Art Exhibition in Dresden, 1926. Gelatin silver print 16.6 x 11.7 cm. Private archive. From *El Lissitzky; Beyond the* Abstract Cabinet*: Photography, Design, Collaboration*; Margarita Tupitsyn, (1999), p. 22.

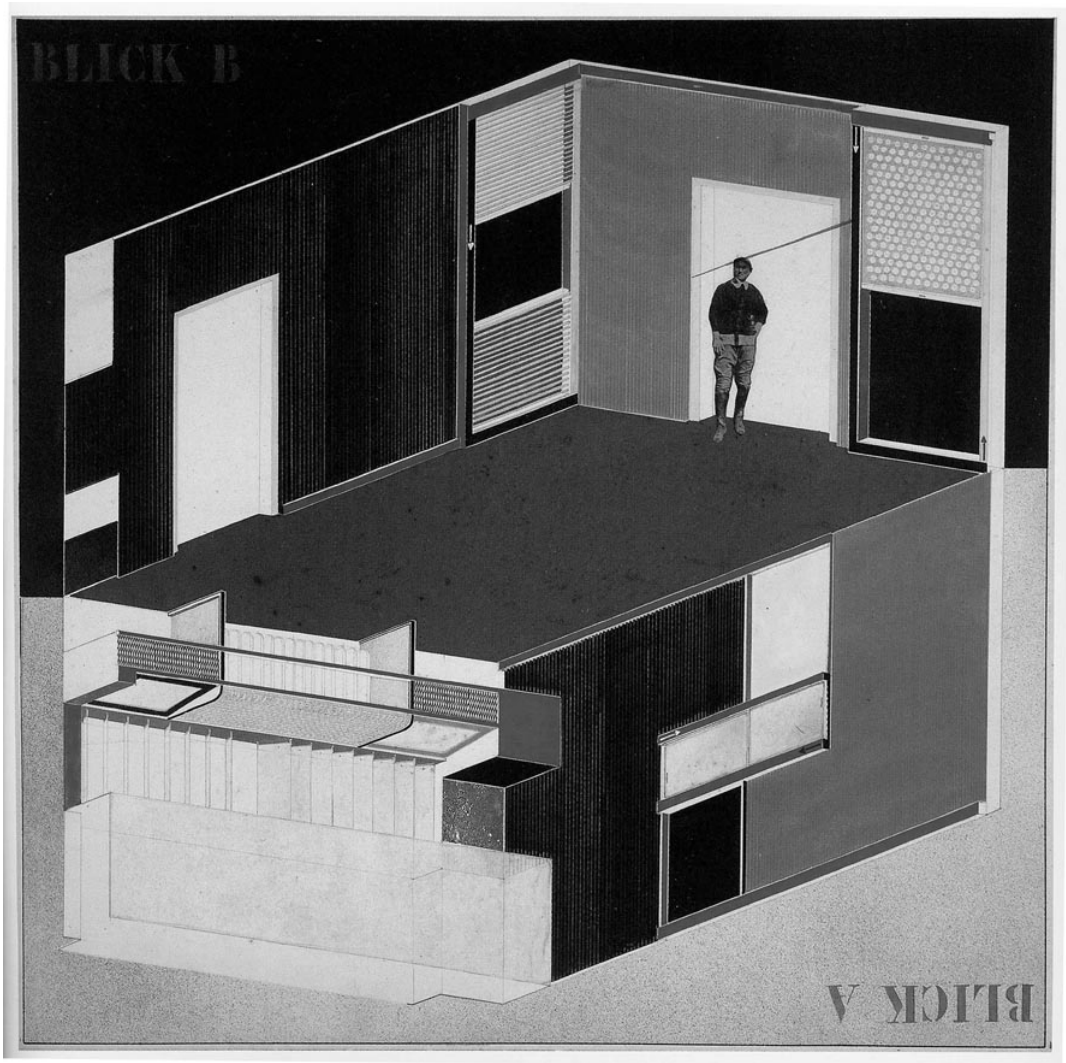

Figure 4.3 El Lissitzky's design for *Abstract Cabinet*, 1927. Gouache, collage. Sprengel Museum Hanover. From *El Lissitzky; Beyond the* Abstract Cabinet*: Photography, Design, Collaboration*; Margarita Tupitsyn, (1999), Frontispiece

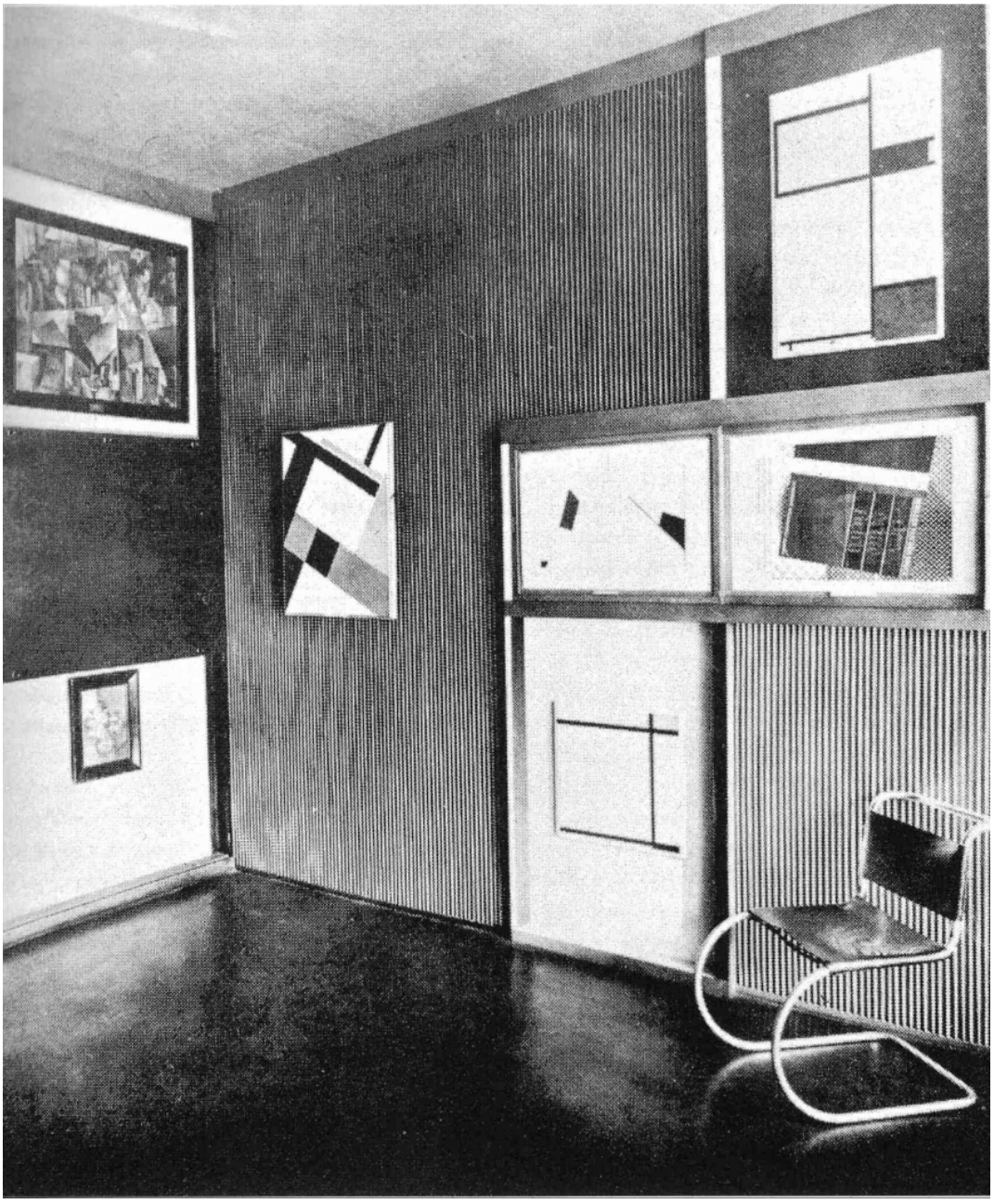

Figure 4.4 Two years before it is demolished; El Lissitzky's *Abstract Cabinet* in Hanover Landesmuseum in 1934. Above the chair by Mies van der Rohe is a poster for Arthur Moeller van den Bruck's Book *Das Dritte Reich* (turned ninety degrees). From *Autonomy and Ideology; Positioning An Avant-Garde in America*, Robert Somol, ed., (1997), p. 99.

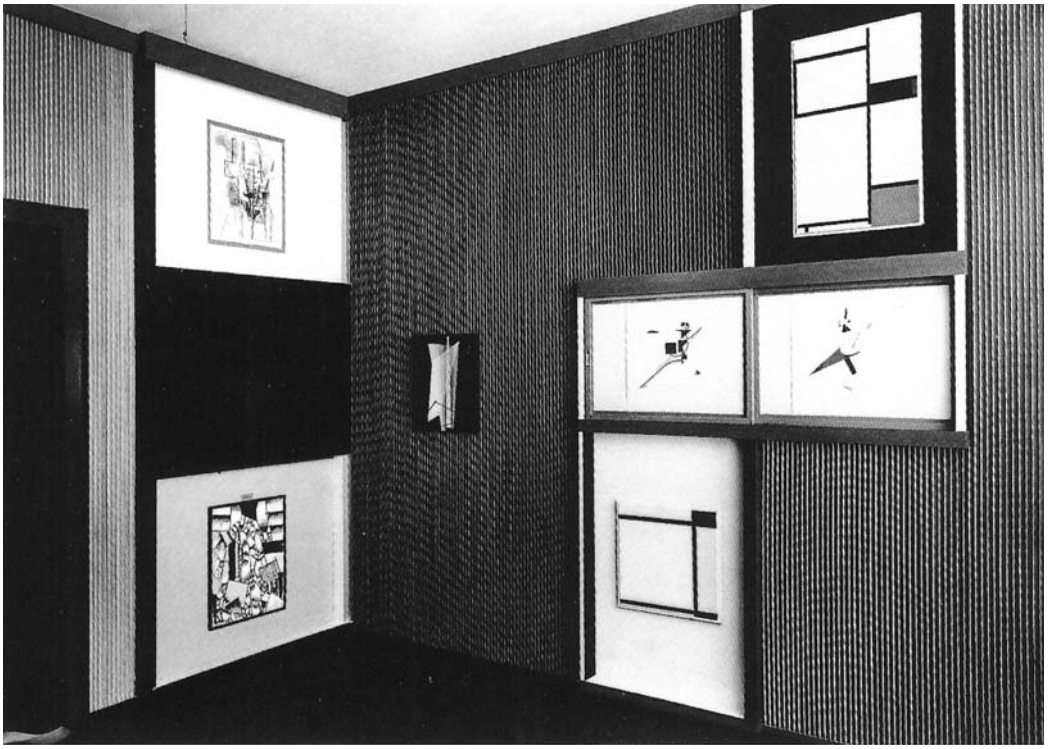

Figure 4.5 El Lissitzky's *Abstract Cabinet* installation at the Landesmuseum in Hanover, ca. 1930. From *El Lissitzky; Beyond the* Abstract Cabinet*: Photography, Design, Collaboration*; Margarita Tupitsyn, (1999), p. 22.

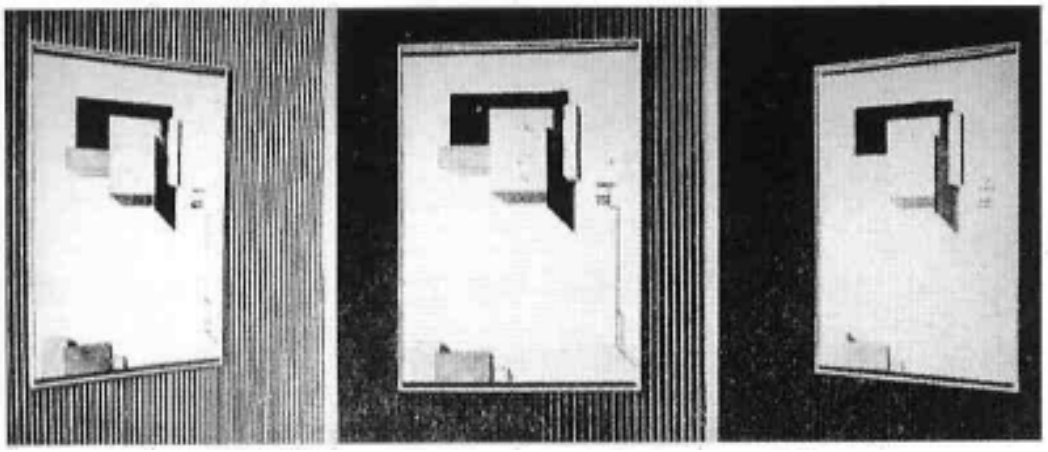

Figure 4.6 Three different photographs of Lissitzky's painting *Floating Volume* (1919) in *Abstract Cabinet*, showing change in coloration of metal wall slats from white to gray to black. From *Autonomy and Ideology; Positioning An Avant-Garde in America*, Robert Somol, ed., (1997), p. 91.

Resembling Giedion's "present-related" history, Dorner's understanding of history was also concerned with the idea that the works of art were to take on their meaning only when their history could be related to the present. The tendency of "actualisation of historical data" and "relating History with the present," which is effective on ideas of both Giedion and Dorner, defined as "deformation of history" by Manfredo Tafuri in an approach of "operative"[394] historiography in his book *Theories And History of Architecture*, referring to both Giedion and Dorner as being operative.[395]

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[394] "What is normally meant by *operative criticism* is an analysis of architecture (or of the arts in general) that, instead of an abstract survey, has as its objective the planning (if a precise poetical tendency, anticipated in its structures and derived from historical analyses programmatically distorted and finalized.

By this definition operative criticism represents the meeting point of history and planning. We could say, in fact, that operative criticism *plans* past history by projecting it towards the future. Its verifiability does not require abstractions of principle, it measures itself, each time, against the results obtained, while its theoretical horizon is the pragmatist and instrumentalist tradition." Manfredo Tafuri, *Theories and History of Architecture*, trans. Giorgio Verrecchia, (London: Granada Pub., 1980), p. 141.

[395] "Dorner sharply criticised *Space, Time and Architecture* (in: *The Way beyond 'Art'*, op. cit.) as regards Giedion's indiscriminate use of concepts like 'space' and 'art'. The opposition between Dorner and Giedion is interesting because it illustrates the clash between two types of operative criticism; Dorner's position is more within the new dimensions dictated by contemporary movements, while Giedion's is half-way between Dorner's and a more traditional evaluation." Tafuri, *ibid*, see chapter "Operative Criticism," pp. 141-170 and fn. 23.

Dorner mentions Giedion's name in his *The Way Beyond 'Art'*:

"Being concerned with the preservation of the 'fundamental unit in variety' it can only point out what is 'till here' instead of stressing what is now here for the first time. So it is bound to hinder modern life instead of aiding it and to widen the gap —which becomes more and more evident— between the reality of modern planning, design and science on the one hand and the reality of stylistic investigation on the other. …"

Dorner adds a footnote here accusing Giedion's point of view of being semi-static philosophy;

"How dangerous that gap is, and how misleading an analysis of modern and historical art movements can be when it contains the dilemma of a semi-static philosophy, is clear in Giedion's *Time, Space and Architecture* (Cambridge, 1941). Giedion sticks to timeless Adam facilities, as for instance 'Space.' So modern architecture and painting still represent the eternal human desire to express 'movement in space.' And there are THE eternal 'basic elements' of architecture which in modern architecture are only 'more rationally arranged' (obviously according to an equally timeless reason). The consequence of this semi-absolutistic philosophy is a bleeding of the real creative force behind all modern movements. Fundamentally Borromini and Tatlin, Turner and Paxton, the Surrealistic Picasso and the stroboscopic photographer, Leibniz, Newton and Einstein, Plato and Dewey all work with the same timeless human concepts. What else can modern art and architecture become under these circumstances but a new arrangement of basic elements, i.e. a 'new style' — or as Giedion calls it, 'a new tradition.' With good instinct Giedion is fighting the split-personality of today, yet he does not realize that his own philosophy is still a typical split-philosophy that tries to preserve timeless elements in a world of change. According to Giedion's analysis, modern architecture lives still in the Newtonian world. Small wonder that the conclusion has been drawn from this book that modern architecture and art are far behind the natural and economic sciences and of very little help in solving our vital problems. We would not make an exception to the policy of our study and go into this criticism of an otherwise very useful book by one of the few pioneers in the history of modern architecture, were it not for showing how dangerous to future progress any semi-static philosophy of art and history roust be."

Two years later, the relationship between Dorner and Giedion has been furthered as Giedion has invited Dorner to collaborate in the organization of International Congresses of the Contemporary Museum, which has been planned to take place in 1931, but never been realized. [396]

Regarding to his book *Bauen in Frankreich, Bauen in Eisen, Bauen in Eisenbeton* published in 1928 and various articles where his ideas were revealed to constitute the basis of his latter books, Giedion manifests his interest in the new relationship between art and science which has begun in 1930;

> "We do not fashion this material by imitating the human figure, but rather by investing the material's intrinsic laws. The result is a new, cold but absolute kind of beauty, albeit now without a hidden relationship to the inner developments occurring in twentieth-century man. The incredible domain of 'extrahuman' phenomena is also slowly revealing itself to us in other areas. This is as evident in the painting and sculpture of our time as it is when take an emotionally-charged look into a microscope or are confronted with the abstract forms created by builders."[397]

Dorner continues on with his text emphasizing the "open growth";

"… Only by being regarded as open growth can art history be saved from that precarious situation." Dorner, *The Way Beyond 'Art'*, p. 145.

Joan Ockman also attaches Carola Giedion-Welcker's argument to this debate;

"In other words, while both Giedion and Dorner were proselytizers for modernist aesthetics, Dorner's position is avant-gardist while Giedion's is ultimately classicizing. This philosophical difference also comes to the fore in a review of *The Way Beyond 'Art'* published in 1949 in the Swiss journal *Werk*. The author, Carola Giedion-Welcker, art historian and wife of Sigfried Giedion, criticizes Dorner for his excessive positivism, implicitly sharing her husband's view: 'Das Ineinanderfließien von Tradition und Verwandlung, von 'spirit of change and spirit of conservation' ... wie es der englische Philosoph A. N. Whitehead in seinem Buch *Science and the Modern World* zusammenfassend präzisierte, wird hier völlig negiert und durch die Auffassung der pragmatischen Philosophie des Amerikaners J. Dewey ersetzt mit dem Leitgedanken: 'Growth itself becomes the only moral end.'...Bedenklich ist, daß der Verfasser immer noch mit einem unbeirrbaren Fortschrittsgedanken argumentiert.'" C. Giedion-Welcker, *Das Werk* 4 (1949), p. 50. Quoted by Ockman, "The Road Not Taken," p. 333, fn.19.

[396] "Further contact between Giedion and Dorner would take place two years later when Giedion enlisted Dorner's collaboration in the establishment of an international 'Congrès du Musée Contemporain,' which he hoped to convene on a regular basis at La Sarraz, Switzerland, under the patronage of Helene de Mandrot. In June 1931 a questionnaire with a cover letter signed by Giedion, Dorner, and Pierre Andry-Farcy (a progressive museum director from Grenoble) was circulated to an international group of artists and museum administrators. Despite Giedion's strong interest in the project, which was modeled on CIAM, the response was disappointing, and the Congresses of the Contemporary Museum failed to materialize." Dorothée Huber, *Sigfried Giedion: Wege in die Oeffentlichkeit*, (Zurich: GTA/Ammann Verlag, 1987), pp. 66-73. Quoted by Ockman, "The Road Not Taken,"p. 333, fn. 20.

[397] Sigfried Giedion. "Der architekt und die Konstruktion (Bemerkungen zur garage Citroën, Rue Marbœuf, Paris) – Schluß" in *Neue Zürcher Zeitung*, no. 209, (2 February 1930), p. 8. Quoted by Georgiadis, *Sigfried Giedion*, p. 92.

According to Georgiadis, those subjects, which were to constitute the basis of the book *Space, Time and Architecture* and to guide the relation between art and science and further progress of Giedion himself, were hidden therein. In this regard, Giedion establishes a chain by means of equalization, firstly, of art and architecture, then to be followed by that of art and science —science is represented by the word microscope—. Hence, these are rendered as the domain of "extrahuman." What would provide for "the unity of all culture," namely for what Giedion considered to be his actual goal, were Science as he perceived to be the "inventions" and art as he perceived to be the new "feelings" and their "means of expressions." In the following, Georgiadis expresses the way in which science should be adapted to "extrahuman" in order to provide for unification of culture;

> "Importantly though, the role of the conveyor of the 'extrahuman' element was not to be assumed by the emotions, but rather by another authority: science. Consequently, the (undefined) 'extrahuman domain' could not be a non-palpable metaphysical entity, but had to be an objectively tangible reality; otherwise the mediation of science would be pointless. The result of all this was to imply an analogy between scientific knowledge and artistic expression."[398]

Departing from this analogy Georgiadis has discovered in an essay written by Giedion in 1932, Giedion constructs a relation with Cubism and modern physics. According to Georgiadis, as the characteristics of Cubism were paralleled to those of science, science could then be rendered valid for modern architecture:

> "After linking Cubism to modern physics, he described the former in the rest of his text as a 'generally valid means of expression', and as 'neutral', and 'absolute'. These characteristics, which had been used to describe science (or, more accurately, a certain concept of science), were also obviously considered to be valid for modern architecture."[399]

Prior to the course of time during which architecture is related with science via Cubism as discovered by Georgiadis, the most important name who has been influencing Giedion to adopt the unusual relation between architecture and Cubism, according to Ockman, is Alexander Dorner.

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[398] Georgiadis, *Sigfried Giedion*, p. 93.

Giedion finds out the means of expression that he has been looking for Modern architecture during the formation of the "new aesthetics" by means of abandoning the "tradition of conventional tectonics." According to him, this is technically possible: by construction techniques and optical developments. What Giedion wishes to express by optical developments is particularly the collage technique of Analytic Cubism in the field of painting, where perspective's single focused, centripetal and authoritarian view was broken. In the essay he has written for the death of Theo van Doesburg in 1931, Giedion repeatedly tries to make the importance of the relationship current which he thinks to exist between architecture and painting, two decades after the discussions held: "Without the pioneering efforts of painting, architecture would have remained formally unemancipated and restricted, in spite of the existence of modern methods of construction."[400] Stating as such and slightly transforming Van Doesburg's claim[401] that there can be no integrity constructed between architecture and art where any resemblance to be established between architecture and Cubism cannot go beyond the

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[399] Georgiadis, *Sigfried Giedion*, p. 93.

[400] Georgiadis, *Sigfried Giedion*, p. 91.

[401] Three critical articles of Theo van Doesburg, who conceives of Cubism not only as an optical problem, but also as a problem of form in context of the dilemma of ornamentation–simplicity, can be taken into consideration: "Swiss ABC for a Logical Building Method," *Het Bouwbedrijf*, Vol. 4, no. 15, (July 1925), pp. 352-355; "The Misunderstanding Cubist Principles; In Czechoslovakia and elsewhere," *Het Bouwbedrijf*, Vol. 3, no. 10, (September 1926), pp. 346-349; and "Architecture on Paper; The trap of a romantic constructivism," *Het Bouwbedrijf*, Vol. 3, no. 13, (October 1926), pp. 424-427; reprinted in *On European Architecture; Complete Essays from Het Bouwbedrijf 1924-1931*, Theo Van Doesburg, translated by Charlotte I. Loeb and Arthur L. Loeb, (Basel: Birkhäuser Verlag, 1990).

Doesburg has considered that as a result of simplification, the construction requisites of modern architecture would be encountered only on the condition that they exceed aesthetic/decorative and formal intentions. According to him, Cubism is the reduction of nature, as an insight fostered by the French painter Paul Cézanne, into five basic abstracted geometric forms as cone, sphere, parallelepiped, cube and pyramid. In his opinion, this abstraction underpins the basis of being cubist. Furthermore, he advocates that there can be no relationship between architecture and art beyond aesthetics-decoration; and also that those architectural works labeled as Cubist have been mislabeled. He alleges in *Het Bouwbedrijf* in July 1925 that, within the three building trends he has identified as Ortoghogonal, Elemantarist and Cubist, the characteristics of "correct" Elementarist architecture that is based on principles of construction have been "mislabeled" as "Cubist". In his opinion, Cubism is a formal trend. In his article "The Misunderstanding Cubist Principles; In Czechoslovakia and elsewhere" written in *Het Bouwbedrijf* in September 1926, he thinks that it is meaningless to regard art as the new building principle searched during the first quarter of the 20th century and to present as a solution to the ever-existing gap between architecture and art. In his essay written in October 1926 where he complains about architectural innovation to have developed along the decorative direction rather than the constructive one, Doesburg percieves Cubism as a short-lived fashion.

principles of elementarist construction, Giedion relates the genealogy of modern architecture with modern painting, and indirectly with Cubism.

Joan Ockman states that the concept of modern space, which has been fostered by Dorner at the end of 1920s and beginning of 1930s, bears such a similarity that exceeds any coincidence with the modern space conception defined by Giedion in *Space, Time and Architecture* written at the end of 1930s.[402] Giedion's consideration of Cubism as a post-perspectival optic invention also seems to have originated from Dorner. In an article he has written in 1932 on contemporary art, Giedion speaks of the relationship Dorner has established in 1930 among Cubism, Modern architecture and modern physics:

> "At the last International Congress for Aesthetics (Hamburg 1930), Alexander Dorner (Hanover) showed how cubism had achieved a new understanding of space – for the first time since the Renaissance. Instead of the Renaissance perspective with its uni-dimensional depth of field, we now see space as being multidimensional. We have added a fourth dimension, time, to the previous three (length, breadth, depth). Independently of this, modern physics has arrived at similar concept and results."[403]

Based on the same speech Dorner has made, Giedion presents Cubism as an optical revolution in an article written about Picasso in 1932:

> "At the fourth Congress for Aesthetics (Hamburg, 1930), Alexander Dorner (Hanover) demonstrated to the astonishment of his academic colleagues that Cubism—optically speaking— represents the greatest revolution since the Renaissance"[404]

Of the two articles Dorner has written in 1931,[405] the article "Considerations sur la signification de l'art abstrait" published in French in *Cahiers d'Art* must have

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[402] Ockman, "The Road Not Taken," p. 90.

[403] Sigfried Giedion. "Malerei im Zeitganzen" in *Neue Zürcher Zeitung*, no. 1211, (28 May 1932), p. 5. Quoted by Georgiadis, *Sigfried Giedion*, p. 92.

[404] Giedion, "Picasso als Erfinder," *Information* no. 5 (Zurich, 1932); republ. in *Sigfried Giedion: Wege in die Oeffentlichkeit*, Huber, p. 166. Quoted by Ockman, "The Road Not Taken," p. 332, fn. 17.

[405] Alexander Dorner, "Die neue Raumvorstellung in der bildenden Kunst," *Museum der Gegenwart. Zeitschrift der deutschen Museen für neuere Kunst* no. 2 (Berlin, 1931), pp. 30-37 and Alexander Dorner, "Considerations sur la signification de l'art abstrait," *Cahiers d'Art* no. 6 (Paris, 1931), pp. 354-357. Quoted by Ockman, "The Road Not Taken," p. 332, fn. 15.

influenced Giedion in developing his "new space concept." In this article Dorner discusses how the all-sided spatiality provided by the expanding vision in response to overcoming the optic cone of perspective has been adapted to the "new space concept in plastic arts." In layout of the article, Dorner makes use of Pablo Picasso's painting *Head* of 1926 and the aerial photograph of Bauhaus building that looks like an isometric perspective both on the same page, addressing to the idea that there is a relation between modern architecture and Cubism, the same parallelism which Giedion would later construct by using similar images (Figure 4.7). A similar layout has been used by Giedion in the Fourth Chapter "Space-Time in Art, Architecture, and Construction" of his book *Space, Time and Architecture* where he brings together Pablo Picasso's cubist painting *L'Arlésienne* of 1912 with a photography of Lucia Moholy of the glass-walled corner of the workshop wing of the Gropius's Bauhaus building at Dessau in 1926 (Figure 4.8).

In this article Dorner presents the following three analogies, of which it can easily find the traces in Giedion:

> "First, just as the plastic arts had recently moved away from the representation of opaque masses in favor of interpenetrating, massless energies, so the natural sciences had done so some time ago, as exemplified by X-rays. Second, just as painting was now abandoning an absolute, immobile, and perspectival point of view for a mobile and relative one, so science had relinquished belief in an absolute system of relationships, embracing the theory of relativity. Third, just as the 'fourth dimension' of time was now entering into the three-dimensional representation of space, so the continuity of space and time had become the basis for the new physics. Dorner finished by affirming that although the present style of abstract painting was in its superficial aspects only one manifestation of the new spatial conception, it was in its essence a historically necessary phenomenon of greatest consequence."[406]

As manifested here, Dorner has left profound impacts upon Giedion's reception of energies that are visual as much as massless through interpenetrating all as "transparency"; upon his views connecting the post-perspectival view with Relativity Theory as much as with Cubism; and finally, upon his reception of Time as the fourth dimension where he will then, in relation with space, foster his Space-time theory. In

[406] Ockman, "The Road Not Taken," p. 89.

development of Giedion's theory, it appears not only Dorner's ideas, but also the images that have been chosen to exemplify his own point of view have been influential.

Criticizing the theater that still sustains its traditional approach of perspectivalism and frontality, Dorner points out the difference between the innovations in abstract painting began with Cézanne. In addition to this optical inventions and representation of space; the film and the movie screen include movement and time as a technical innovation within.[407] Ockman has referred to Picasso's painting *Head* of 1926 and the composition of Arp as stating that "new representations of objects and new psychic content were combined with many-sided space and a relative point of view" and then points to the Dorner's distinction between film and painting: "But it was film, with its absolute union of space and time, that in Dorner's view corresponded 'better than anything else to our representation of reality.' (…)Yet the movie screen still partook of the frontality and perspectivalism of traditional theater. 'That is why painting and film are developing side by side for the moment, each with its advantage, each with its disadvantage relative to the ideal representation of the desired reality.'"[408]

As the frontal image of Versailles Palace Dorner has chosen to show that visuality is valid not only in painting, but also in photography at the same time implies a perspectival view determined by the horizon line, it represents the static and immobile view. As for Giedion, he envisages Versailles Palace as an appearance of Constituent Fact for reasons of its "close contact with nature" despite the fact that it has emerged under Baroque Absolutism's look of *forcer la nature* (the notion of mastering nature.)[409] In Versailles Palace, "the idea of creating a new mode of life," which has been created owing to its "gigantic scale," "great U-shaped form" and "central block facing the park,"[410] where "great complex buildings for social, residential, and administrative

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[407] Unlike Dorner, Giedion refers to the stage placed at the center of the building in Gropius' *Totaltheater* project as post-perspectivalism: "His *Totaltheater*, for example, is completely adjusted to the new space conceptions. The stage **is no longer a fixed focal point for every perspective** in the body of the theater as it had been since Renaissance and Baroque times. It is placed in the middle of the building and fitted for circular and vertical movement, so that **a many-sided spectacle is presented**." Giedion, S.T.A., p. 497, fn. 12. Emphases are added.

[408] Ockman, "The Road Not Taken," p. 89.

[409] Giedion, S.T.A., pp. 20-21, 138, 140.

[410] Here Giedion implies such constituent facts as "large scale," "curvature form," "close contact with nature," "modern traffic" etc.

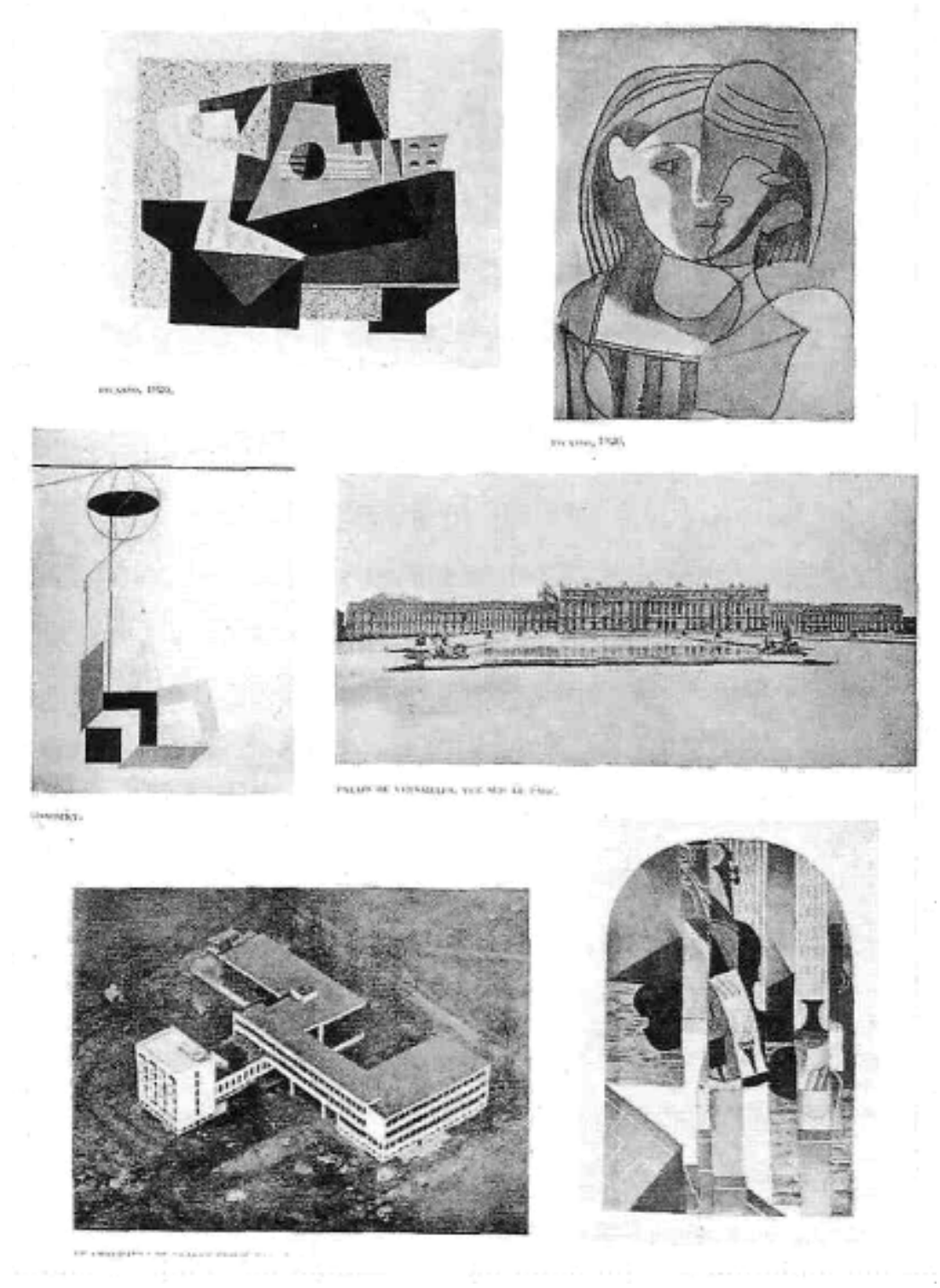

Figure 4.7 Plate from article by Alexander Dorner, "Considirations sur la signification de l'art abstrait," *Cahiers d'art*, (1931). From *Autonomy and Ideology; Positioning An Avant-Garde in America*, Robert Somol, ed., (1997), p. 88.

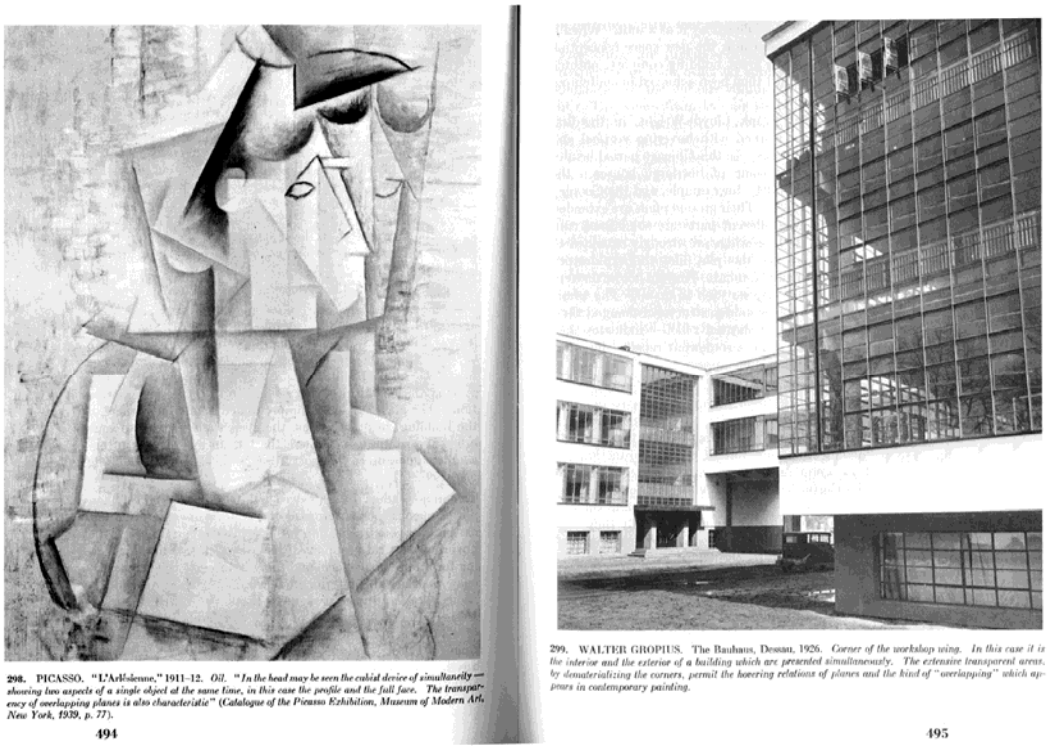

Figure 4.8 Using "simultaneity" for analogical connection between Pablo Picasso's cubist painting *L'Arlésienne* of 1912 and a photograph by Lucia Moholy representing the workshop wing's corner of Walter Gropius's Bauhaus Building at Dessau in 1926. From *S.T.A.*, Sigfried Giedion, (1967 [1941]), pp. 494-495, Fig. 298 and 299.

purposes have been welded together and closely juxtaposed with nature," Giedion emphasizes that "…their gardens incorporated great highways as essential parts of an architectonic expression, and were placed by this means in direct and obvious relation with the unending extension of space"[411] and presents an early example of modern architecture. On the other hand, he claims in the optical sense that the gap formed by the palace garden provides for "a limitless field of vision"[412] of Baroque perspective. He alleges that these gardens are the "models of baroque universe and its aspect of infinity."[413] For a single pointed observation of Baroque perspective, he presents Versailles as a model, just like Dorner has done: "As with many other creations born

[411] Giedion, *S.T.A.*, p. 109.

[412] Giedion, *S.T.A.*, p. 54.

out of the spirit of this age, the meaning and beauty of the parkway cannot be grasped from a single point of observation, as was possible when from a window of the Château of Versailles whose expanse of nature could be embraced in one view."[414] Giedion presents the unrealized League of Nations Palace in Geneva designed by Le Corbusier and Pierre Jeanneret in 1927, as a design beyond Baroque absolutism;

> "The conventionally monumental schemes broke down in another respect. At Versailles, where a great building complex was first juxtaposed to nature, unlimited space was available, and the absolute will behind this endeavor stamped its own imprint upon the surrounding landscape. At Geneva the site was strictly limited. Moreover, in this period we no longer desire to force la nature: we seek to preserve it intact and to bring it and our buildings into harmonious unity."[415]

Apart from this, another photograph represented by Dorner belongs to Walter Gropius's Bauhaus building at Dessau. The Bauhaus building owing to its angle of view close to the axonometric view, its outstanding look ahead of the darkness on the background and flatness of topography creating an implication as if freed from earth, and its compositional form drawn by planes and lines, abandons its perspectivalism to be transformed into a "supraspatial contact": "To understand its character you have to walk around it."[416] Ockman expresses this condition as follows;

> "Near and far objects were now delineated in the same way, and background and foreground entered into a perpetual oscillation. 'The factor of time' thus became an element of the representation of space, and as a corollary all points of view came to be understood as relative. Abstract forms lent themselves most naturally to the representation of this new vision. With the abandonment of the traditional concept of space, the framed view no longer needed to prevail. Another consequence was that matter ceased to be understood as opaque mass. The viewer now envisaged different aspects of space simultaneously, inside and outside, convex and concave at once. Matter was decomposed into simple surfaces and lines (as in Mondrian) or became transparent and interpenetrating (as in Lissitzky).

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[413] Giedion, *S.T.A.*, p. 109.

[414] Giedion, *S.T.A.*, p. 826.

[415] Giedion, *S.T.A.*, p. 535.

[416] Dorner, "Considerations sur la signification de l'art abstrait," pp. 354-357. Cited in Ockman, "The Road Not Taken," p. 89.

> With these developments, space came to be understood as 'a crossing of movements and energies.' Initially, in cubist painting, this supraspatial contact produced a passive sliding from front to back and back to front. With constructivism, it generated an active push, moving toward back and front at once."[417]

Presenting the Bauhaus Building at Dessau by an image from a different angle akin to Dorner's photographic layout, Giedion writes out a caption with a similar expression: "This air view shows how the different units blend together. The eye cannot sum up such a complex at one glance"[418] (Figure 4.9). Apart from that, he claims that the aim of the architect is to separate each function from one another while gathering them all via an "efficient interrelation" without isolating anything. Resembling Dorner, Giedion depicts in compositional expressions the mentioned act of gathering that amounts to a "new organization of volumes" as follows:

> "These cubes are juxtaposed and interrelated. Indeed, they interpenetrate each other so subtly and intimately that the boundaries of the various volumes cannot be sharply picked out. The views from the air show how thoroughly each is blended into a unified composition. The eye cannot sum up this complex at one view; it is necessary to go around it on all sides, to see it from above as well as from below. This means new dimensions for the artistic imagination, an unprecedented many-sidedness."[419]

Philosopher John Dewey defines the basis of Dorner's work *The Way Beyond 'Art'— The Work of Herbert Bayer* published in 1947 as "a search for immutabilities below and behind the changing events of nature and life."[420] Dorner shapes his approach speaking of "The Supraspatial Reality of Pure Energies"[421] within the theoretical framework of

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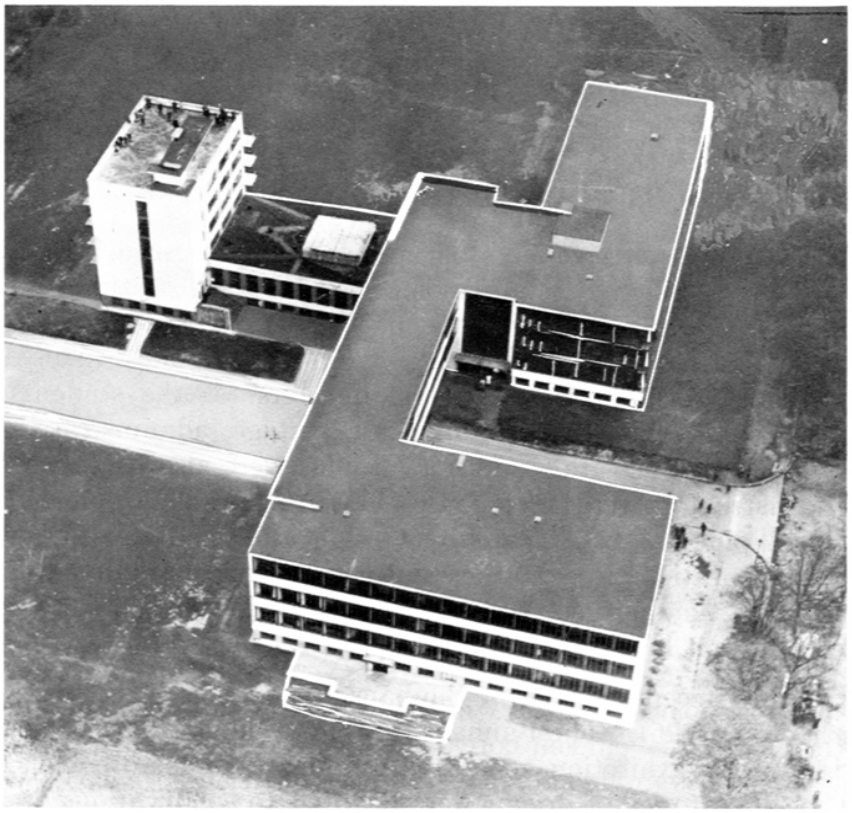
[417] Ockman, "The Road Not Taken," pp. 88-89.

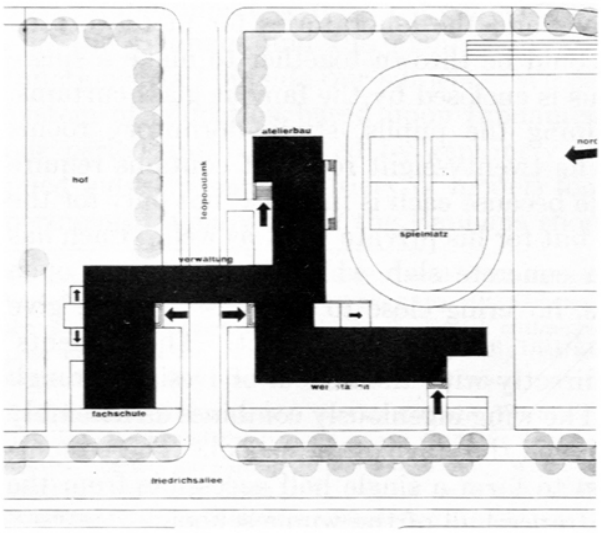
[418] Giedion, *S.T.A.*, p. 492. Caption of Figure 296.

[419] Giedion, *S.T.A.*, p. 497.

[420] John Dewey, "Introduction" in *The Way Beyond 'Art'*, Dorner, pp. 9-11.

[421] Dorner, *The Way Beyond 'Art'*, pp. 103-130.





296. WALTER GROPIUS. The Bauhaus, Dessau, 1926. *Air view. This air view shows how the different units blend together. The eye cannot sum up such a complex at one glance.*

297. WALTER GROPIUS. The Bauhaus, Dessau, 1926. *Plot plan. This complex reaches out over the ground and expands into a kind of pinwheel with three hooked arms.*

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Figure 4.9 The utilization of the dislocating effect of the axonometric projection in aerial photograph of Walter Gropius's Bauhaus Building at Dessau of 1926. Giedion expresses this dislocating effect as, "This complex reaches out **over the ground** and expands into a kind of pinwheel with three hooked arms." Emphases are added. From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), p. 492. Fig. 296 and 297.

the "evolutionism" theory based on "Becoming,"[422] "dynamism," "energy," "self-changing,"[423] which he has fostered under the effect of American Pragmatism, and "transition"[424] that will be influential in his operative understanding of history as well. In context of the "new continuity" understanding he has developed on pure energism and dynamism, Dorner re-conceptualizes "space," "time" and "space-time" as well:

> "We may also say of the history of styles that it lived in a four-dimensional reality, i.e. in a world that was **mobile** but still too narrow —**a world paralyzed by its split character**. What paralyzed it was the continued insistence on eternal basic elements in an eternal human esthetic consciousness, whether these basic elements were called the concept of space or of the picture plane, the eternal essence of Impressionism, *Gestalt*, eternal types, etc. All these concepts were, so to speak, still maintained as spatial forms which now started to curve under the impact of transforming energies. They were, so to speak, ultimate quanta of radiating matter, which served **to construct the floating interpenetrating continuum of the art-**

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[422] Dorner summarizes how Western picture of a three-dimensional reality and its absolute ground originated and how it is dissolved:

"It is only a temporary way of a temporary species of mind to deal with the energies of life. The energies working in man's experience create a constant transformation of his mental powers. This transformation is reflected in the constant growth of man's reality.

Man's past, present and future then are not supported and united by eternal ideas or timeless laws or Adamic mental categories. Such a certainty is not only obsolote but dangerous and deceptive. It chains us to immutable principles and makes us reactionary blocks in a life that is nothing but one tremendous act as ceaseless self transformation. Life is not united statically but energetically, namely by the continous process of interpenetrative transformation of all its energies resulting in an open growth never closed by any tombstone of immutability. Life never repeats itself. It has an overwhelming directing force revealed by evolutionary history. The urge of growth is the real force in our present life. Our new rationality is no longer one of Being but of Becoming." Dorner, *The Way Beyond 'Art'*, p. 144.

[423] "(…) I intended to show that there are much more profound forces of change at work in life, which unite past and present in a much intenser way, than we are accustomed to see. These forces break up any timeless foundation of history. They consist of a never resting interpenetration of energies which results in their constant self-transformation. This wholly relative, wholly dynamic interpenetrative history has a new power to direct us. (…) The more modern man's mind the stronger is his instinct for the strength and direction of the transforming forces. He feels the urge of these forces toward detachment from tradition and visualizes the positive power of growth to replace any identity and to overrule the traditional mind-matter antithesis of Being and Becoming." Dorner, *The Way Beyond 'Art'*, pp. 18-19.

[424] "This transition has shaken all our traditional concepts, especially our concept of the individual. In the individual artist too we no longer find eternal elements. The present becomes a re-formation of the past; the elements of the past live on in it in a new and much more dynamic fashion. In order to understand the present we must link it to the self-transforming urges of the past. We must see it as an evolutionary urge toward a transformation of all traditional notions, as a gradual process of growth in which several earlier currents have penetrated one another and thus have changed their very essence." Dorner, *The Way Beyond 'Art'*, p. 15.

> **historic universe**. They constituted **the unifying and conserving element** in the universe."[425]

According to Dorner, distinct from the Renaissance reception of space that provided for a forerunner of our space notion, space is different from the static and three-dimensionality of the Antiquity and the Medieval.[426] In his opinion, what provided for this difference is the evolution process that parallels the evolutions in modern science: "What is happening in art history is an evolution quite similar to the evolutions in physics, biology, psychology and pragmatist philosophy."[427] With the addition of pragmatist philosophy also to this evolution, Dorner considers it to "bridge" the gap he thinks to exist between humanities and the sciences.

Dorner alleges that the discourses of Fourth-Dimensional Reality and Supraspatial Reality, which he has developed upon pure energies and continual flux, has been "doubtlessly justified" owing to "four-dimensional universe" theories of Planck and Einstein. Exactly similar to Giedion's holistic neo-Kantian view,[428] he hopes for continual flux to provide for the unification of all splitting effect of Modernity: "It was the highest degree of unification available to a split-world. The old irreconcilable poles of Space and Time, Being and Becoming, now divided the realm almost equally." Just as Giedion, Dorner also tries to render the concept he has newly proposed as "autonomous". However, autonomy, in his opinion, converts this into a "self-changing event" by adding emphasis of dynamism as it comprises a static content. Henceforth,

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[425] Dorner, *The Way Beyond 'Art'*, p. 142. Emphases are added.

[426] "Let us take as an example that general 'type,' SPACE. How could we possibly conserve that concept throughout the course of history? We are already stretching it considerably by saying that the three-dimensionality of antiquity and medievalism — though it was not yet space in the Renaissance sense — was a forerunner of our space notion. But that stretching becomes wholly absurd when we attribute to the Egyptians and the prehistoric peoples an eternal concept of the picture plane and proceed to detect in that concept the germ of our own space notion. And how can we possibly reconcile an eternal category of space with the evolution of the last two hundred years, not to speak of the millions of years yet to come?" Dorner, *The Way Beyond 'Art'*, pp. 142-143. Capital is original.

[427] Dorner, *The Way Beyond 'Art'*, p. 143.

[428] Though he does recognize Kantian and Hegelian traditions, Dorner, unlike Giedion, is "anxious to preserve the unity of history statically." His work that was based on dynamism is defined by John Dewey as "organic growth" in Preface of the book. John Dewey, "Preface" in *The Way Beyond 'Art'*, Dorner, pp. 15-19.

Dorner avails the new notion of Time he has proposed to attain a "self-changing" character.[429]

Referring to the evolution of Abstract art via Cézanne's "The Chestnut Avenue in Jas de Bouffan" of 1890, Dorner defines how the contours, lines, the dark and light zones are expanded, the three-dimensional overlapping eliminated simultaneously and freely oscillated in front and back, "becoming engaged in an ever ending open play of autonomous change"[430] (Figure 4.10). He adapts the "self-changing character" of Abstract art onto architectural space by exemplifying from El Lissitzky's work *Abstract Cabinet* accomplished in Hanover Landesmuseum during 1927 (Figure 4.11):

> "The scene was the Room of Abstract Art in Hanover Art Museum. The walls of that room were sheathed with narrow tin strips set at right angles to the wall plane. Since these strips were painted black on one side, gray on the other, and white on the edge, **the wall changed its character with every move of spectator**. The sequence of tones varied in different parts of the room. This construction thus established a suprasptial milieu for the frameless composition. This **visual mobility** was futher increased by placing a sculpture by Archipenko in front of a mirror. The mirror reflected the reversed side of the metal strips, not the side seen by the spectator. Thus the mirror effect extended the elusive wall construction in such a way that construction changed its identity."[431]

Just as in later times Le Corbusier will try in Villas La Roche-Jeanneret at Paris-Auteuil in 1923, Dorner not only transforms, with the help of El Lissitzky's *Abstract Cabinet*, the relationship among spectator-painting-architectural space, but in context of

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[429] "Time now became the overlord of the universe, but it was no longer the old uniform Time, that helpless twin of absolute Space, which could not touch the eternal basic form or could only rearrange the never-chaging basic elements inside of Space; now it was a new active Time consisting of the irreversible, purely energetic processes that transformed the very essence of those elements. Thus time new species of **self-changing** Time had the strength to subdue the traditional ruler of Western civilization, the 'being' extension." Dorner, *The Way Beyond 'Art'*, p. 104. Emphasis is added.

[430] "It is a binding force of pure energy whose strength no longer lies in absolute rigidity but in self-changeability. Such is the new unity Cézanne achieved in his compositions.

Thus, at the very beginning of the Abstract evolution we are confronted with a concept of reality which represents the *Spontaneous Act of Autonomous Change*." Dorner, *The Way Beyond 'Art'*, pp. 109-110. Italics are original.

[431] Dorner, *The Way Beyond 'Art'*, p. 114. Emphases are added. In the unnumbered footnote, he additionally states: "This feature is indeed a true symbol of the new concept of CONTINUITY AS SELF-TRANSFORMATION. In contrast the mirror effect of the Baroque created a balancing replica of a static space arrangement." Dorner, *The Way Beyond 'Art'*, p. 114. Capitals are original.

post-perspectivalism, also turns space itself into a spectacle[432] (Figure 4.12, 4.13, 4.14, and 4.15).

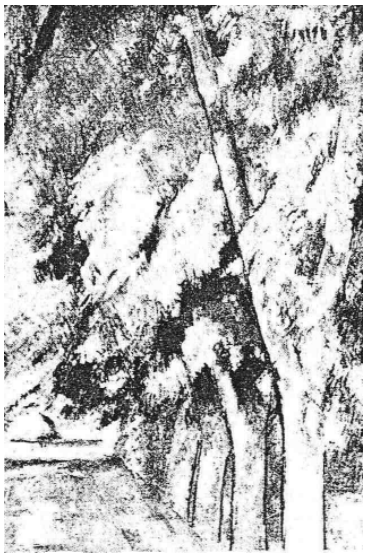


Figure 4.10 Detail of Paul Cézanne's painting "The Chestnut Avenue in Jas de Bouffan" ca. 1890. From *The Way Beyond 'Art'*, Alexander Dorner, (1958 [1947]), p. 108.

[432] Relating Le Corbusier's Villas La Roche-Jeanneret with Cubism and movement, Beatriz Colomina analyses the transformation of observer's view frame via the transformation of the relationship among spectator-painting-architectural space: "If Jeanneret and Ozenfant modernize the frame, the La Roche house is used to reframe cubism." Considering this building in particular, Colomina points to the problematic where painting and architectural space turns out to be competitors in becoming spectacle: "A house or an exhibit, an archive or a library, an art gallery or a museum?" Colomina, *ibid*, p. 156.

Tim Benton also emphasizes on the problematics of the storage and the exhibition of the paintings in a domestic sphere; "The question of lighting the gallery was taken up again in 1928, as were three other features of this space, (…). One of these features concerned the key question of the storage of paintings. A serious conflict arose between the functions of picture storage and display and the unencumbered role of the wall surfaces as purveyors of architectural values. This was a particularly personal question for Le Corbusier, who had played an important role in buying paintings for La Roche and whose own paintings were also included, along with Ozenfant's, in the collection. Indeed the photographs of the interior taken in 1925 and 1926 show a hanging policy which must be seen as an extension of the arguments of *La Peinture Moderns* (published as articles in *L'Esprit Nouveau* and as a book in 1925). The objective of these articles was to prove that the Purist canvases (and supporting theory) formed a natural sequel and criticism of Cubism.

(...) There are two issues here, the relative importance to be given to different Purist paintings and other works and the density of hanging. Photographs taken in 1925, and those taken by Fred Boissonas in 1926 show that Ozenfant had his way on the former debate. In the gallery, key works of analytic and 'crystal' Cubism by Picasso, Braque, Leger, Gris and Lipchitz were confronted with the Ozenfants and Jeannerets. In La Roche's bedroom, austere as a monk's cell, only Purist paintings were allowed. Although Le Corbusier must have approved this layout, with its implied progression, reflecting closely the layout of illustrations in the final chapters of *La Peinture Moderne,* he fell out with Ozenfant over the density of the hanging. This dispute was in part a symptom of and in part a contributing factor in the break-up of the friendship of the two men. It marks the point in Le Corbusier's career when, despite his continuing and indefatigable practice as a painter, he decided to prioritise architecture, and architectural values, over those of painting." Tim Benton, *The Villas of Le Corbusier 1920-1930* (New Haven: Yale Uni. Pr., 1990 [1984]), pp. 67, 70.

In his book *Space, Time and Architecture,* Giedion does not apply his attitude of giving references he used to in writing his articles in 1932 and in result, there exists no references given for Dorner in the book.[433] Unlike the attitude in essays of his early periods, Giedion does refer in any edition of his book to neither the name, nor the essays (in terms of articles and books) of Dorner, who, as an émigré to America in 1938, has been theoretically influential in the development of modern space conception. Dorner blames Giedion of plagiarism in the letter he has written to Wilhelm Valentiner in 1943, stating: "I must say I am ashamed for Giedion at the way he... has used... my various essays."[434]

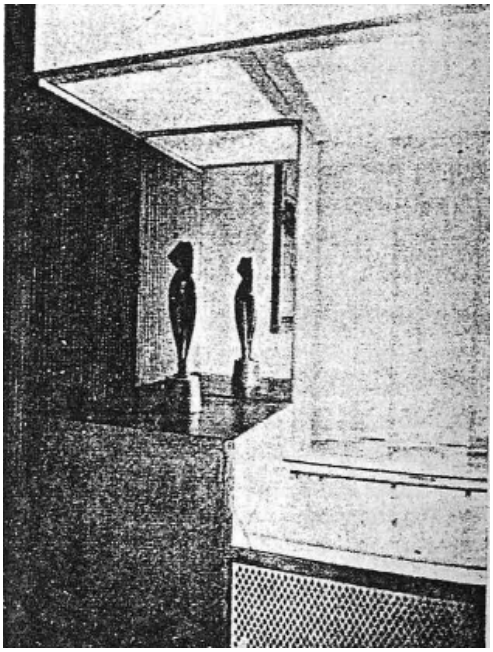
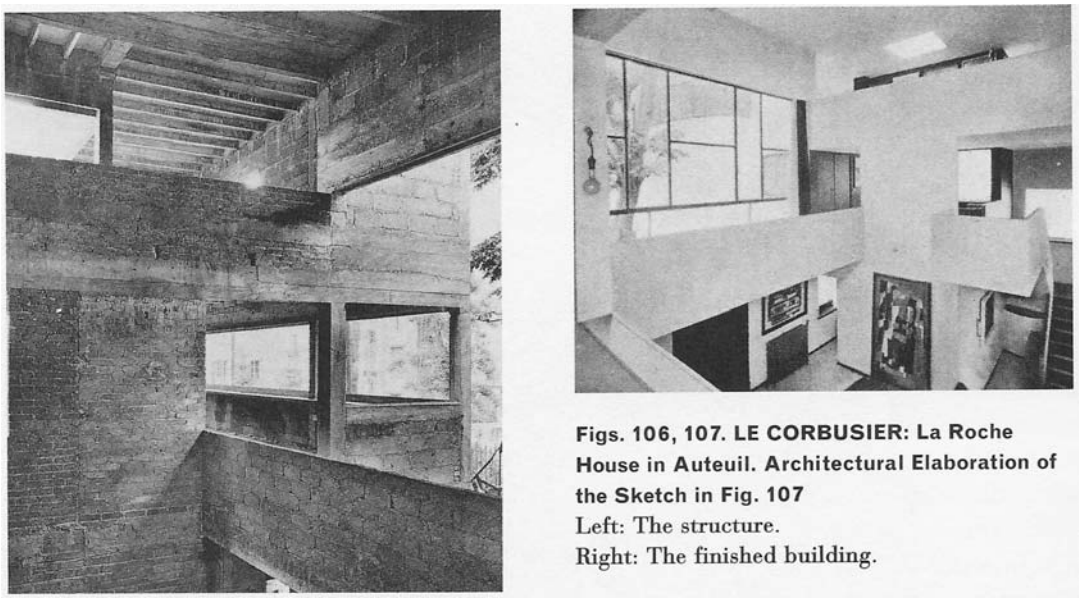


Figure 4.11 A sculpture of Archipenko in front of a mirror in El Lissitzky's *Abstract Cabinet* in Hanover Landesmuseum. From *The Way Beyond 'Art'*, Alexander Dorner, (1958 [1947]), p. 115.

[433] Different from the previous book named as *Bauen in Frankreich, Bauen in Eisen, Bauen in Eisenbeton* he puts the reason of not using bibliographical reference in *Foreword to the First Edition* of *Space, Time and Architecture*: "In keeping with this approach, the bibliographical apparatus has been reduced to a minimum. For those **interested in further study and research in the subject, the necessary information is given in footnotes.** No general bibliography has been provided. Its addition, in view of the theme and design of the book , would simply have swollen the volume by some fifty extra pages without at the same time affording scientific completeness." Giedion, *S.T.A.*, pp. vi-vii. Emphases are added.

[434] Monike Flacke-Knoch, *Museumskonzeptionen in der Weimarer Republik. Die Tätigkeit Alexander Dorners im Provinzial-museum Hanover* (Marburg: Jonas Verlag, 1985), p. 191. Cf. statement by Valentiner published in Samuel Cauman, *The Living Museum: Experiences of an Art Historian and*



Figs. 106, 107. LE CORBUSIER: La Roche House in Auteuil. Architectural Elaboration of the Sketch in Fig. 107
Left: The structure.
Right: The finished building.

Figure 4.12 Villa La Roche-Jeanneret in Auteuil, Paris, 1924, architect Le Corbusier. From *B.F.B.I.B.F.*, Sigfried Giedion, (1995 [1928]), p. 178.

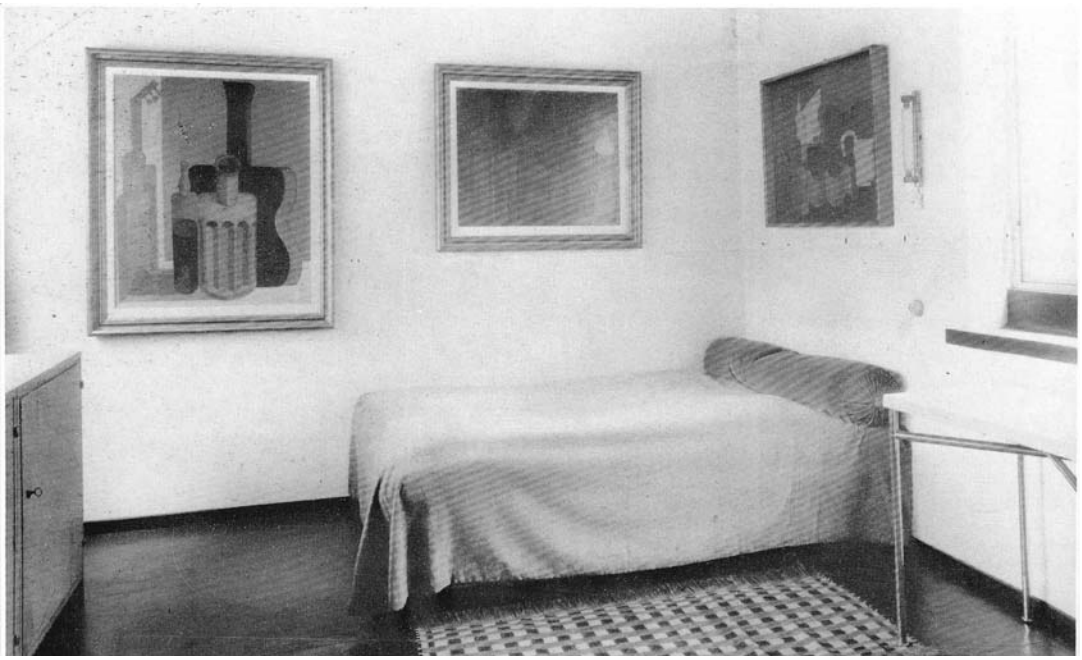


Figure 4.13 La Roche's bedroom with the Purist paintings by Le Corbusier and Ozenfant. Villa La Roche-Jeanneret in Auteuil, Paris, 1924, architect Le Corbusier. From *The Villas of Le Corbusier 1920-1930*, Tim Benton, (1987), p. 74.

Museum Director-Alexander Dorner (New York: New York Uni. Press, 1958), p. 106. Quoted by Ockman, "The Road Not Taken," p. 90, fn. 18.

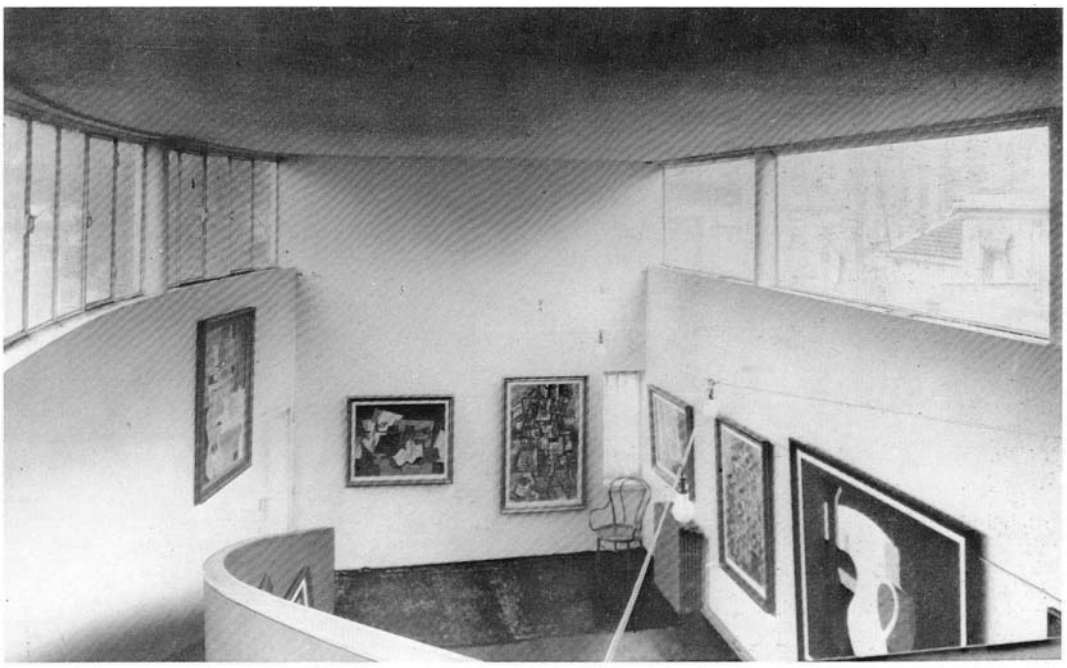


Figure 4.14 La Roche picture gallery, taken in 1926. Villa La Roche-Jeanneret in Auteuil, Paris, 1924, architect Le Corbusier. From *The Villas of Le Corbusier 1920-1930*, Tim Benton, (1987), p. 75.

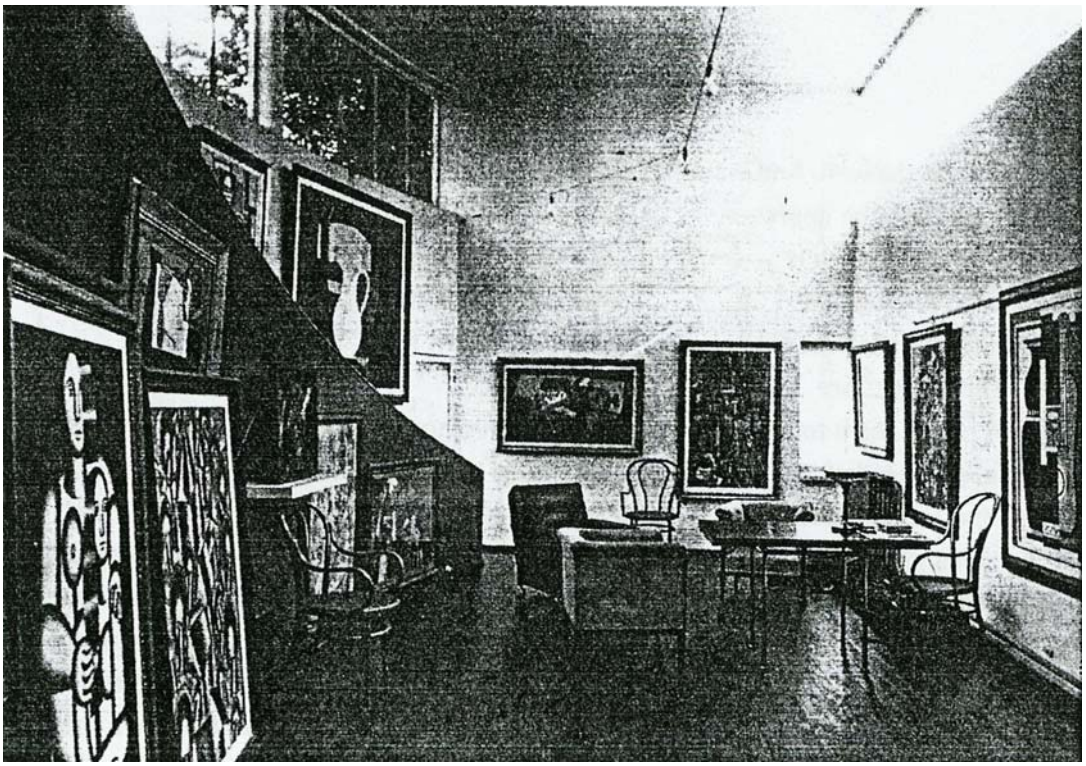


Figure 4.15 Gallery with the cubist collection of La Roche in 1926-1928. Villa La Roche-Jeanneret in Auteuil, Paris, 1924, architect Le Corbusier. From *Le Corbusier, Architect of the Century*, Le Corbusier, (1987), p. 146.

With the publication of Dorner's book *The Way Beyond "Art'—The Work of Herbert Bayer* in 1947, the tension that reveals the difference between Giedion and Dorner also rises. Allusively, Dorner finds Giedion's evaluation adopting an absolustic view as "style" and "ultimate form" of Bauhaus, deceived:

> "Designing becomes a process of transformation. Nothing could be more misleading than to speak of a functional 'style' which is supposed to have received its ultimate form in the Bauhaus, or to speak of the '**growth of a new tradition**.' Such analyses of the Bauhaus movement are characteristic of an art philosophy still thinking in terms of eternal human faculties and of 'basic elements of designing' which are now said to have rearranged themselves into a **new 'timeless' style**."[435]

Blaming Giedion directly, referring his name for "preserving timeless elements in a world of change," Dorner repeatedly indicates that his semi-static philosophy produces the "new style":

> "(…) Fundamentally Borromini and Tatlin, Turner and Paxton, the Surrealistic Picasso and the stroboscopic photographer, Leibniz, Newton and Einstein, Plato and Dewey all work with the same timeless human concepts. What else can modern art and architecture become under these circumstances but a new arrangement of basic elements, i.e. a 'new style' — or as Giedion calls it, 'a new tradition.'…" [436]

[435] Dorner, *The Way Beyond 'Art'*, p. 129. Emphases are added.

[436] Dorner, *The Way Beyond 'Art'*, p. 145. Unnumbered fn.

4. 2 Surveying the *Space-time* Conception; Construction of the Plural Meanings of *Space-time* Conception

The most important factor in transplantation and spreading of the notion of Time within the architectural theory has been Giedion's book *Space, Time and Architecture*. In his latter books, Giedion does not prefer to use the Space-time concept he has constructed as a tool to describe and embody "modern space" that he sees as the new space conception[437] (Figure 4.16). However, to the extent that Space-time construction,

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[437] For instance, in his book to follow, *Mechanization Takes Commands*, Space-time is used for once:

> "It is but a step from the suspended hammock, ever ready to change equilibrium, to the art of the American sculptor Alexander Calder. A draft of air, a push of the hand will change the poise of the mobile's hanging elements connected in a mobile wire system, whose interrelations form ever-varied, unpredictable complexes seen in a **space-time aspect**." Giedion, *M.T.C.*, p. 479. Caption of Figure 308. Emphasis is added.

Georgiadis explains the reason why he does not use Space-time and why he refers to Werner Heisenberg instead of Einstein, both via "insecurity":

> "...In *Mechanization Takes Command,* another way announces itself: 'space-time' is only expressly mentioned once, and that is in connection with a hammock and deckchair, both examples of modern seating comfort on the one hand and the mobile constructions of Alexander Calder on the other. Here, the problem of mastering movement is of central importance.
>
> The first section of Part II of the book is also dedicated to this question in which the historical development of the concept of movement is studied from antiquity up to the present: through mechanization, mankind manages to master movement.
>
> **The 'new concept of space' or the 'new optical vision', which are not specifically termed 'space-time' concepts, are mentioned several times in the book**, especially when the subject under discussion is the representative furniture of the twentieth century. Tubular steel furniture is described as possessing an 'airy lightness' and 'transparency' — both characteristics of the 'new spatial conception of our time.'
>
> (…) 'Modern science no longer recognises the distinction between objects that are independent of the intellect, and an intellect that is independent of objects. Modern physics considers experiment and experimenter to be mutually dependent.' Rather than referring to Einstein, Giedion now refers to Werner Heisenberg. So what does this mean in light of Giedion's early ideas?
>
> Giedion's statements from 1947 represent a volte-face on his part, in that the earlier emphasis on the 'realm of the extra-human' was shifted towards the realm of the inner-human, the subconscious, or the 'immutable elements of human nature', as he later called them in his work *The Eternal Present*. **All this should not be taken to mean that Giedion completely abandoned the 'space-time concept'**. What could be described as a volte-face in terms or philosophy transpired to be nothing more than a shift in emphasis in the discussion of architecture (especially concerning questions of aesthetics), more **a matter of being insecure concerning the fate of the 'space-time concept'**. This insecurity is frequently quite marked, but on occasion dissolves into what he was later to call the 'third space-time concept', appearing in its fully-developed form in *The Eternal Present. Mechanization Takes Command,* provided the first signs of this development." Georgiadis, *Sigfried Giedion*, pp. 165-166. Emphases are added.

Giedion clarifies the condition of "insecurity" in his essay "Transparency: Primitive and Modern" written in *Art News* in 1952:

designed as an instrument in which the meaning becomes ambiguous in order to emphasize the different characteristics, and attains a structure that is flexible and comprises multiple meanings. In order to emphasize the free structure of modern space that is said to be "melting in the air," Giedion successfully benefits from the plurality of ambiguous meanings of Space-time. Hence, including multiple meanings that could be contradictory with one another, the concept of Space-time begins to possess multiple meanings and thus becomes instrumentalized. The concept begins to attain new meanings concerning the context used instrumentally. There exists two underlying reasons: on the one hand that Giedion makes misleading use of the concept with regard to the superficial and insufficient explanations he has learned from different resources, and on the other that, he has turned *Space, Time and Architecture* into "Living History" by editing it for five times from 1941 until 1967.[438] In addition to these by virtue of his "intimate" operative[439] historiography, that he fills the narration with different contents,

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"We are **at the end of mechanistic conceptions**: from physics to psychology, from conceptions of inanimate matter to conceptions of the human body.

We have recognized again that, since man reached his full stature during the prehistoric period, the human organism has changed but little. We have again become interested *in the continuity of human experience.*

As a result of **our own bitter experiences**, we want to know what is constant and what is changeable in human nature; what can be suppressed and what *cannot* be suppressed in man's emotional equipment. **We need to go to the source**, to the origin, to the first symbolic expression of human emotions. Any single period can only be regarded as a fragment, broken off from a greater continuity.

What relates the man of today with the past?

The past is not static but perpetually moving with the changing viewpoint of the changing generations. To ascertain what is close to the emotional life of the man of today and what is strange to him in certain historical periods discloses more than superficial features. To discover the affinities—also the oppositions; but particularly, the affinities—between one period, and another is to reveal certain essential features. Not only this. The expression of certain cotemporary aims or desires appears to us as isolated fragments, seen by the light of a small flashlight; but the revelation of the past throws a broad beam of light along the whole gallery, and the modern examples can then be seen to form part of a greater continuity." Sigfried Giedion, "Transparency: Primitive and Modern", *Art News*, vol. 51, no. 4, (Summer 1952), pp. 47-50, 92-96. Italics are original. Emphases are added.

[438] The editions of the book have taken place in years 1941, 1949, 1954, 1962, and 1967. Owing to the additions made for each edition, the book has gone through a serious transformation.

[439] Mark Wigley, not only indicates that the *Operative Criticism* of Manfredo Tafuri has been misunderstood, but also points to Tafuri's insufficiency in interpretation of Giedion:

"It is crucial to remove the most common misunderstanding by pointing out that Tafuri was never against operative criticism per se. He simply tries to define a different mode of operation. From the beginning, he repeatedly insists that the problem with writers like Giedion and Zevi is not the operative nature of their work but the failure of the operation. Their attempt to cover over historical heterogeneity ultimately fails to constrain the heterogeneity of the present. Time after time, Tafuri quietly but unambiguously warns in asides that the operative critics are not guilty of any crime, their work being 'not necessarily harmful or incorrect,' and leaves hints that operative criticism 'may still

meanings and expectations, in other words reconceptualizing the concept differently in each edition.

Apart from the 19-times used "Space-time" concept in his book *Space, Time and Architecture*,[440] Giedion makes use of the expression of "space and time" for 6 times and "fourth dimension" for 2 times. Owing to parallelism to the analogical and allusive techniques of narrative, Giedion uses the concept of Time in a comprehensive manner as to involve the meanings of movement, simultaneity, speed, moment, temporality, clock, duration, *durée*…etc., apart from the other meanings as period, epoch, *Zeitgeist*, Past, Present, Future, History…etc. In addition to such a flexible use of content of "Space," "Time" and "Space-time," Giedion sustains the very same approach while assembling and building the genealogy of Space-time conception he has constructed. In the book, the primary reason for development of the new space conception in Europe[441]

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have many useful applications.' Indeed, it has to be deployed by the vigilant scholar rather than simply abandoned. Operative criticism is dangerous but 'a road which nonetheless one cannot avoid following.'

Those who smugly rush to condemn research that they see as unacceptably operative, while ignoring their own operative use of Tafuri himself, might well consider some of the deeper similarities between Tafuri and the operatives he challenges before celebrating the differences. It is symptomatic, for example, that when Tafuri nominates Giedion as the exemplar of the operative critic he does not acknowledge, let alone analyze, Giedion's methodological self-defense. It remains an astonishing fact that the reader of *Space, Time and Architecture* — the standard teaching guide for generations of architects — is required to go through a substantial discussion of historiographic method before proceeding to the main text. Giedion begins with a miniature history of his way of doing history. He insists on his operative function, declaring in a Nietzchean spirit that the historian must be an agent of the present whose work necessarily reshapes the past: 'the backward look transforms its object; History cannot be touched without changing it.' He is not a covert operative. Indeed, there is an intimate relationship between Giedion's argument that there is no fixed point of reference for the historian and that historical objects are actively transformed by the act of perceiving them, and his account of the new active mode of perception that characterizes modern space. Modern architecture is even more tightly bound to modern historiography than Tafuri suggests." Mark Wigley, "Post-Operative History," in "Being Tafuri" *ANY*, nos. 25-26, (2000), p. 50.

"We cannot pass abstract judgment on operative criticism. **We can only judge it after we have examined its historical origins and measured its effects on contemporary architecture**: no other yardstick will do." Tafuri, *ibid*, p. 141. Emphases are added.

"The subject having been split from its object by the logic of social and technical development, the object must now be reconstructed by Giedion in such a way as to bear the place of the subject within itself. 'lo spettatore nel centro del quadro' was how Giedion put it. And here, once again, is **the conjunction of criticism and design too easily dismissed by Tafuri as 'operative.'**" Hays, *ibid*, p. 18. Emphases are added.

[440] This study is based on Sigfried Giedion's *Space, Time and Arcitecture; The Growth of a New Tradition,* (Cambridge, Mass.; Harvard University Press, 1967 [1941]) U.S. Edition in 1976 as the Sixth Printing.

[441] Despite the fact that he sees F. L. Wright as one of the forerunners of new space conception, Giedion denotes that it is different from the channel opened by painters in Europe due to its "organic architecture" that bears impacts of the traditional American House and involves ornamentation:

has been denoted as the novelty of viewpoint of Cubist and Futurist artists and their forerunner Cezanné, breaking the cone of perspective and as the entailed notion of movement between the subject-object relationship.

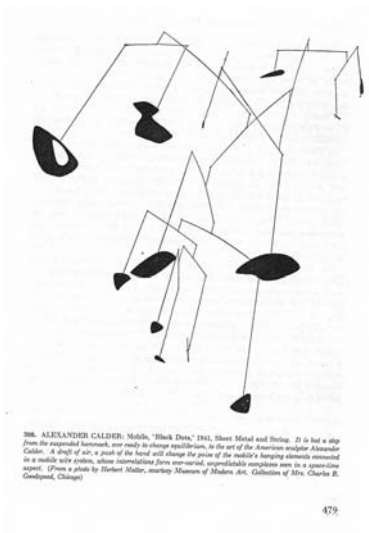

Figure 4.16 Space-time aspect in Alexander Calder's mobile "Black Dots" sculpture of 1941. Giedion describes unpredictable and ever-varied interrelations of space-time as, "It is but a step from the suspended hammock, ever ready to change equilibrium, to the art of the American sculptor Alexander Calder. A draft of air, a push of the hand will change the poise of the mobile's hanging elements connected in a mobile wire system, whose interrelations from ever-varied, unpredictable complexes seen in a space-time aspect." From *Mechanization Takes Command*, Sigfried Giedion, (1955 [1948]), p. 479. Fig. 308.

"These houses are a pure artistic expression which is deeply connected with the anonymous aims of their period. This handling is not without relation to what was being explored at that time in space conceptions in France.

(…) To use plane surfaces, on the one hand, and to give them force and expression by the frank use of undisguised materials, on the other, is to employ, as we shall soon see, one of the means of painting, which at this time in France was opening the way for our new spatial conceptions.

Wright had around him no painters and sculptors who were inspired by the same spirit. He was one of those rare exceptions, the architect who is in advance of the contemporary painter in his optical vision. In Europe, where the new spatial conceptions flowered about 1910, the case was just the opposite; there the painter showed the way. But Wright had to do his work alone, design his own stained-glass windows, architectural details, and pictorial ornamentation.

(…) He is impelled unconsciously by the same forces that worked in Europe about ten years later; there, however, the concern was to explore new penetrations of inner and outer space rather than, as with Wright, to treat the house as an enclosed spatial unit.

Wright often used the same elements as the Dutch architects of the 'Stijl' group, Mondrian and Doesburg, or the Russian constructivists like Malewitsch — for example, the abstract quadrangle, which remains the hallmark of Wright's work. Malewitsch, however, used it as an absolute form, as a protest against academic *trompe l'œil.* The Dutch organized geometrical forms not for ornamentation but for the expression of pure and undisguised interrelations between surfaces and colors. Behind the European research lies, to a certain extent, another will and another spatial conception." Giedion, *S.T.A.*, pp. 410-411, 413.

Giedion interprets this structure of non-perspectival view that necessitates constant displacement and movement of the spectator, as relativity and constructs parallelism with Einstein's General Theory of Relativity. On the other hand, due to physiognomic approach implied by education in history of art, he also does not hesitate to construct parallelism between the higher reality,[442] which he regards as the origin of forms in Picasso's paintings, and constructor Robert Maillart's form of bridges (Figure 4.17).

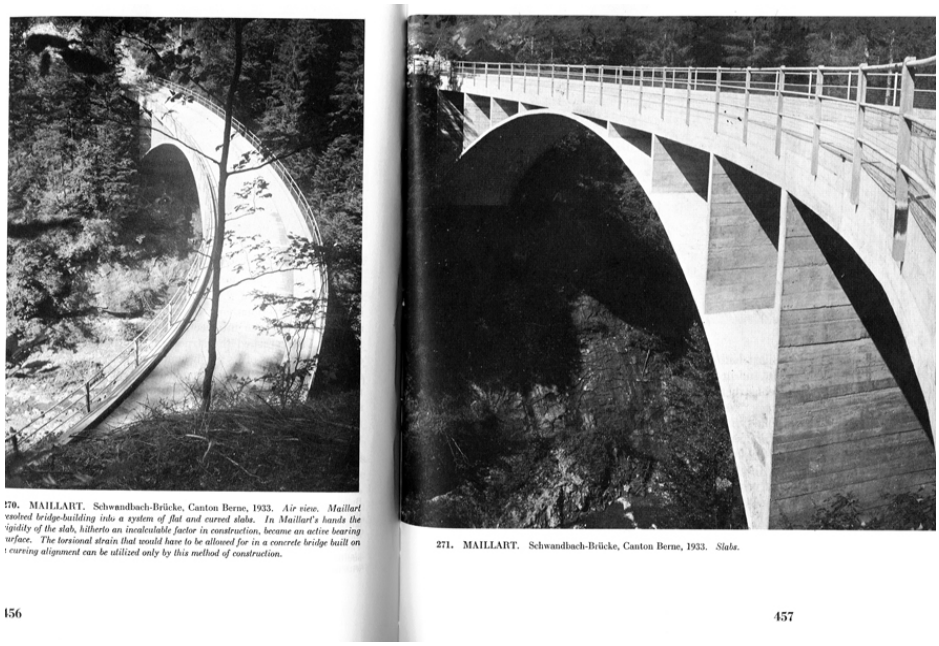

Figure 4.17 Two photograph of the Schwandbach Bridge in Canton Berne, Switzerland, 1933. Giving this bridge as an example of the flat and curved slab system, Giedion characterizes it as "an active bearing surface." From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), pp. 456-457.

Becoming widespread since the 18th century, the reception of time concept as a fourth dimension seems to have been continued in Giedion's mentality as well. In

[442] "When Picasso paints half-geometric, half-organic plastic images on canvas — forms which in spite of their apparently capricious projection somehow achieve a singular degree of equipoise — and the constructor [Maillart] (proceeding from purely technical premises) arrives at **similar absolute forms** by substituting two vertical supports for four, there is a clear inference that mechanical shapes and the shapes evolved by art as **the mirror of a higher reality** rank *pari passu* in terms of development." Giedion, *S.T.A.*, pp. 461-462. Emphases are added.

addition to these plural meanings of the time conception, in accordance to *Telos* of "Universal Unity" and "Unified Culture," Giedion renders it parallel to Minkowski's *Space-Time Continuum* theory for only similarity of words and adapts "space" and "time" to architecture by unifying them as "Space-time." Thus, in order to encounter this aim adopted, Giedion instrumentalizes the concept of Space-time in four different ways as:

- To describe the characteristics of "New Space Conception,"
- To define the new mode of the visual perception of modern subject and its dynamic experience under the effect of changing subject-object relationship,
- To construct analogies, parallelisms and allusions between science and art to justify the "New Space Conception" as a means of *Zeitgeist*,
- To represent the new dynamics of Modernity and the characteristics of Modern Life.

4.2.1 *Space-Time* as an Instrument for the Opportunity to Describe the Characteristics of "New Space Conception"

In the Introduction part "Architecture in the 1960s: Hopes and Fears" of the 1967 edition, Giedion reveals the final content of the Space-time concept at the beginning of his book:

> "It has in common a space conception, which is as much a part of its emotional as of its spiritual attitude. It is not the independent unrelated form that is the goal of architecture today but the organization of forms in space: space conception. This has been true for all creative periods, including the present. **The present space-time conception — the way volumes are placed in space and relate to one another, the way interior space is separated from exterior space or is perforated by it to bring about an interpenetration** — is a universal attribute which is at the basis of all contemporary architecture."[443]

The concept of interpenetration (*Durchdringung*), which he has treated in his previous book *B.F.B.I.B.F.* published in 1928, becomes the basic characteristic of

modern space conception, or Space-time in this book. As can be depicted in this definition, the concept of Space-time bears a dichotomic structure; it comprises the acts of togetherness and separation by drawing a boundary at the same time. By this way, just as in all avant-garde discourses, this definition of Giedion covers as a promise for freedom as long as it proposes a system simultaneously. The actual goal of interpenetration proposed in between the interior and exterior spaces is to alienate the object/space/view and to render them unfamiliar by eliminating their conventional meaning; thus to produce the "new." Giedion presents the many-sided view of Cubism with Le Corbusier's interpenetration in *Five Points* both as the new alienation techniques to constitute the "New Space Conception":

> "*Le plan libre.* Le Corbusier converted the ferroconcrete skeleton from a technical device into an aesthetic means. Le Corbusier used the partition walls to model the interior space of the house in the most varied manner, employing curved staircases and curving or flat partition walls for both functional and expressive purposes. The same means allowed him to hollow out large portions of the house, and to bring about **interpenetrations** of outer and inner space which are **unfamiliar** and daring.
>
> This whole treatment, the completely free and individualized organization of separate stories, is what is meant by 'open planning' or *le plan libre.* By now the difference between the open planning of Frank Lloyd Wright and that of European architects should be apparent. The work of the latter was based upon the **new conception of space as essentially many-sided** which grew out of cubism."[444]

He constructs Space-time that he regards as the "New Space Conception" upon visual perception of space and its dynamic experience. In a caption of the photograph for Eiffel Tower, which he considers as one of the best examples through which the concept of interpenetration can be read, he presents the characteristics of the building as an a new spatial experience and adapts these characteristics to the beholder who is to perceive the building (Figures 4.18 and 4.19). The instrument he makes use of here is the many-sidedness which provides the novelty of viewpoint in Cubism:

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[443] Giedion, *S.T.A.*, p. xxxvii. Emphases are added.

[444] Giedion, *S.T.A.*, pp. 524-525. Italics are original. Emphases are added.

> "Ever-changing viewpoints and interpenetration of inner and outer space were **experienced** here architects or painters realized the new conception of space."[445]

In order to affirm the temporal and dynamic structure of Modernity and construct the "new," he converts the one-point perspective that is thought not to be sufficient to reflect the many-sidedness of "Reality" as much as Renaissance renders the subject as static, using the characteristic of "invented tradition"[446] as the imaginary anti-thesis of dialectic.

With regard to his understanding of history based on Hegelian *Zeitgeist*, Giedion periodizes history to the extent that he homogenizes it. He thinks that the "Reality" adopted by previous periods appears to be invalid for the "Modern" period defined by him as dynamic, splitted, fragmentary, and even chaotic. According to him, the reality of Modernity is composed by the togetherness of fragments. Giedion justifies this "fragmentary Totality" through Cubism's perception of multiple views and its facetness as the representation of this multiplicity of Reality on pictorial space:

> "A building complex is evolved which goes beyond Renaissance conceptions of space and **cannot be grasped by a view from any one point**. In its **entirety** the [League of Nations] Palace realizes **the new conception of space-time**."[447]

> "Thus in the Renaissance the dominant space conceptions found their proper frame in perspective, while in our period the conception of space-time leads the artist to adopt very different means."[448]

The fact that the utilization of new methods and materials in construction primarily of large scale public buildings become widespread also in domestic buildings at the end of the 19th century is indeed a development in Giedion's opinion. Considering Le

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[445] Giedion, *S.T.A.*, p. 286. Caption of Fig. 171. Emphasis is added.

[446] For Modernity's praxis for production of "Invented Tradition" see also, Eric Hobsbawm and Terence Ranger, eds., *The Invention of Tradition*, (Cambridge: Cambridge Uni. Press, 1983) and Uğur Tanyeli, "Bir Historiografik Model Olarak Gerileme-Çöküş ve Osmanlı Mimarlığı Tarihi," in *Osmanlı Mimarlığının 700 Yılı; "Uluslarüstü Bir Miras*," Nur Akın, Afife Batur, Selçuk Batur, eds., (Istanbul: Yapı Endüstri Merkezi Yay., 2000), pp. 43-49.

[447] Giedion, *S.T.A.*, p. 536. Emphases are added.

[448] Giedion, *S.T.A.*, p. 16.

Corbusier's Villa Savoye as an adaptation of the skeleton construction system to domestic buildings, Giedion deems it as one of the paradigmatic implementations of Space-time, i.e., Modern architecture. In this way the Space-time concept begins to encompass a normative usage of skeleton construction and its expression:

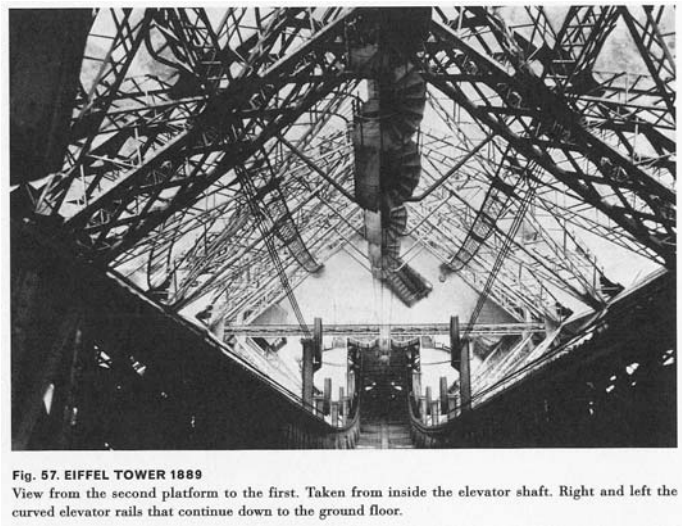

Fig. 57. EIFFEL TOWER 1889
View from the second platform to the first. Taken from inside the elevator shaft. Right and left the curved elevator rails that continue down to the ground floor.

Figure 4.18 Giedion's photograph within the Eiffel Tower, Paris, 1889, constructor Gustave Eiffel. From *B.F.B.I.B.F.*, Sigfried Giedion, (1995 [1928]), p. 144.

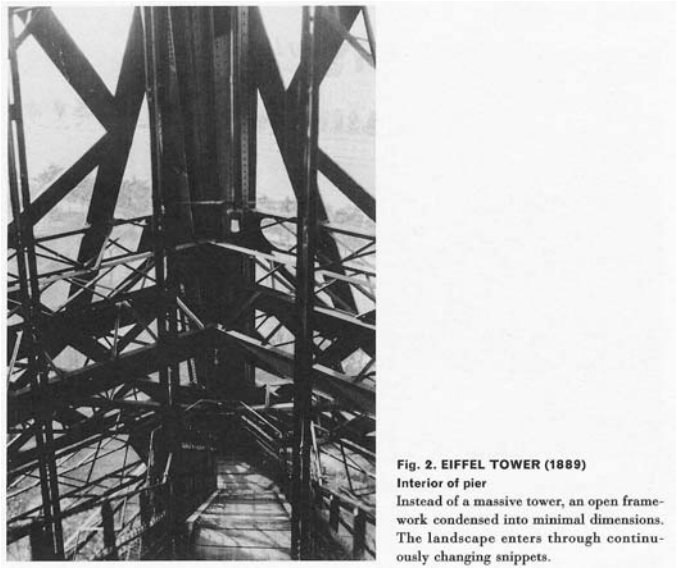

Fig. 2. EIFFEL TOWER (1889)
Interior of pier
Instead of a massive tower, an open framework condensed into minimal dimensions. The landscape enters through continuously changing snippets.

Figure 4.19 Giedion's photograph within the Eiffel Tower, Paris, 1889, constructor Gustave Eiffel. Giedion's caption reads "Instead of a massive tower, an open framework condensed into minimal dimensions. The landscape enters through continously changing snippets." From *B.F.B.I.B.F.*, Sigfried Giedion, (1995 [1928]), p. 91.

> "**It is impossible to comprehend the Savoie house by a view from a single point**; quite literally, it is **a construction in space-time. The body of the house has been hollowed out in every direction**: from above and below, within and without. A cross section at any point shows inner and outer space penetrating each other inextricably.
>
> Borromini had been on the verge of achieving the interpenetration of inner and outer space in some of his late baroque churches. This interpenetration was first realized in our period, through **the methods of modern engineering**, with the Eiffel Tower of 1889. Then, in the late twenties, it became possible **to achieve it in a dwelling**. This possibility was latent in **the skeleton system of construction, but the skeleton had to be used as Le Corbusier used it: in the service of a new conception of space**. That is what he meant when he defined architecture as *construction spirituelle*."[449]

Giedion begins to address additional characteristics to Space-time that he defines by interpenetration at the beginning of his book. He formulates his Hegelian and linear narrative of History within a dual structure as continuity and discontinuity: *Constituent Facts* that provide for continuity and *Transitory Facts,* which, as the cause of discontinuity, possess a negative tone lacking of *Telos* of the History and consisting of fashionable and worthless phenomena. Giedion invents the "constituent facts," which he, owing to his operative historiography, regards as an unavoidable historical causation, in the will to historicize the characteristics of architecture and some affirmative symptoms of his era. By this way, he presents the characteristics of Modern architecture tautologically as a historical causation.

In his book, Giedion repeatedly emphasizes many "constituent facts"[450] that emerge within different forms throughout history: the plane surface, curved wall, different types of vault, close contact with nature, traffic problems…etc. Giedion adapts those characteristics of Modern architecture he has historicized as "constituent facts" within the Space-time concept. Thus, under some impact also of Le Corbusier's normative architectural formulations, he begins to make use of the Space-time concept within such

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[449] Giedion, *S.T.A.*, p. 529. Italics are original. Emphases are added.

[450] According to Giedion, constituent facts may emerge in different forms throughout history: "The constituent element of Aalto's furniture, like **slab** in a bridge by Maillart or **plane surface** in a modern painting, is a **sheet** of plywood." Giedion, *S.T.A.*, p. 662. Emphases are added. According to David Watkin, "This emphasis [constituent facts] may have been derived from Viollet-le-Duc's belief

a comprehensive range of meaning as to contain "constituent facts" and together with their spatial feelings, concepts like "interpenetration," "hollowing out," "the hovering," "planes," "multiple viewpoints," "transparency," "simultaneity"...etc. Deeming the "heroic epic"[451] character of Bauhaus building as "crystallization of the new space conception," Giedion describes it as Space-time, within the context of this new entirety that is composed of "constituent facts" and their spatial feelings.

> "**The Bauhaus has a skeleton of reinforced concrete**. (…) **The continuous glass curtain is brought into abrupt juxtaposition with the horizontal ribbons of white curtain wall at the top and bottom of the building. An aerial photograph shows them plainly** for what they are: mere ribbons, supporting nothing. **In a bird's-eye view the whole cube seems like two immense horizontal planes floating over the ground.**
>
> **The glass curtain is not the limited and marked-off transparent area** which Eiffel had already exploited in the 1878 exhibition: **it flows smoothly around the building, the corners showing no vertical supporting or binding members.**
>
> (…) Two major endeavors of modern architecture are fulfilled here, not as unconscious outgrowths of advances in engineering but as the conscious realization of an artist's intent; there is **the hovering, vertical grouping of planes** which satisfies our feeling for a relational space, and there is **the extensive transparency that permits interior and exterior to be seen simultaneously**, *en face* and *en profile,* like Picasso's 'L'Arlésienne' of 1911-12 : **variety of levels of reference, or of points of reference, and simultaneity — the conception of space-time**, in short. In this building Gropius goes far beyond anything that might be regarded as an achievement in construction alone.
>
> **The glass curtain wall** is famous, but the really important function of the Bauhaus was fulfilled by **it as a unit**.
>
> (…) **The Bauhaus complex is an arrangement of cubes, one juxtaposed against another — cubes differing in size, material, and location**. The aim is **not to anchor them to the ground but to have them float or hover upon the site**. This is the reason for **the winglike connecting bridges** and the **liberal use of glass. The glass was called in for its dematerializing quality**; the previous generation had used it either for practical purposes or (in private houses) had stained or painted it.

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in 'éléments constituifs.'" David Watkin, *Morality & Architecture, Revisited*; (rev. ed., Chicago: Chicago Uni. Pr., 2001[1977]), p. 65. Unnumbered footnote.

[451] Wolfgang Thöner alleges that, with Giedion's book *B.F.B.I.B.F.,* the Bauhaus building has become a protagonist in the "heroic epic" of Modernism and with the book *S.T.A.*, it has been the second canonization. "At its most successful the Bauhaus building became a model as one of the major protagonists in the 'heroic epic' of Modernism's struggle with the '19th century masquerade.'" Wolfgang Thöner, "A Symbol of Hope, or of Failure? The Bauhaus Building in Publications" in *The Dessau Bauhaus Building 1926-1999*, Margret Kentgens-Craig, ed., (Basel: Birkhäuser Verlag, 1998), pp. 123-133.

> **These cubes are juxtaposed and interrelated**. Indeed, they **interpenetrate** each other so subtly and intimately that **the boundaries of the various volumes cannot be sharply picked out.** The views from the air show how thoroughly each is blended into a unified composition. **The eye cannot sum up this complex at one view; it is necessary to go around it on all sides, to see it from above as well as from below. This means new dimensions for the artistic imagination, an unprecedented many-sidedness**.
>
> (…) The Bauhaus was the only large building of its date which was so complete a **crystallization of the new space conception**."[452]

The mostly criticized aspect of Giedion is the parallelism between the transparencies of Walter Gropius's Bauhaus building built at Dessau in 1926 and Pablo Picasso's painting *Head* of 1912 insistently[453] placed by Giedion on opposite pages.[454] The most important factor influencing Giedion to place these two images in a double-page spread is "simultaneity" rather than transparency. He makes use of the simultaneity concept within plural meanings just as in his other concepts. He uses simultaneity sometimes in the sense of being within the same period expressed by *Zeitgeist,* and sometimes in context of many-sidedness and facetness of the "fragmented Totality" providing for "total image of Reality." The same concept is put in question also for establishing links and connections between paragraphs and thoughts as much as images. Owing to the parallelism he has constructed between Picasso's painting *Head* and Lucia Moholy's

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[452] Giedion, *S.T.A.*, pp. 493, 496-497. Italics are original. Emphases are added.

[453] "Stanislaus von Moos, for example, insisted that the precipitate analogies established by Giedion with respect to Walter Gropius' Workshop Building for the Bauhaus at Dessau (1925-1926) and Picasso's *L'Arlésienne* of 1912 were difficult to maintain today. Many people have demonstrated that one cannot establish such simplistic relations. Von Moos, who had been Giedion's secretary, remembered (as if in an afterthought) how much Giedion had insisted that in the layout of the book's last edition, images of those works were to be placed face to face. Even Giedion seems to have realized the fragility of his proposition (as if the argument would fall apart without the images)." Colomina, *ibid*, p. 145.

[454] For critics of Giedion's interpretation of Transparency also see: Colin Rowe and Robert Slutzky, "Transparency: Literal and Phenomenal," in Colin Rowe, *The Mathematics of the Ideal Villa and Other Essays* (Cambridge: The MIT Press, 1976), pp. 159-183. This essay was written in 1955-1956 and first published in *Perspecta*, no. 8 in 1963; It was translated into German as *Transparenz*, ed. Bernhard Hoesli (Basel: Birkhäuser Verlag, 1968) and reprinted as *Transparency*, (Basel: Birkhäuser Verlag, 1997); Peter Collins, *Changing Ideals in Modern Architecture, 1750—1950* (Montreal: McGill University Press, 1967), pp. 287-293; Detlef Mertins, *Transparencies Yet To Come: Sigfried Giedion and the Prehistory of Architectural Modernity*, (Ph.D. Diss., Princeton Uni. Pr., 1996); Detlef Mertins, "Anything But Literal: Sigfried Giedion and the Reception of Cubism", in *Architecture and Cubism*, Eve Blau and Nancy J. Troy, eds., (Cambridge, Mass.: The M.I.T. Press, 1997), pp. 219-251; Sokratis Georgiadis, *Sigfried Giedion; An Intellectual Biography*, (Edinburgh: Edinburgh Uni. Pr., 1993), esp. chapter 5: "Space, Time, and Architecture, The First Great Synthesis," pp. 97-150.

photograph of the Bauhaus building at Dessau (Figure 4.8), Giedion loads an additional meaning of transparency to the concept of simultaneity, and in turn, of Space-time:

> "PICASSO. 'L'Arlésienne,' 1911-12. Oil. In the head may be seen the cubist device of **simultaneity — showing two aspects of a single object at the same time, in this case the profile find the full face. The transparency of overlapping planes** is also characteristic"[455]

> "WALTER GROPIUS. The Bauhaus, Dessau, 1926. Corner of the workshop wing. In this case it is **the interior and the exterior of a building which art presented simultaneously. The extensive transparent areas dismaterializing the corners, permit the hovering relations of planes and the kind of 'overlapping'** which appears in contemporary painting."[456]

4.2.2 *Space-time* as an Instrument for the Opportunity to Define the New Mode of the Visual Perception of Modern Subject and Its Dynamic Experience under the Effect of Changing Subject-Object Relationship

The basis of Giedion's Space-time conception corresponds to a re-definition under effect of mobility in subject-object relationship. Giedion has constructed his theory on consecutive perspectives that were to change by mobility of the subject and on the thought that the sequential perceptions of mobile beholder would break the one-point perspective of the static subject. Hence, Giedion's theory required firstly to be broken the stability of subject just before the one-point perspective. In this case, what would become **temporal was not the space, but rather the observer** who were to perceive it in motion. The theory was based upon multiplication of the focus points by perception of the mobile subject. In result, with his Space-time theory, Giedion renders features of **the subject as temporal, rather than corporeality of space**, and just like Lissitzky and Le Corbusier have suggested previously, he proposes a change in subject-object relationship.

Peter Collins objects to Giedion for naming his theory of mobile perception as Space-time, and instead suggests the concept of "parallax":

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[455] Giedion, *S.T.A.*, p. 494. Caption of Fig. 298. Emphases are added.

[456] Giedion, *S.T.A.*, p. 494. Caption of Fig. 299. Emphases are added.

"Perhaps, then, Giedion's views might be summarized by saying: modern architecture is characterized by the fact that the inside of a modern building can often be appreciated from single external viewpoints, and the external totality of a modern building can only be appreciated as a sequence of visual impressions. If this is so, it is the converse of what occurs when one looks at traditional buildings of similar purpose; for in a typical Renaissance villa comparable to the Villa Savoie, the totality of the outside of the building is intelligible—from a single viewpoint (because of the axial symmetry), whereas the interior can only be appreciated—as a sequence of visual impressions obtained by moving from room to room. But 'fourth-dimensional' does not, for Giedion, simply refer to the movement of an observer. In an introductory passage, he makes dear that he regards it as evidence of the evolution of art. The Renaissance manner of seeing the world three-dimensionally, he tells us, was an important step forward, because the art of previous centuries had been two-dimensional. Thus our contemporary four-dimensional vision is in one sense revolutionary, but in another sense it is simply an inevitable advance in the evolutionary progress of civilization.

(…) When Wölfflin discusses Baroque interiors, his descriptions are almost indistinguishable from Giedion's description of the Space-Time experience of the Villa Savoie. 'We move round them,' he writes, 'because in the intersections new pictures constantly arise. The goal cannot lie in a final revelation of the intersected form—that is not even desired—but in the perception, from as many sides as possible, of the potentially existing views.'"[457]

"The change, which occurred in the mid-eighteenth century concerned new devices for achieving parallax. Parallax is defined by the dictionary as 'the apparent displacement of objects caused by an actual change in the point of observation'. In ordinary experience this means, for example, that as one rides in a fast car, distant objects seem to be travelling at the same speed as the car relative to, say, nearby trees or poles which line the road. In architecture, it means that as one moves through or past a colonnade, the columns not only appear to change position relative to one another, but also appear to change position relative to whatever is perceived through them or behind them.

The multiplication of real (as opposed to illusionistic) effects of parallax was to prove impossible until developments in steel and reinforced concrete construction made every large building essentially a sequence of free-standing columns, and until the manufacture of large sheets of plate glass and the invention of modern heating equipment made buildings of every sort capable of becoming vast glazed hypostyle halls."[458]

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[457] Collins, *ibid*, pp. 292-293.

[458] Collins, *ibid*, p. 27.

"(…) I suspect that the immediate source of Giedion's theory is to be found nor in Wölfflin's lectures or Einstein's theory, but in an extremely influential and popular German book which appeared in 1918, when Giedion was a student in Munich, namely Spengler's *Decline of the West.* If specific evidence were required to demonstrate Spengler's influence on Giedion, it could be adduced by the terra 'Faustian', that most Spenglerian of expressions, which occurs in *Space, Time and Architecture* with reference to the League of Nations competition. But for readers of Giedion nothing could be more conclusive than the following quotation from *Decline of theWest*:

> 'The Temple of Poseidon at Paestum and the Minster at Ulm... differ precisely as the Euclidian geometry of bodily bounding-surfaces differs from the analytical geometry of the position of points in space referred to spatial axes. All Classical building begins from the outside, all Western from the inside... There is one and only one soul, the Faustian, that craves for a style which drives through walls into the limitless universe of space, and makes both the exterior and the interior of the building complementary images of one and the same world-feeling.... The Faustian building has a *visage,* and not merely a façade.'

'Faustian' might well be an appropriate substitute for the increasingly unpopular word 'International' as a stylistic identification of twentieth century architecture, but regardless of 'style', I would suggest that in fact the visual effects usually referred to as Space-Time, Fourth-Dimensional, and so on, *are nothing more or less than modern developments of the exploitation of effects of parallax....* The phenomenon of parallax (whereby an apparent displacement of objects occurs when the point of observation changes) is also, like Space-Time, a device for astronomical measurement, but unlike Space-Time it has been an important element of architectural composition, and has been manifest in architecture ever since, the first hypostyle hall was constructed. It occurs in every large space containing rows of free-standing columns, and must have produced: 'particularly striking effects in the great mediaeval churches and halls when these were also subdivided by low screens, or spanned by deep hammer-beam roofs."[459]

Detlef Mertins similarly uses the concept of parallax for analysis of movement in the *promenade architecturale* of Le Corbusier at the Villa Savoye:

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[459] Collins, *ibid*, pp. 292-293. Italics are original. At three points in S.T.A., Giedion uses the term "Faustean". For Expressionism: "The movement eloquently states the grievances of mishandled humanity and indicts a tragic sitution. But there is a fundamental difference between expressionism and other movements we have encountered—cubism, futurism, and the rest. Faustean outburst against an inimical world and the cries of outraged humanity cannot create new levels of achievement," S.T.A., pp. 485-486; For Aalto's Sunila Factory and its Landscape: "Close to the shore is an island of logs which have been floated down the river from distances of hundred of miles. A cable crane picks them out to feed the machines. Ships wait in the bay to carry the brown cellulose sheets overseas. It is a Faustian prospect," S.T.A., p. 645; And for those projects participating in League of Nations Palace

> "As Giedion's combination of planar and oblique views suggests, he recognized that Le Corbusier's architecture aimed to dissolve mass into surface for the perception of observers moving in space, appreciating through parallax the phenomenon of 'corners merging into one another,' of clear independent volumes collapsing into two-dimensionality only to spring back into depth a few steps later."[460]

What Giedion calls Space-time in Villa Savoye, regarding to its mobile perception and dematerialized characteristics is termed as *promenade architecture* by Le Corbusier who genealogizes this dynamic structure to Arab architecture. The similarity between the movement characteristic of Le Corbusier's *promenade architecture* and the film is expressed by Colomina as follows:

> "Modern eyes move. Vision in Le Corbusier's architecture is always tied to movement: 'You follow an itinerary,' a *promenade architecturale*. About this Le Corbusier will become more explicit in his Villa Savoye at Poissy (1929-1931): 'Arab architecture gives us a precious lesson. It is appreciated by walking, on foot; it is by walking, by moving, that one sees the order of the architecture developing. It is a principle contrary to that of baroque architecture, which is conceived on paper, around a fixed theoretical point. I prefer the lesson of Arab architecture. In this house it's a question of a real architectural promenade, offering constantly changing views, unexpected, sometimes astonishing.' The point of view of modern architecture is never fixed, as in baroque architecture, or as in the model of vision of the camera obscura, but always in motion, as in film or in the city."[461]

Despite the fact that Giedion points to "the glassed staircase" as the reason underlying movement in space[462] with regard to Gropius' Factory building for the Werkbund exhibition at Cologne in 1914, in his later expressions, he equates interpenetration with simultaneity by conceiving of representativeness rather than its

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Competition: "From the northern countries and from Germany there came either smooth and placidly decorative projects for Faustean expressionistic sketches in soft charcoal," S.T.A., p. 536.

[460] Mertins uses the concept in relation to Bois' interpretation. Mertins, "Anything But Literal," p. 240, fn. 101. Mertins quotes the concept of Parallax from "A Picturesque Stroll around Clara-Clara," Yve-Alain Bois, *October* 29 (1984), pp. 32-62.

[461] Beatriz Colomina, *Privacy and Publicity; Modern Architecture as Mass Media*, (Cambridge, Mass.: The M.I.T. Press, 1996), pp. 5-6. Italics are original.

[462] "The impression one receives from it is similar to that produced by the **glassed staircase** in Gropius' exhibition building of 1914: it suggests a **movement in space** that has been seized and held." Giedion, S.T.A., p. 497. Emphases are added.

physicality[463] (Figures 4.20 and 4.21). By this way, Space-time is used as to have a dual meaning: in sense of visual interpenetration provided by lightening, transparency and glazed surface on the one hand, and of Space-time experience providing for perception in motion to the extent that the rising subject is disoriented turning round upwards the stairs, on the other. As a result of all these meanings he has loaded upon Space-time and perception in motion both, the aim Giedion has adopted becomes manifest: "true nature of space" and its "four-dimensional experience."[464]

293. WALTER GROPIUS. Spiral staircase on corner of the "Fabrik," Cologne, 1914. *These staircases entirely enclosed in glass seem like movements seized and immobilized in space.*

Figure 4.20. Transparent glass surface of the spiral staircase on corner of Walter Gropius' "Fabrik," in Werkbund Exhibition in Cologne in 1914. From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), p. 486.

[463] "The production of futurist painting, sculpture and architecture are based on **the representation of movement and its correlates: interpenetration and simultaneity.**" Giedion, *S.T.A.*, p. 445. Emphases are added.

[464] "To a previously unknown extent, outer and inner space are interpenetrating. This effect can only be experienced in descending the spiral stairs from the top, when the soaring lines of the structure intersect with the trees, houses, churches, and the serpentine winding of the Seine. **The interpenetration of continuously changing viewpoints creates, in the eyes of the moving spectator, a glimpse into four-dimensional experience.**" Giedion, *S.T.A.*, p. 284. Emphases are added.

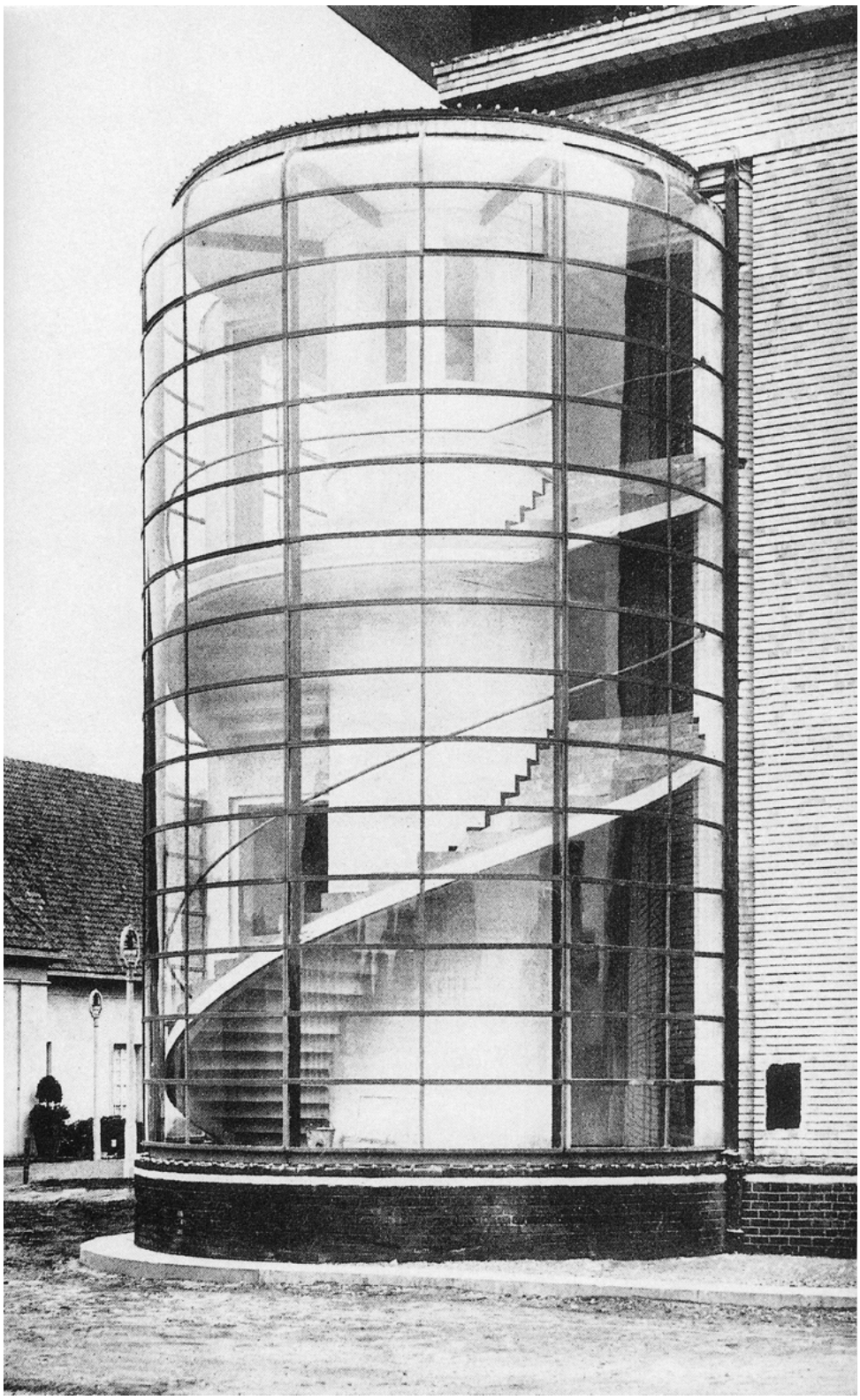

Figure 4.21 Walter Gropius' spiral staircases on corner of the "Fabrik" in Werkbund Exhibition in Cologne of 1914. Published in *Wasmuths Monatshefte für Baukunst*, (1915), p. 198. From *Kristallisationen, Splitterungen; Bruno Tauts Glashaus*, Angelika Thiekötter, ed., (1993), p. 17.

> "**The essence of space** as it is conceived today is its **many-sidedness**, the infinite potentiality for relations within it. Exhaustive description of an area from one point of reference is, accordingly, impossible; its character changes with the point from which it is viewed. **In order to grasp the true nature of space the observer must project himself through it**. The stairways in the upper levels of the Eiffel Tower are among the earliest architectural expression of the continuous interpenetration of outer and inner space."[465]

Giedion gives the first hint for reaching the "true nature of space": "many-sidedness as the characteristics of the essence of space." In the first chapter titled as "Anonymous History" of the book *Mechanization Takes Command* he has written in 1947, Giedion sets forth the relation, which he has constructed between "facetness" and "many-sidedness" for reception of the "Reality," as a model:

> "Anonymous history is many sided, and its different departments flow into one another. Only with difficulty can they be separated. The ideal in anonymous history would be to show **simultaneously the various facets** as they exist side by side, together with the process of their interpenetration. **Nature does this in the eye of the insect—a lens of multiple facets—fusing its distinct images of the outer world into an integrated picture.** The individual does not have such power. We must be grateful if this objective is fulfilled only in **the fragment**."[466]

Space-time is produced by Giedion as an optical movement to receive this "fragmentary Totality." Giedion's *Telos* of Unity appears to have been influential over this conceptualization as well. Each fragment will preserve its individual character on the one side, and make up Totality by gathering together, on the other: "fragmentary Totality."[467] Regarding the totality as what Giedion has described to be "like the organs of a body," the Tuberculosis Sanatorium Aalto has constructed in Paimio between 1929-1932 is depicted to have the following scene:

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[465] Giedion, *S.T.A.*, p. 435. Emphases are added.

[466] Giedion, *M.T.C.*, p. 4. Emphases are added.

[467] Giedion's *Telos* of Unity that covers individuality and totality together, based on the ideas of Burkhardt and Wölfflin: "The basic Hegelian assumptions in such a passage derive immediately from Burckhardt who had, of course, taught Giedion's own master, Wölfflin. Burckhardt had expressed a belief that: 'Every cultural epoch which presents itself as **a complete and articulate whole** expresses itself not only in the life of the state, in religion, art and science, but also imparts its **individual character** to social life as such.'" Watkin, *ibid* p. 65. Emphases are added. Watkin quotes from *The*

> "Wherever you stand, new aspects enrich the **space-time conception** of this complex. **Each of the walls has its own existence and is formed according to the function of the rooms behind it, but all are modeled and related to each other by a strong plastic vision.** At the time of its construction no building in the northern countries could compare with the sanatorium at Paimio in its purity of form and boldness of conception. As in Le Corbusier's League of Nations Palace, as in the Bauhaus, **the various parts are fully integrated — like the organs of a body — each having its distinct functions and yet being inseparable from the others.** Only by encompassing the whole compound can one perceive its **space-time planning** and its relation with earth and woods."[468]

What provides for the totality that integrates the pile of fragments resembling a mosaic is, according to Giedion, the relationship established in between;

> "From these well-calculated masses one becomes aware of a new fantastic element inherent in the **space-time conception** of our period. **The interrelations which the eye achieves between the different planes** give their clearly circumscribed volumes an **extraordinary new effect**, somewhat like that of **a rotating sphere of mirrored facets in a ballroom when the facets reflect whirling spots of light in all directions and in every dimension**."[469]

From then on, the most important thing, which will render this fragmented structure as within totality and will construe its "meaning," is the subject to observe it. Thus, with the help of his Space-time theory, Giedion confronts the most important problem of the 20th century: **discharge of meaning from the object to be possessed to the subject and becoming gradually to a more fragile characteristic**.

The connections and relationships constructed by the subject to give the object its meaning are explained by Giedion via the photographic collage as the representation of R.C.A. Building in Rockefeller Plaza and Van Doesburg's "Space-time" entitled drawing. In the additional part of the last edition of *S.T.A.*, Giedion appends the meaning of not only "many-sided view," but also of "many-sided approach" to his Space-time concept as well. In his last period Giedion is interested in the effects of the large scale problems in city planning and "group design" approach, which is involved

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Civilization of the Renaissance in Italy, Jacob Burckhardt, (4th ed., London: Phaidon Press, 1951[1860]), p. 217.

[468] Giedion, *S.T.A.*, p. 632. Emphases are added.

[469] Giedion, *S.T.A.*, p. 851. Emphases are added.

individuality and combination simultaneously. Giedion alleges that buildings in Rockefeller Center that are related to both space and time as an example of the "group design" approach (Figure 4.24 and 4.25).

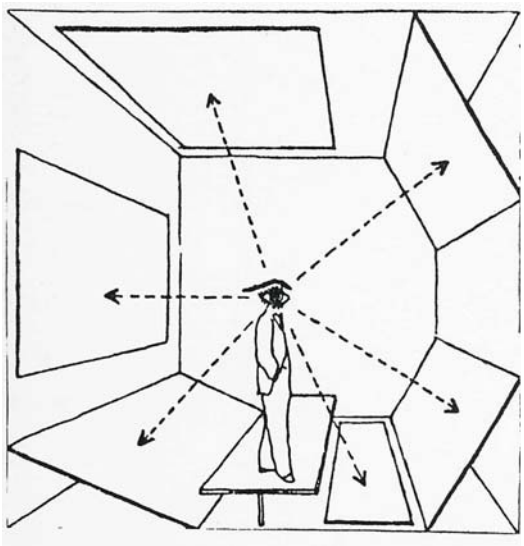


Figure 4.22 Herbert Bayer's exhibition sketch, ca. 1936. From *El Lissitzky; Beyond the* Abstract Cabinet*: Photography, Design, Collaboration*; Margarita Tupitsyn, (1999), p. 58.

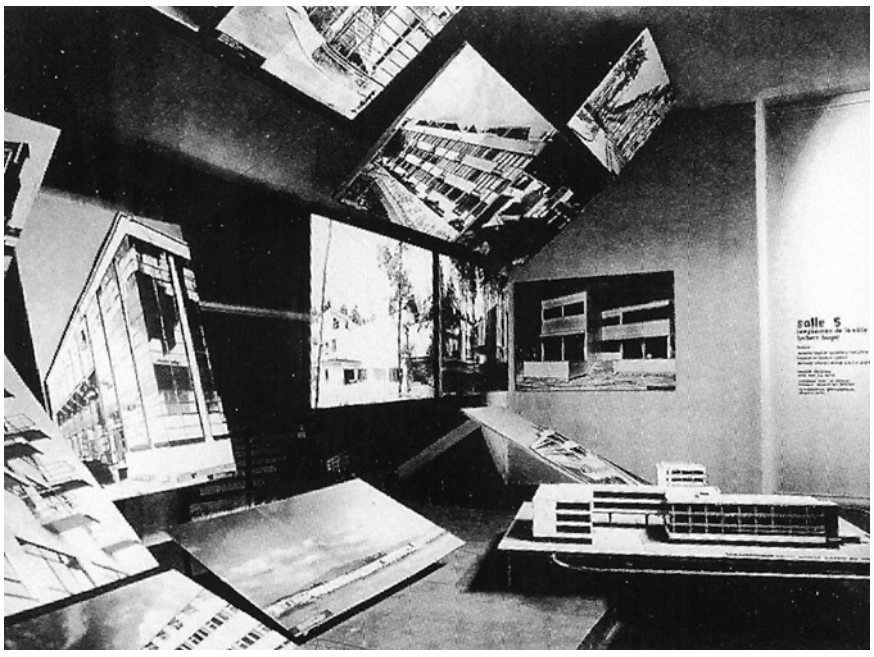
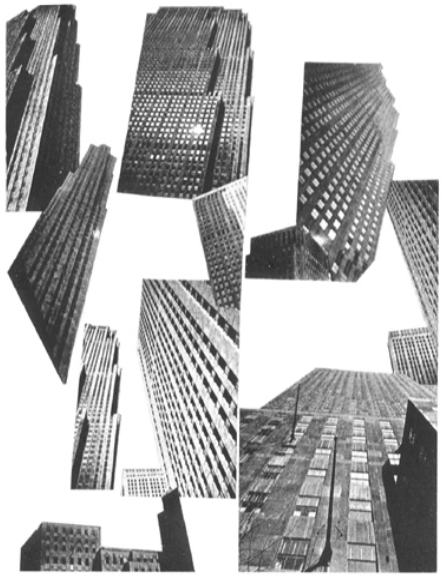


Figure 4.23 Herbert Bayer's design for the Room 5 of the German Section at *the Exposition Internationale des Arts Décoratifs* in Paris, 1930. Bauhaus Archive, Berlin. From *El Lissitzky; Beyond the* Abstract Cabinet*: Photography, Design, Collaboration*; Margarita Tupitsyn, (1999), p. 60.



522. Rockefeller Center. *Photomontage. Expressions of the new urban scale like Rockefeller Center are forcefully conceived in space-time and cannot be embraced in a single view. To obtain a feeling for their interrelations the eye must function as in the high-speed photographs of Edgerton.*

our own age. The difference can be indicated by comparing it with such thirteenth-century structures as the leaning towers of the two noble families of Asinelli and Garisenda in Bologna (*fig.* 521). These private patrician fortresses rise magnificently into the sky, but they can be embraced at a single glance, in a

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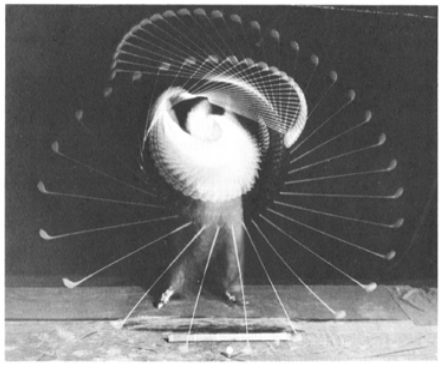
single view. There is no uncertainty in the observer concerning their relation to each other. On the other hand, a view restricted to its central axis reveals none of the essential character of an organism like Rockefeller Center. It possesses symmetries which are senseless in reference to the aesthetic significance of the whole. The complex must be comprehended in terms of space and time analogous to what has been achieved in modern scientific research as well as in modern painting.

In Edgerton's stroboscopic studies, in which motion can be fixed and analyzed in arrested fractions of 1/100,000 of a second, a complete movement is shown separated into its successive components (*fig.* 523). At Rockefeller Center the human eye must function similarly (*fig.* 522); it has to pick up each individual view singly and relate it to all others, combining them into a time sequence. Only thus are we able to understand its grand play of volumes and surfaces and perceive its many-sided significance.



523. EDGERTON. Speed photograph of golf stroke. *In Edgerton's stroboscopic studies in which motions can be fixed and analyzed in arrested fractions of 1/100,000 of a second, a whole movement is separated into its successive components, making possible comprehension in both space and time.*

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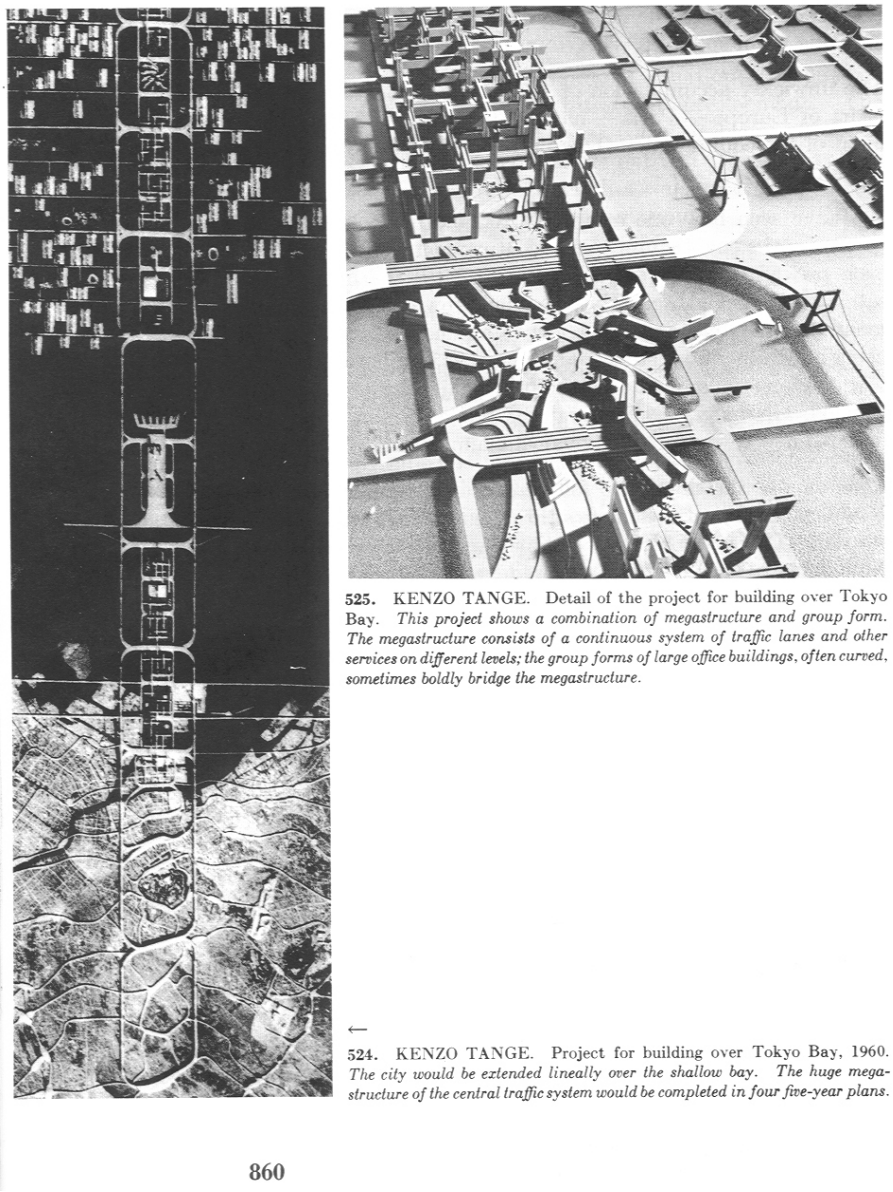
Figure 4.24 Constructing the parallelism between photomontage of the Rockefeller Center and the stroboscobic photograph of a golf stroke in motion to justify the insufficiency of the single view to grasp the many-sided characteristic of the Modernity. The accompanying text reads, "Expression of the new urban scale **like** Rockefeller Center are forcefully conceived in space-time and **cannot be embraced in a single view**. To obtain **a feeling for their interrelations** the eye must function **as** in the high-speed photographs of Harold E. Edgerton." From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), pp. 852-853. Fig. 522 and 523. Emphases are added.

Claiming that Modernity's dynamism can be represented only by means of these multiple views, he presents the photographic collage of R.C.A. Building in Rockefeller Plaza as a means for representation of Space-time:

> "Rockefeller Center. Photomontage. Expression of the new urban scale like **Rockefeller Center are forcefully conceived in space-time and cannot be embraced in a single view**. To obtain in **a feeling for their interrelations** the eye must function as in the high-speed photographs of Edgerton."[470]

[470] Giedion, *S.T.A.*, p. 852. Caption of Fig. 522. Emphases are added.

"Edgerton. Speed Photograph of golf stroke. In Edgerton's stroboscobic studies in which **motions can be fixed and analyzed** in arrested fractions of 1/100 000 of a second, a whole movement is separated into its successive components, **making possible comprehension in both space and time**."[471]



525. KENZO TANGE. Detail of the project for building over Tokyo Bay. *This project shows a combination of megastructure and group form. The megastructure consists of a continuous system of traffic lanes and other services on different levels; the group forms of large office buildings, often curved, sometimes boldly bridge the megastructure.*

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524. KENZO TANGE. Project for building over Tokyo Bay, 1960. *The city would be extended lineally over the shallow bay. The huge megastructure of the central traffic system would be completed in four five-year plans.*

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Figure 4.25 Giedion's theory of the Group design consists of the individuality of the buildings in the integral system, which is exampled by Kenzo Tange's city project over Tokyo Bay of 1960. From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), p. 860. Fig. 524, 525.

[471] Giedion, *S.T.A.*, p. 853. Caption of Fig. 523. Emphases are added.

With the expression, "At Rockefeller Center **the human eye must function similarly; it has to pick up each individual view singly and relate it to all others, combining them into a time sequence**," division of motion into moments with the help of Stoboscobic photography and the mental combination[472] of these moments to constitute a mentally "total image" is regarded by Giedion as Space-time;

> "Such a great building complex presupposes **not the single point of view of the Renaissance but the many-sided approach of our own age**. The difference can be indicated by comparing it with such thirteenth-century structures as the leaning towers of the two noble families of Asinelli and Garisenda in Bologna. These private patrician fortresses rise magnificently into the sky, but **they can be embraced at a single glance, in a single view. There is no uncertainty in the observer concerning their relation to each other**. On the other hand, **a view-restricted to its central axis reveals none of the essential character of an organism like Rockefeller Center. It possesses symmetries, which are senseless in reference to the aesthetic significance of the whole. The complex must be comprehended in terms of space and time analogous to what has been achieved in modern scientific research as well as in modern painting.**
>
> In Edgerton's stroboscopic studies, in which **motion can be fixed and analyzed in arrested fractions** of 1/100,000 of a second, a **complete movement is shown separated into its successive components**. At Rockefeller Center **the human eye must function similarly; it has to pick up each individual view singly and relate it to all others, combining them into a time sequence. Only thus are we able to understand its grand play of volumes and surfaces and perceive its many-sided significance**."[473]

In his first book *B.F.B.I.B.F.,* stating that "the eye, through the interplay of the various horizontal surfaces, has an impression of the air always separating and hovering, just as our future cities will be shaped,"[474] Giedion assumes what air separates corporeality of object, visual-mental perception, i.e., Space-time combines it fragmentally. In this manner, the first condition to construe meaning of the object is to perceive of it in fragments through multiple views of the eye and then to combine in a

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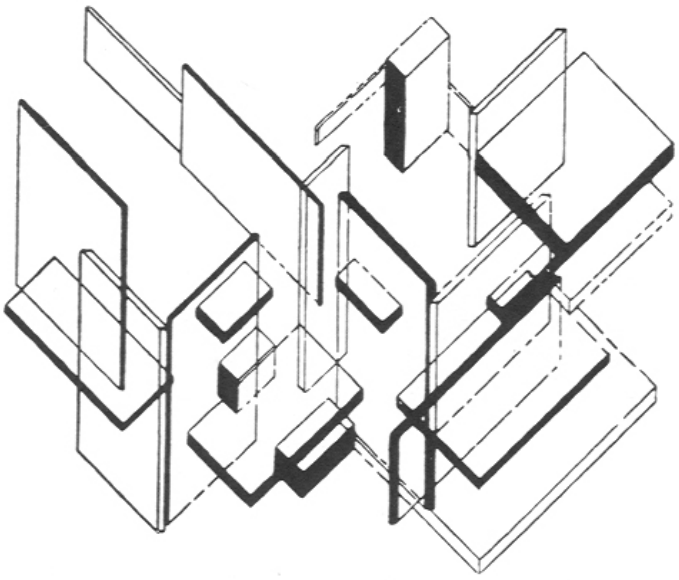
[472] "Through the free orientation of the thirty-six-story slab [Rockefeller Plaza] ...separated by the air but combined unconsciously by the observing human eye." Giedion, *S.T.A.*, p. 851.

[473] Giedion, *S.T.A.*, pp. 851-853. Emphases are added.

[474] Giedion, *B.F.B.I.B.F.*, p. 163.

mental process.[475] Giedion depicts Van Doesburg's drawing entitled "The Elementary Expressional Means of Architecture" as the "Relation of horizontal and vertical planes" in a manner as to emphasize the way in which those planes[476] that he regards as constituent facts keep their individuality, but combine at the same time[477] (Figure 4.26).



81. THEO VAN DOESBURG. Relation of horizontal and vertical planes. c. 1920.

Figure 4.26 Presenting the relation between horizontal and vertical planes in Theo van Doesburg's Counter-relief of 1923 as a model for the "plane" element of Giedion's "Constitutive Facts." From *Space, Time, and Architecture*, Sigfried Giedion, (1967 [1941]), p. 155. Fig. 81.

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[475] "The observer must be placed in the middle of the painting, not at some isolated, observation point outside. Modern art, like modern science, recognizes the fact that **observation and what is observed form one complex situation—to observe something is to act upon and alter it**." Giedion, *S.T.A.*, pp. 5-6. Emphases are added.

[476] "The pictures are gray-toned or earthen, like the grisaille of the Renaissance or the photographs of the nineteenth century. **Fragments of lines hover over the surface**, often forming **open angles** which become the **gathering places** of darker tones. These angles and lines began to grow, to be extended, and suddenly out of them developed one of **the constituent facts of space-time representation — the plane.**" Giedion, *S.T.A.*, p. 437. Emphases are added.

[477] "A drawing made about 1922 by the Dutch painter, poet, and architect, Theo van Doesburg, founder of the 'Stijl' group, shows **a conscious recognition** of this conception. It depicts the **interacting relations of hovering and transparent vertical and horizontal plane surfaces of a house.**" Giedion, *S.T.A.*, p. 155. Emphases are added.

Nevertheless, Van Doesburg uses the space-time concept in his book *The Principles of Neo-Plastic Art* in sense of abstraction of the object as reconstruction of the Reality. The Book includes two drawings, one a naturalistic view of a girl in a chair and the other a more abstract and Cubist-like view of a girl entitled "Space-time reconstruction of the same" (Raumzeitliche Rekonstruktion desselben) (Figure 4.27). Owing to this, through not only the naturalistic renderings of the objects, but also by those hidden realities never seen before, space-time becomes synonymous to abstraction, that is, **alienation**.

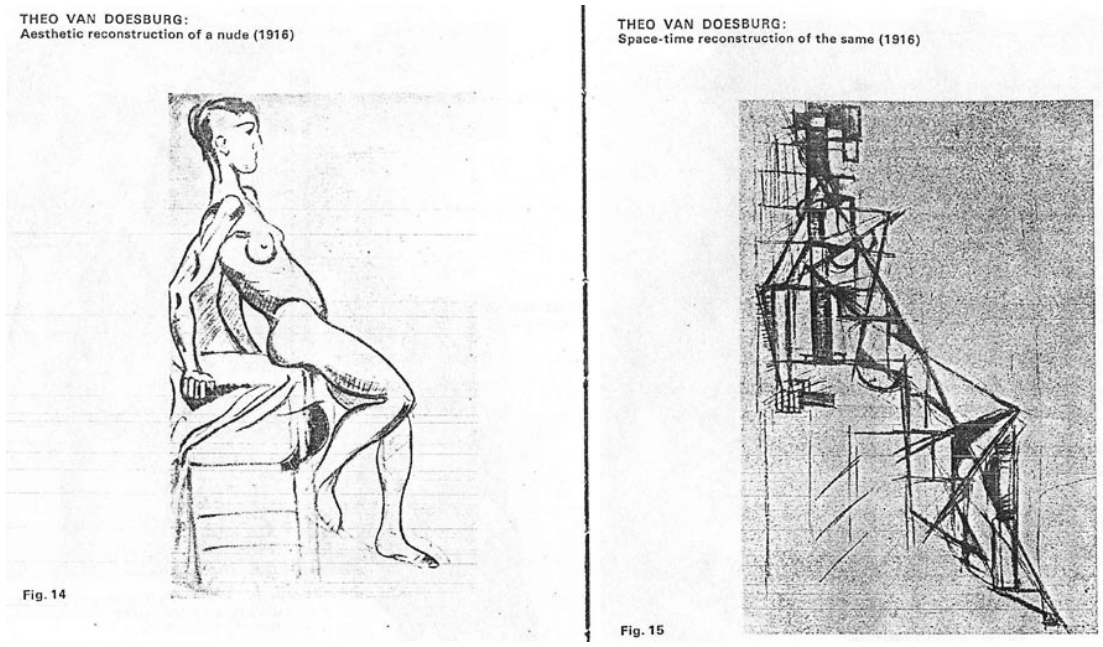

Figure 4.27 Van Doesburg's comparative illustrations of aesthetic and space-time reconstructions of a nude of 1916. From *Principles of Neo-Plastic Art*, Theo van Doesburg, (1968), p. 115. Fig 14 and 15.

Among those new technological inventions like X-ray, microscope, movie and photography which El Lissitzky[478] and Moholy-Nagy have previously used to alienate and render the object as unfamiliar, especially photography is suggested by Giedion as a new technique that reveals the "hidden" and "unseen" Reality of the object as a means

[478] An autobiographical typescript document from 1928, entitled "The Film of El's Life," Lissitzky makes the following entry: "My eyes. Lenses and eyepieces, precision instruments and reflex cameras, cinematographs which **magnify or hold split seconds**, Roentgen and X, Y, Z rays have all combined

of representation that can combine visually and mentally.[479] According to him, the revealed representative images of new "Reality" fragments, i.e., the totality of collage can only be combined mentally. Aware of the fact that such perception and combination will entail "duration," Giedion prefers to use "space and time" or merely "time" instead of "Space-time":

> "Rockefeller Center. It possesses symmetries which are senseless in reference to the aesthetic significance of the whole. **The complex must be**

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to place in my forehead 20, 2,000, 200,000 very sharp, polished searching eyes." Lissitzky-Küppers, *ibid*, p. 329. Emphases are added.

[479] In words akin to those of Giedion, Kepes speaks of the impact of such technological inventions as photography, movie and X-ray that reveal the hidden sides of Reality, upon perception of space as follows:

"The photographic emulsion is characteristically able to record on one picture surface two or more superimposed projections. The resulting effect compresses two or more spatial aspects and moulds them into **a broader type of space representation**. X-ray photography opened up a new aspect of the visible world. Things hitherto **hidden from the human eye could be penetrated and made visible. Here the transparency has a new meaning, because the depth of the object is also evaluated by its optical density**." Kepes, *ibid*, p. 80. Emphases are added.

"Photographic representation brought into **focus things and events** in their actual appearances, revealing much hitherto **unnoticed or blurred in our observation**. For the first time, men were ***able to freeze the moving processes*** of nature into light-and-shadow patterns. What **the eye was never able to do**, the optical system of the camera and the photo-sensitive emulsion could do. It could **record with objectivity** and precision the infinite variety of brightness differences reflected from surfaces.

(…) Objects seen from a distance become gradually **blurred and indefinite**.

(…) The eye is an optical instrument so constructed that it can focus only on one plane. **We are not able to see near and distant objects sharply at the same time**. We never realized this fully until another optical instrument, the camera, brought it forcibly to **our attention by freezing the relationship of blurred and clear images** on the picture surface of a photograph. Then, we could both see and study an image in all its subtleties of tone modulation. We became sensitive to the spatial significance of sharpness and lack of definition." Kepes, *ibid*, p. 148. Emphases are added.;

"Vision unchained by the photographic camera was able to explore hitherto **untouched territories** of perspective. Latent optical aspects became apparent because the camera was able to reproduce objects from an angle of vision that the unaided eye could not achieve in reasonable comfort, if at all. Not only the accustomed frontal and profile-views but also the view from above, the bird's-eye view, and that from below, the frog's-eye view, were recorded. The vanishing point which, in the traditional space representation, had usually been in the middle of the picture-plane was shifted left; right, up and down, into almost all possible positions. For each changing position there was not only a corresponding cut-out of the visual field but also, within this cut-out, a different foreshortening.

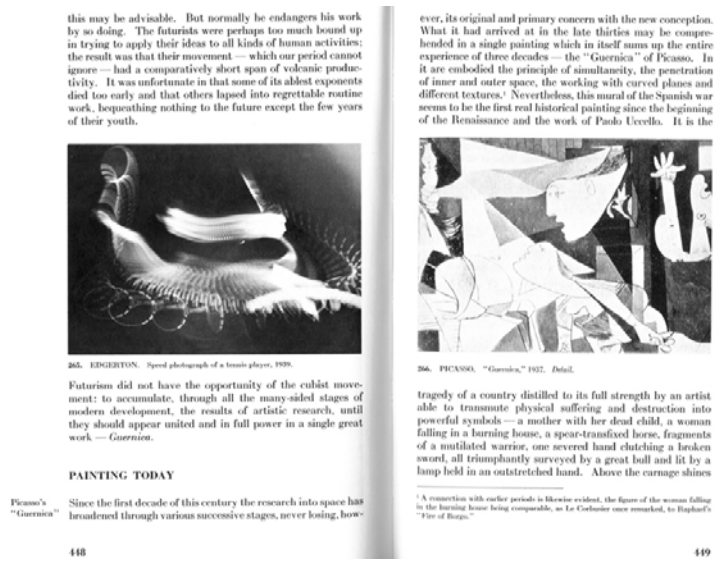
Motion picture photography still further increased the elasticity of foreshortening and introduced a hitherto **unseen flexibility** in the use of size differences for space accentuation. **The 'close-up' broke up the traditional continuous space unity** inherited through painting and theatre and **extended** the picture space to **amplified** dimension. In a sequence a 'close-up,' 'medium shot' and 'long shot' bring **a living, moving variety of expanding and condensing space**.

Optical accessories within or outside the camera were employed for the further exploration of the appearances of things. **Mirrors, prisms, and special lenses sketched, diffused, distorted, repeated, moulded the things and created images not corresponding to direct visual perception**." Kepes, *Language of Vision*, p. 91. Emphases are added.

comprehended in terms of space and time analogous to what has been achieved in modern scientific research as well as in modern painting."[480]

"At the same time, they are so disposed that an all-embracing space is created though **not visible at one glance** — a space that can only be **slowly perceived by including the dimension of time**, that is, by **movement.**" [481]

"However, the unity of his work is already clear, even though the outward appearances of his early and late work seem so different. A cubist painting by Picasso around 1912 is very different from his 'Guernica' (1937), **a painting that gave lasting form to a moment in time** — and also very different from his later female figures"[482] (Figure 4.28).



this may be advisable. But normally he endangers his work by so doing. The futurists were perhaps too much bound up in trying to apply their ideas to all kinds of human activities: the result was that their movement — which our period cannot ignore — had a comparatively short span of volcanic productivity. It was unfortunate in that some of its ablest exponents died too early and that others lapsed into regrettable routine work, bequeathing nothing to the future except the few years of their youth.

265. EDGERTON. Speed photograph of a tennis player, 1939.

Futurism did not have the opportunity of the cubist movement: to accumulate, through all the many-sided stages of modern development, the results of artistic research, until they should appear united and in full power in a single great work — *Guernica*.

PAINTING TODAY

Picasso's "Guernica"

Since the first decade of this century the research into space has broadened through various successive stages, never losing, how-

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ever, its original and primary concern with the new conception. What it had arrived at in the late thirties may be comprehended in a single painting which in itself sums up the entire experience of three decades — the "Guernica" of Picasso. In it are embodied the principle of simultaneity, the penetration of inner and outer space, the working with curved planes and different textures.[1] Nevertheless, this mural of the Spanish war seems to be the first real historical painting since the beginning of the Renaissance and the work of Paolo Uccello. It is the

266. PICASSO. "Guernica," 1937. *Detail.*

tragedy of a country distilled to its full strength by an artist able to transmute physical suffering and destruction into powerful symbols — a mother with her dead child, a woman falling in a burning house, a spear-transfixed horse, fragments of a mutilated warrior, one severed hand clutching a broken sword, all triumphantly surveyed by a great bull and lit by a lamp held in an outstretched hand. Above the carnage shines

[1] A connection with earlier periods is likewise evident, the figure of the woman falling in the burning house being comparable, as Le Corbusier once remarked, to Raphael's "Fire of Borgo."

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Figure 4.28 Parallelism between the visually deformated form of the head of a tennis player in the Edgerton's speed photograph of 1939 and morphologically deformated form of the head in the detail of Pablo Picasso's painting *Guernica* of 1937. From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), pp. 448-449. Fig. 265 and 266.

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[480] Giedion, *S.T.A.*, p. 853. Emphases are added.

[481] Giedion, *S.T.A.*, p. 603. Emphases are added.

[482] Giedion, *S.T.A.*, p. 554. Emphases are added. Unlike Cubists who adopt a representation of revolving movement, but similar to the way how Futurists express movement in linear terms, Giedion expresses *Guernica* painting as "a painting that gave lasting form to a moment in time." The reason underlying why Giedion considers *Guernica* as futuristic understanding of movement is the brutal formalistic parallelism he has constructed between the speed photograph taken by Edgerton in 1939 picturing a tennis player with a visually deformed face and the part of *Guernica* painting with a deformed woman face in its center. Regarding the differences between Futurist and Cubist understanding of movement, "Conception and Vision" written by Maurice Reynal in 1912 is enlightening. See fn. 267 of Chapter Time in this dissertation.

4.2.3 *Space-time* as an Instrument for the Opportunity to Construct Analogies, Parallelisms and Allusions between Science and Art to Justify the "New Space Conception" as a Means of *Zeitgeist*

Because of the unity he has tried to establish in between feeling (art) and thought (science), Giedion strives to impute "scientific" characteristics to Futurist and Cubist painters whom he thinks have been influential in development of modern architecture.[483]

Besides suggesting the combination of different identities of the mathematician, empirical scientist, and artist of the late Baroque period all in one person as a model for splitting and fragmentary Modernity,[484] Giedion constructs parallelism between mathematics and art by saying "Whenever a new conception appears in mathematics, it at once finds an artistic counterpart."[485] For Giedion, mathematics is an important

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[483] "One of the futurists' best minds and without any doubt their best sculptor, Umberto Boccioni, who died much too early, in 1916, has most clearly defined their purposes. In an effort to penetrate more deeply into the very essence of painting, he sought terms for his art, terms which, now obscurely felt, now shining clear and immediate in his increasing creative experience, anticipated those that later appeared in **the atomic theory**. 'We should start,' he said, 'from the central nucleus of the object wanting to create itself, in order to discover those new forms which connect the object invisibly with the infinite of the apparent plasticity and the infinite of the inner plasticity.'

(…) The French painter, Marcel Duchamp, who belonged neither to the futurists nor to the cubists, painted at the same time (1912) his 'Nude Descending the Staircase,' in which the movement is dissected **mathematically** and yet fully surrounded by the multi-significance of irrational art." Giedion, S.T.A., p. 445. Emphases are added.

"How charged with inner truth this [*Guernica*] symbol of Picasso's is is revealed by Edgerton's stroboscope, which photographically dissects movement into parts which the human eye is unable to grasp. A study of one of these stroboscopic photographs makes clear **how closely connected are the realizations of the creative artist and those of the scientist**, Out of the unknown, an artist like Picasso can produce intuitively symbols for a reality which, as in this instance, is afterwards **confirmed by scientific techniques**." Giedion, S.T.A., p. 450. Emphases are added.

[484] In his book, Giedion has referred to Modernity, Modern, and Modernization always in a negative tone: "...Bon Marché department store in Paris, now deprived of its original charm through **hopeless 'modernization.'**" Giedion, S.T.A., p. 279. Emphasis are added;

"Labrouste, afraid of his own daring, partially covered his glass screen with heavy red-velvet drapery, **unfortunatelly 'modernized'** in later renovations." Giedion, S.T.A., p. 227. Emphasis are added;

"No partial solution is possible; only preconcieved and integrated planning on a scale embracing **the whole structure of modern life in all its ramifications** can accomplish the task which Ebenezer Howard had in mind." Giedion, S.T.A., pp. 784-785. Emphases are added.

[485] Giedion, S.T.A., p. 122. "(…) a thoroughly **integrated culture** produces a marked unity of feeling among its representatives. For example, **a recognizable common spirit** runs through the whole baroque period. It makes itself felt in activities as distinct from each other as painting and philosophy or architecture and mathematics. This is not particularly surprising. **Techniques, sciences, the arts** — all these are carried on by men who **have grown up together in the same period**, exposed to its

instrument for development in architecture.[486] The confusion between non-Euclidean geometry and *n*-dimension that has been popular in 19th century seems to have been effective over Giedion's acceptance of the time concept as the fourth dimension:

> "The three-dimensional space of the Renaissance is the space of Euclidean geometry. But about 1830 a **new sort of geometry** was created, one which differed from that of Euclid in employing **more than three dimensions**. Such geometries have continued to be developed, until now a stage has been reached where **mathematicians deal with** figures and **dimensions that cannot be grasped by the imagination**."[487]

With the help of Hermann Minkowski's "Space-Time Continuum" theory, Giedion not only expresses time as fourth dimension, but also appears to have found a scientific justification for his unified "Space-time" theory. As also mentioned by Minkowski, appropriate to Giedion's *Telos,* this unification keeping individualities of "space" and "time" is expressed as "Continuum":

> "In 1908 the great mathematician Hermann Minkowski first conceived **a world in four dimensions, with space and time coming together to form an indivisible continuum.** His *Space and Time* of that year begins with the celebrated statement, 'Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only **a kind of union of the two will preserve an independent reality**.'"[488]

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characteristic influences. **The feelings which it is the special concern of the artist to express are also at work within the engineer and the mathematician**. This emotional background shared by such otherwise divergent pursuits is what we must try to discover." Giedion, S.T.A., p. 430. Emphases are added.

[486] "Similarly, the progress of mathematics brought something more into Baroque architecture than new instruments of calculation." Giedion, S.T.A., p. 183.

[487] Giedion, S.T.A., p. 435.

[488] Giedion, S.T.A., p. 14. Emphases are added. In his book, Giedion's citation from Minkowski has been written in a rather much different context in original:

"In September 1908 Hermann Minkowski delivered a lecture entitled 'Space and Time' before the 80th Assembly of German Natural Scientists and Physicians at Cologne. Minkowski's first words were revolutionary: 'The views of space and time which I wish to lay before you have sprung from the soil of experimental physics, and therein lies their strength. They are radical. Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality.' **The purpose of Minkowski's formulation of a four-dimensional continuum with three dimensions of space and one of time was to synthesize the points of view of all observers after Einstein had made them relative in 1905**. In the equation $dx^2 + dy^2 + dz^2 - c^2dt^2 = ds^2$, which was the mathematical representation of Einstein's premises, Minkowski discovered that he could describe the location of a point-event in a four-dimensional continuum. Using the word *substance* to refer to every participant in the continuum, he proposed individual 'world lines,' whose paths are determined by *dx, dy, dz,* and *dt*. Thus, the space of our

In 1965, the architectural historian Peter Collins draws attention to the doubtful structure underpinning the connections and justifications of Giedion, who wishes to relate Space-time also with science as much as with art:

> "Firstly, we can, as Burchard and Bush-Brown rightly observe, dismiss as an illusion any idea that using the words 'Space-Time' establishes a firm analogy with Relativity. Indeed, Giedion in one instance seems to dismiss this relationship himself as a 'temporal coincidence'. However inspiring the announcement of Einstein's initial theory must have been to painters and writers when it was published in 1905, and however exhilarating his startling experimental proof of the final theory (published a decade later) must have been in 1919, the fact is that neither had anything to do with the kind of space that painters, sculptors and architects are involved with, but were a development of the algebraic techniques of analytical geometry, extended to solve problems in dynamics. Moreover, although Einstein's general theory of relativity (which is concerned with accelerated motion)

Galilean frame at one instant is a cross section of the continuum and our time is represented as perpendicular to this section.

While a fourth dimension does appear in Minkowski's work of 1908, a curved non-Euclidean geometry, its usual companion in art-historical analyses of Cubism, is not present in Minkowski's lecture. In contrast to Christopher Gray's description of Minkowski's 1908 continuum as 'a four-dimensional Riemannian hyper-space, an isotropic continuum in which the time dimension was always essential in defining relationships,' the space-time continuum of 1908 was actually a flat, four-dimensional structure, free of any non-Euclidean or 'Riemannian' curvature. The problem of representation that might have been presented by the - c^2dt^2 term was temporarily solved by Minkowski by introducing $\sqrt{-1}$ to **make the time dimension imaginary, an acceptable alternative within Euclidean geometry**.

In addition to the fact that Riemann's name was not once mentioned in Minkowski's lecture, the final proof of the Euclidean nature of the space-time continuum in 1908 is provided by Einstein himself. Writing in later years of the development of Relativity Theory, Einstein summarized Minkowski's great contribution as 'his recognition that the four-dimensional space-time continuum of the theory of relativity, in its most essential formal properties, shows a pronounced relationship to the three-dimensional continuum of Euclidean geometrical space.'

The 'four-dimensional Riemannian hyper-space' mistakenly attributed by Gray to Minkowski in 1908 was only developed later by Einstein and published for the first time as his General Theory of Relativity in 1916. Einstein's Special Theory of 1905 had proven only all types of uniform motion (i.e., velocity) to be relative, while nonuniform motions (i.e., acceleration and gravitation) had retained the absolute status granted them by Newtonian mechanics. In his efforts to generalize relativity to include accelerated motion, Einstein by 1907 was able to suggest that an observer within a windowless room being pulled upward in space could never determine by experiment if his room was subject to a constant upward acceleration or was experiencing normal gravitational force on earth. Thus, one of the tenets of the General Theory was to be that the laws of nature are the same for all moving systems, whether their motion is uniform or not.

Einstein's investigation of the nature of gravitation was further spurred by Minkowski's creation of the space-time continuum for Relativity Theory in 1908 and the need to incorporate the effects of gravitation into the world of space-time. By 1911 Einstein was convinced of the equivalence of inertial and gravitational mass, and his theoretical experiments with gravitational and inertial systems suggested the definite ability of gravitation to curve the path of a beam of light and to modify its velocity. The presence of matter would thus produce a region of curved space-time around it, an idea presaged by Riemann's nineteenth-century suggestion that the structure of any metrical field must be affected by the presence of matter within that field." Dalrymple Henderson, *ibid*, pp. 356-357. Emphases are added.

involves non-Euclidian geometry, his 'special' theory of relativity (which is concerned with uniform velocity) does not.

It is dear therefore that when Giedion talks about non-Euclidian geometry as if Euclidian geometry were limited to three dimensions, and claims that 'like the scientist, the artist has come to recognize that classic conceptions of space and volume are limited and one-sided', or that 'the essence of space as it is conceived today is its many-sidedness', he is not talking about anything which would have been intelligible to Einstein; for Einstein never claimed that space was many-sided, or that 'in order to grasp the true nature of space the observer must project himself through it'. On the contrary, it was precisely because of the impossibility of measuring our absolute velocity through space that he engaged upon his famous research. His great feat was to demonstrate why it was that the true nature of space was not apparent to observers moving through it, and the truths he enunciated were more to the effect that problems of measurement involving mass and light are not so much a matter of geometry as a matter of history."[489]

After breaking off the pieces and paragraphs of texts from their context and letting them become alienated, Giedion reconciles the conflicting concept and thoughts via synthesis in line with his neo-Kantian *Telos*. Owing to his "Living History"[490] understanding, which provides for "extending Present" by extending the present to past and future,[491] Giedion undertakes a complementary, restorative[492] and mediator role that

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[489] Collins, *ibid*, pp. 292-293.

[490] Giedion, just like his instructor and mentor Wölfflin, takes an anthropopathic position towards history and phenemenon. Thus, he frequently uses expressions like "dead chronologies," "vitality," "living history," "lifeless masses of stone"...etc.

[491] "The creative artists of this period — poets, painters, sculptors, and architects — have taken another way. In their work, **past, present, and future merge together as the indivisible wholeness of human destiny**." Giedion, S.T.A., p. xliii. Emphases are added.

Tafuri sees this extending practice of 'present' as a result of operative criticism:

"(...) this [operative] type of criticism, by anticipating the ways of action, **forces history**: **forces past history** because, by investing it with a strong ideological charge, it rejects the failures and dispersions throughout history; and **forces the future** because it is not satisfied with the simple registering of what is happening, but hankers after solutions and problems not yet shown (at least, not explicitly so). **Its attitude is contesting towards past history, and prophetic towards the future**." Tafuri, *ibid*, p. 141.

[492] "The process of critical interpretation is transformed by Giedion into one of a **hypothetical or imaginary restoration** of the historical situation itself, whose **reconstitution** is at one with visual comprehension.

(...) Giedion's effort was to chart **the commerce** between inner and outer reality — especially the impact of mechanization on what he conceived as our unchanging humanity, on the stability of the individual psyche — and to project new means of **reconciliation**." Hays, *ibid*, p. 18. Emphases are added.

resolves all tensions.[493] Under such circumstances, the differences between the philosophical notion of time and the scientific notion of time are eliminated. He claims that even the philosophical duality between subjectivity and objectivity is resolved through "Space-Time Continuum" that he sees as scientific synthesis:

> "In the first decade of this century the physical sciences were profoundly shaken by an inner change, the most revolutionary perhaps since **Aristotle and the Pythagoreans**. It concerned, above all, the notion of time. Previously time had been regarded in one of two ways: either **realistically, as something going on and existing without an observer, independent of the existence of other objects and without any necessary relation to other phenomena; or subjectively, as something having no existence apart from an observer and present only in sense experience.** Now came another and **new way of regarding time**, one involving implications of the greatest significance, the consequences of which cannot today be minimized or ignored.
>
> As was stated at the beginning of this book, it was in 1908 that Hermann Minkowski, the great mathematician, speaking before the Naturforschenden Gesellschaft, proclaimed for the first time with full certainty and precision this fundamental change of conception, 'Henceforth,' he said, '**space alone or time alone is doomed to fade into a mere shadow; only a kind of union of both will preserve their existence.**'"[494]

The most important factor that renders Giedion's fragmented and propagandist narrative as convincing, is the persuasion mechanism in which he has converted the parallelisms and connections constructed between paragraphs and thoughts with the help of shared concepts.[495] The common point between Modern Physics and Cubism is

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[493] "The impact of Giedion's all-embracing totalitarian argument, with its **aim of silencing all discussion**, is to some extent softened by the pretentious language…" Watkin, *ibid*, p. 62, Emphasis are added.

"…Giedion's failure seems to me to be symptomatic of a larger problematic within the modernist avant-garde, one with a number of related manifestations. (…) the failure in Giedion's reception points, first, to an internal failure within his efforts **to resolve tensions** that he claimed to be resolving and that this, in turn, shows how Giedion's history was structured by an *aporia* inscribed into the history of the cultural avant-garde from its inception." Mertins, "System and Freedom," pp. 214-231. Emphasis are added.

[494] Giedion, S.T.A., p. 443. Emphases are added.

[495] "It is particularly strong in the German-Swiss art-historical tradition from Burckhardt and Wölfflin to Giedion and Pevsner. To criticize some of the results of this tradition is not, of course, to deny that all history is necessarily selective and that the art historian must therefore have some organizing principle, some antecedent idea, before he approaches a particular period. This may simply be a keen ability to perceive common aims, visual and spiritual, in apparently dissimilar objects or achievements. At some moments these common aims and themes will seem so dominant in so wide a variety of media and fields of intellectual and social activities that we can reasonably speak of a spirit

their "relativeness to a point of reference" and "simultaneity." In the case of the concepts become inadequate, Giedion sets forth what he expresses as the "temporal coincidence" or "language of time," that is, *Zeitgeist*:

> "What are the effects of this inner division? Only very rarely do we encounter a master in one field who is capable of recognizing workers of the same stature and tendency in another. **Contemporary artists and scientists have lost contact with each other; they speak the language of their time** in their own work, but they cannot even understand it as it is expressed in work of a different character."[496]

> "**Space in modern physics is conceived of as relative to a moving point of reference**, **not as the absolute and static entity** of the baroque system of Newton. And in modern art, for the first time since the Renaissance, **a new conception of space leads to a self-conscious enlargement of our ways of perceiving space**. It was in cubism that this was most fully achieved.
>
> The cubists did not seek to reproduce the appearance of objects from one vantage point; they went round them, tried **to lay hold of their internal constitution**. They sought **to extend the scale of feeling**, *just as* contemporary science extends its descriptions **to cover new levels of material phenomena**.
>
> 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 added a **fourth one — time**. The poet Guillaume Apollinaire was the first to recognize and express this change, around 1911. The same year saw the first cubist exhibition in the Salon des Indépendants. Considering the history of the principles from which they broke, it can well be understood that the paintings should have been thought a menace to the public peace, and have become the subject of remarks in the Chamber of Deputies.
>
> **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**."[497]

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of the age, though this may only mean that men were more swayed by fashion then than at other times." Watkin, *ibid*, p. 9

[496] Giedion, S.T.A., p. 12. Emphases are added.

[497] Giedion, S.T.A., p. 436. Italics are original. Emphases are added.

Determining the similarities within one period (*Zeitgeist*) as the language of aesthetics, Giedion attempts to establish physiognomy of "the modern" by translating these into materials and their means of expression. In this respect, the concept attains, not a physical character, but rather a dogmatic and ideological content with an operative suggestion for aesthetics and cultural life he has "selected" and presented:

> "The advancing and retreating planes of Cubism, **interpenetrating, hovering, often transparent, without anything to fix them in realistic position**, are in fundamental contrast to the lines of perspective, which converge to a single focal point."[498]

> "It was just at this time that in France and in Italy cubist and futurist painters developed **the artistic equivalent of space-time** in their search for **means of expressing purely contemporaneous feelings**."[499]

> "Concurrently the arts were concerned with the same problem. Artistic movements with inherent constituent facts, such as cubism and futurism, tried to enlarge our optical vision by introducing **the new unit of space-time into the language of art**. It is one of the indications of a **common culture** that the same problems should have arisen **simultaneously** and **independently** in both the methods of thinking and the methods of feeling.(…) During the Renaissance the common artistic perception, perspective, was expressed by one group of artists primarily through lines, and by another primarily through colors. So in our own day **the common background of space-time** has been explored by **the cubists through spatial representation and by the futurists through research into movement.**"[500]

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[498] Giedion, *S.T.A.*, p. 437. Emphases are added.

[499] Giedion, *S.T.A.*, p. 14. Emphases are added.

[500] Giedion, *S.T.A.*, pp. 443-444. Emphases are added.

4.2.4 *Space-time* as an Instrument for the Opportunity to Represent the New Dynamics of Modernity and the Characteristics of Modern Life

Beyond his identity as an architectural historian trained as an art historian, Giedion is a cultural historian.[501] Apart from its inherent "new cultural unity," the holistic approach, which he has proposed to eliminate the disintegrating, scattering and centrifugal forces of Modernity defined by him as "chaotic," "fragmentary" and "split," attains a programmatic character due to its claim for "socio-cultural whole." As mentioned in the beginning part of Giedion's book S.T.A., to the extent that the chaotic and anxious atmosphere of culture[502] is rendered as re-unified and undivided, it

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[501] "It is the route that present realities force us to take. **Unity**, for us, will have to come about through the unintended parallelisms in method that are springing up in the specialized sciences and the equally specialized arts. These are the indications that we are nearing a spontaneously established harmony of emotional and intellectual activities.

In both contemporary science and contemporary art it is possible to detect elements of the general pattern which our **culture** will embody. The situation is a curious one: our culture is like an orchestra where the instruments lie ready tuned but where every musician is cut off from his fellows by a soundproof wall. It is impossible to foretell the events that will have to come before these barriers are broken down. The only service the historian can perform is to point out this situation, to bring it into consciousness.

The degree to which its methods of thinking and of feeling coincide determines the **equilibrium** of an epoch. **When these methods move apart from each other there is no possibility of a culture and a tradition**. These are not deliberations remote from our subject: we shall soon see that it was just this unfortunate schism between its thought and feeling which struck down the magnificent power of the nineteenth century. **Out of such a schism come split personalities and split civilizations**." Giedion, S.T.A., p. 17. Emphases are added.

[502] In the opening words for the Foreword of the first edition, he states:

"*Space, Time and Architecture* is intended for those who are alarmed by the present state of our culture and anxious to find a way out of the apparent chaos of its contradictory tendencies.

I have attempted to establish, both by argument and by objective evidence, that in spite of the seeming confusion there is nevertheless a true, if hidden, unity, a secret synthesis, in our present civilization. To point out *why* this synthesis has *not* become *a conscious and active reality* has been one of my chief aims." Giedion, S.T.A., p. vi. Italics are original.

Wigley interprets Giedion's "anxiety of collapsing culture" as Tafuri's "anxiety of the historian":

"Giedion frames his argument in terms of the anxiety of the architect (in the face of the new techniques of construction that act as the repressed 'subconscious' of 19th-century architecture) and presents the historian as an analyst who searches for those 'tendencies that when they are suppressed, inevitably 'reappear.' Tafuri likewise describes the 'uneasiness,' 'uncertainty,' and 'terror' in the profession, the 'atmosphere of anxiety' produced by the modern impotence of architecture that leads to 'neurotic formal and ideological contortions.' To this he adds the 'anxiety of the historian,' the operative critic who, like the architect, finds the threat to architecture's status so 'disturbing' that it must be covered up and whose 'guilty conscience erupts in constructing linear routes that *force* architecture.'" Wigley, *ibid*, p. 52.

transform into a totalitarian "programme-worship."[503] As an early establisher of architectural historian identity apart from his art historian formation, Giedion bears contradictions within his multiple identities. By virtue of his paradoxal discourse on Modernity similar to the other avant-garde discourses, Giedion defines being "modern" and its roles as "the mediator" and "the transformer" between "the constructer" and "the destructionist." Giedion's aim is to break down the existing aesthetical values he sees as belonging not to classes, but mechanization. However, the problem in this constructing-destructing dilemma is that he strives to spread the avant-garde values instead of what he wants to breaks down. The point that differs Giedion from Adolf Loos and others, who insistently criticize the Modernization process and values of popular culture at the beginning of 20th century, is that he suggests avant-garde as a solution for eliminating all adverse characteristics and "ruling taste" of Modernization. Another point that renders his discourse as paradoxal is that he hopes to eliminate the fragmentazing and centrifugal forces of Modernity in the will to reach the integrity of the pre-industrial world.

In order to re-integrate the modern life understood by him as fragmentary, Giedion cross-fertilizes the techniques and concepts of avant-garde art into the realm of architecture. According to him, it is possible to conceive of fragmentary characteristic of Modernity only by means of "simultaneity":

> "**The presentation of objects from several points of view** introduces a principle which is intimately bound up with **modern life — simultaneity**."[504]

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[503] "The mechanistic interpretation of Gothic is particularly associated with Viollet-le-Duc who summarized it when he wrote: 'There are in architecture — if I may thus express myself — two indispensable modes in which truth must be adhered to. We must be true in respect of the **programme, and true in respect of the constructive processes.'** Here is the beginning of what we might call **the 'programme-worship' of modern architectural theorists** who believe that the elaborate specifications which the modern client, often a public body, hands to architects and engineers in the form of a **'programme' will and should dictate their own architectural solution**." Watkin, *ibid*, p. 13. Emphases are added. Watkin quoted from *Entretiens sur l'architecture,* E. Viollet-le-Duc, issued in separate parts, Paris, 1858—72, trans. B. Bucknall as *Discourses on Architecture,* 2 vols., Boston, 1889; reprinted London 1959, vol. i, p. 448.

[504] Giedion, *S.T.A.*, p. 436. Emphases are added. Van Doesburg uses a similar expression for life:

"In saying this, I definitely do not want to assume the rational as standard for the new architecture, because I am too much convinced that this standard should only be sought in the *inseparable* coalescence of logical construction and *sur-material* expression. This is what I have called in other places 'plastic architecture', ultimately an architecture that satisfies in the most elementary way our **multifaceted life**.

Le Corbusier's concept of "human agglomeration" proposed in the tenth CIAM Congress in 1956 overlaps with Giedion's modern city conception, which cannot be self-sufficient by virtue of the amorphous sprawl and uncontrolled dynamic movements.

Regarded by Giedion as a discipline of movement and "a constituent element of the urban structure,"[505] traffic is mentioned in the book repeatedly like the following foremost definitions: first, as an organization of pedestrian movement for people to climb up the Eiffel Tower;[506] second, as Pope Sixtus V, the first constructer of the traffic web of a modern city owing to the axes who has opened in city of Rome in 1585-1590; third as Haussmann, who emancipates the city by demolishing the Medieval period's effect of *rue corridor* along his boulevards in Paris, and finally, as the way how traffic is integrated to Sant'Elia's Futuristic city planning grounded on dynamism and speed aesthetic (Figure 4.29). Hence, by historicizing traffic, which he sees as one of the constituent facts of modernity and modern city, he expands it throughout the entire history.

Underlying the reason why Giedion regards traffic as a constituent fact take place the speed of Futurists and automobile of Le Corbusier and as for essays of Van Doesburg[507]

In order to clarify **the possibility of the unity** of so-called 'spiritual' and material-constructive elements in architecture, one should imagine a dwelling laid out practically and logically in all respects. Everything in it caters to our material needs in the most comprehensive sense. Living in this dwelling, we will feel satisfied in only one sense, this dwelling will be in harmony with ourselves in only one aspect — the physico-functional. However, architecture may be expected to give all-round satisfaction. Architecture will be the expression of the *complete* human being. That is to say: beside the physico-functional needs there are others (although inseparable from the ones mentioned): **psycho-functional ones, optic, phonetic, tactile ones** etc." Theo Van Doesburg, "The Ambiguous Mentality; Factory and Home," *Het Bouwbedrijf*, Vol. 2, no. 5, (May 1925), pp. 197-200, reprinted in *On European Architecture*, Van Doesburg, p. 59. Italics are original. Emphases are added.

[505] Giedion, *S.T.A.*, p. 785.

[506] He exemplifies Eiffel Tower of 1889 as the first use of elevator system on a great scale: "An unusual traffic problem was solved by constructing a whole system of elevators." Giedion, *S.T.A.*, p. 211.

[507] "The modern problem of city planning contributes substantially both to the modern traffic problem and to the modern dwelling problem. Increasing automobile traffic, aggravated by growing mass production of cars which are selling at steadily diminishing prices (Ford, Fiat, Citroën, etc.), will in the foreseeable future cause traffic jams which are bound to have catastrophic results, particularly in the old quarters of the cities. In nearly all large traffic centers breakthroughs and widening of the high-ways are presently being undertaken. (...) These air cities, though, are too redolent of castles in the sky to be taken seriously with respect to architecture... So: idealism, which does not solve the problem of the so-called *traffic architecture.*

America cannot help us here. We know that the traffic in the centers of New York is just as bad as in the old European cities: Rome, Paris etc. It is also obvious that the same cities which once accommodated quiet pedestrian traffic, are not suitable anymore for countless numbers of automatic transportation vehicles, competing in **a nervous tempo for record speeds**.

and the CIAM congresses, presentation of traffic as the new reality of modern life has been influential upon both.

For the front cover of the typescript of the first American edition of *Space, Time and Architecture* in 1939, instead of the image of stars turning around the sky at night representing universe and infinity, Herbert Bayer's book jacket design composed of two constituent facts as "close contact with nature" and "highway"[508] is published (Figure 4.30, 4.31, 4.32 and 4.33).

It is very well possible, and can almost be assumed for certain that air traffic, being used more and more (even for circulation within the cities) will effect an essential change in the development of traffic. As a result, city planning will have to develop into another dimension. The 'roof becomes 'façade'. The 'street' can develop in several levels (floors) on top of each other, according to the requirements of the traffic.

The Italian architect Sant' Elia was the first one to crystallize this idea in his extraordinarily brilliant projects for the Città Nuova (1915-1914). There is an unmatched confidence in these designs, which are only now being appreciated at their true value, and beside which the arid urbanistic projects of Le Corbusier-Saugnier pale into nothingness. The traffic architecture of the former is conceived completely organically, and created out of a sound understanding of the evolution of all traffic functions. Internal and external traffic (elevator, train, streetcar, aeroplane) combined in such a way that every transformation of the city itself remains possible. The great and real value of these projects lies in this possibility of an evenly balanced extension or transformation of traffic and city; they were created before anyone had even an inkling of such a fast growing traffic tension. At present, now that the latter is threatening city development, we gladly forget the romantic rudiments of these projects and take them for what they are: *documents of an organic traffic architecture.*" Van Doesburg, "The Quest for a New Traffic City; Sant'Elia, the Forerunner", *Het Bouwbedrijf*, vol. 4, no. 9, (April 1927), pp. 217-220, reprinted in *On European Architecture*, pp. 147, 149. Italics are original. Emphases are added.

"Just as utensils, which from a cultural viewpoint are the most important, owe their shape to the function that engendered them, the new image of architecture will likewise owe its emergence to the modern *life function.* It is unquestionably true that the life-tempo of modern man is totally different from that of his medieval predecessor, living in a noiseless atmosphere — a life that in no way corresponds with ours anymore.

The architectural documents from that time show us clearly that the awareness of 'time' and the corresponding tempo of life were totally different from ours. We still see that in the extant works of architecture, in Germany and Holland as well as in France; they contrast markedly with the striking speed of our modern traffic.

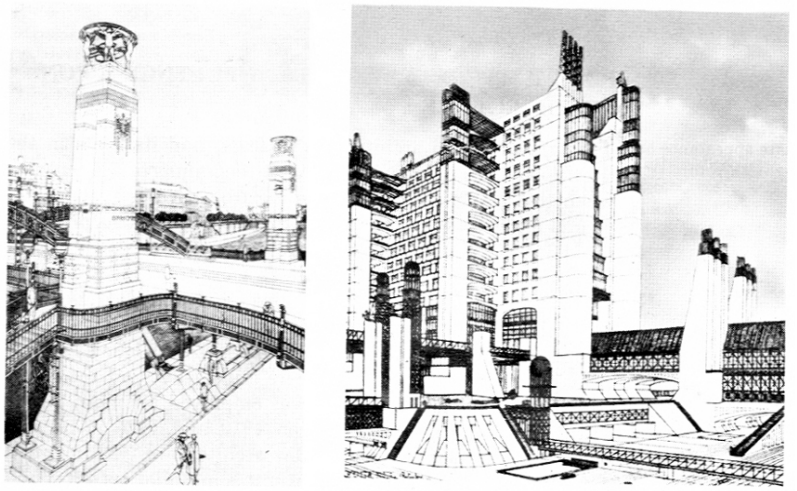
The medieval churches in particular appear in their construction and outer appearance to have retained the silence of the life-tempo during that time. The monumentality of the Renaissance, but the Baroque to an even larger extent, encroached upon this quality.

The life tempo changes constantly according to inner cultural motivation, and architecture is only genuine when it is an expression of the cultivated awareness of time. It is a copy when it tries to mold an earlier life culture, long dead, into concrete form." Van Doesburg, "The Significance of Glass", *Het Bouwbedrijf,* vol. 2, no. 6, (June 1927), pp. 225-227, reprinted in *On European Architecture*, pp. 63, 67. Italics are original.

[508] For the new cover design of Giedion' book Herbert Bayer places a photograph of the cloverleaf part of the highway at Randall's Island in New York City above the illustration of the garden of Versailles Palace that represents understanding of infinity in the Baroque era. In this collage design of Bayer, the new "spatial-temporal awareness" caused by the automobile that eliminates pedestrian movement, appears to have been represented as a new aspect. On the other hand, while in the first cover design of the book the concept of Space-time expresses the sky representing the universe and its infinity, the emphasis in the last cover design was on the highway as an a new architectural expression of continual dynamism and movement of Modernity within space-time's universe and its infinity: "A more cynical example of the reuse of imagery is that of **the highway that vectors toward infinity**,

In the supplements he has added to the last and fifth edition of *S.T.A.*, Giedion keeps adding new meanings to the Space-time concept by emphasizing the "new spatial-temporal awareness" entailed by automobile and moving within. In his opinion of being different from the previous, the perception of the mobile observer has changed because of the automobile:

> "This can be accomplished only by separating them. Hausmann's endless streets belonged not only in their architectural features but also in their very conception to the artistic vision born of the Renaissance: **optical perspective**. Today we must deal with the city from a new aspect, dictated by **the advent of the automobile, based on technical considerations, and belonging to the artistic vision born out of our period— space-time**"[509]



191. OTTO WAGNER. Drawing for bridge, subway, and different street levels, Vienna, 1906. *Part of a system of elevated and underground railway lines encircling Vienna along its outskirts.*

192. ANTONIO SANT' ELIA. Project for a subway, 1914. *Different street levels, combined with apartment houses and elevators. Sant' Elia's Nuova Città reflects the futuristic delight in intersecting streams of movement.*

Figure 4.29 Aestheticization of the speed and the uninterrupted traffic flows in Antonio Sant' Elia's *Nuova Città* project of 1914 and in Otto Wagner's project of the multilayered traffic system for Vienna of 1906. Accompanying text to Antonio Sant'Elia reads, "Different street levels, combined with apartment houses and elevators. Sant' Elia's Nuova Città reflects the futuristic delight in intersecting streams of movement." From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), p. 321. Fig. 191, 192.

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first used by Bayer in his photomontage of Hitler and the autobahn in the catalog *Das Wunder des Lebens*. Six years later the same motif reappears on Bayer's book jacket for Giedion's *Space, Time and Architecture*." Ockman, "The Road Not Taken," p. 111. Italics are original. Emphases are added.

[509] Giedion, *S.T.A.*, p. 822. Emphases are added.

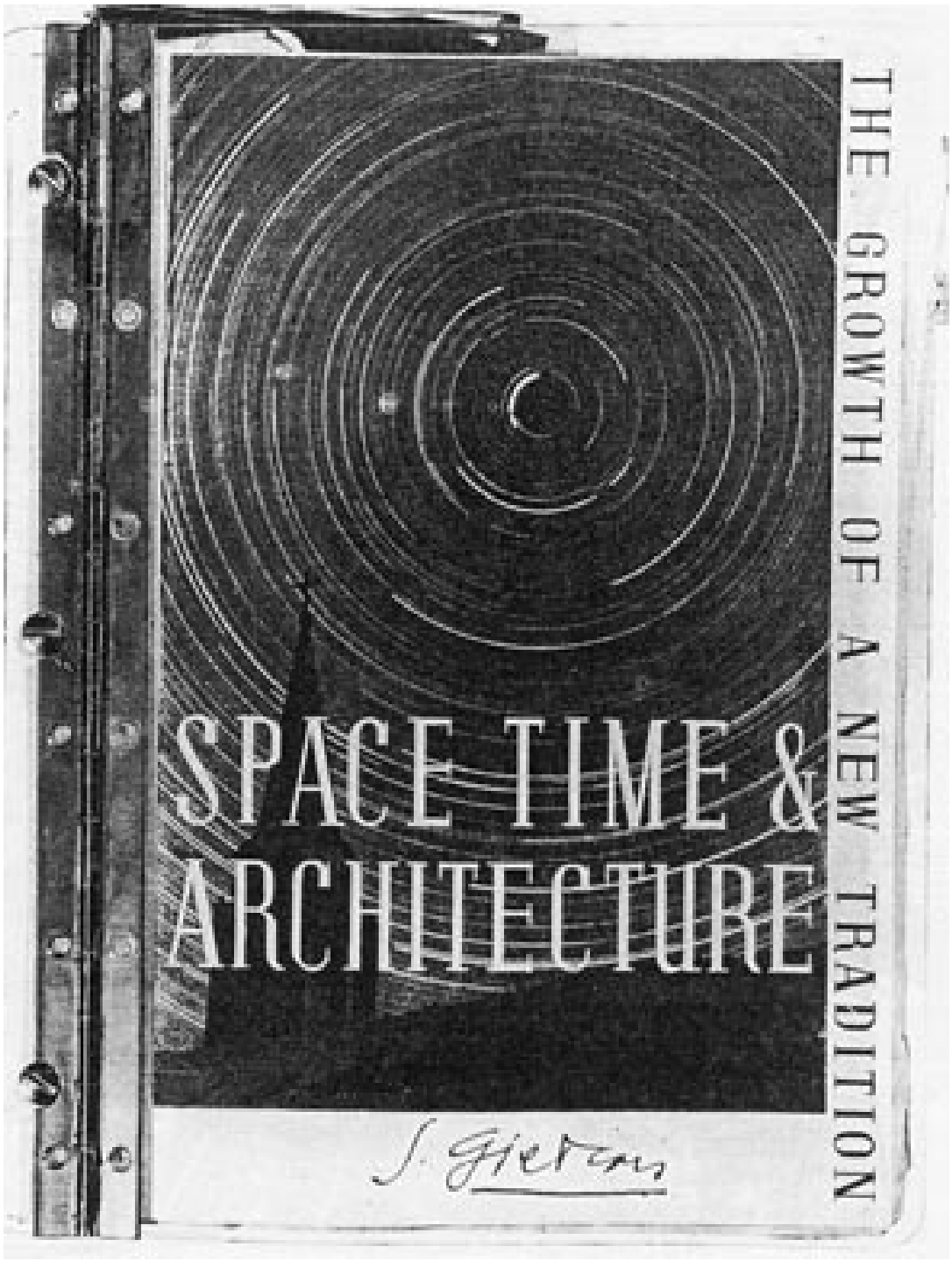


Figure 4.30 Front cover of the typescript of the first American edition of *Space, Time and Architecture*, as submitted to Harvard University Press on 24 November 1939. Giedion Archive in GTA Zurich. From *Sigfried Giedion; An Intellectual Biography*, Sokratis Georgiadis, (1993), p. 96.

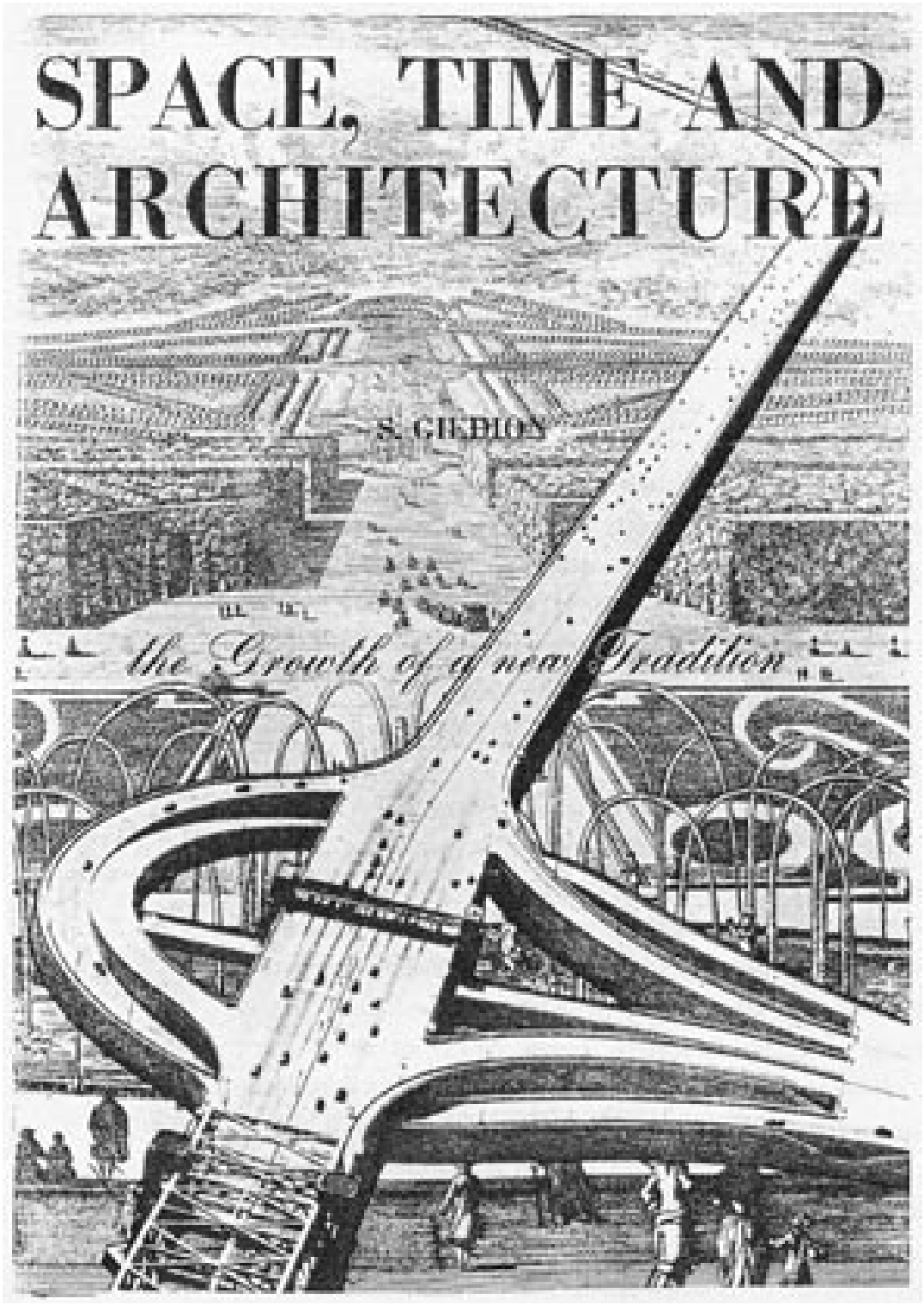
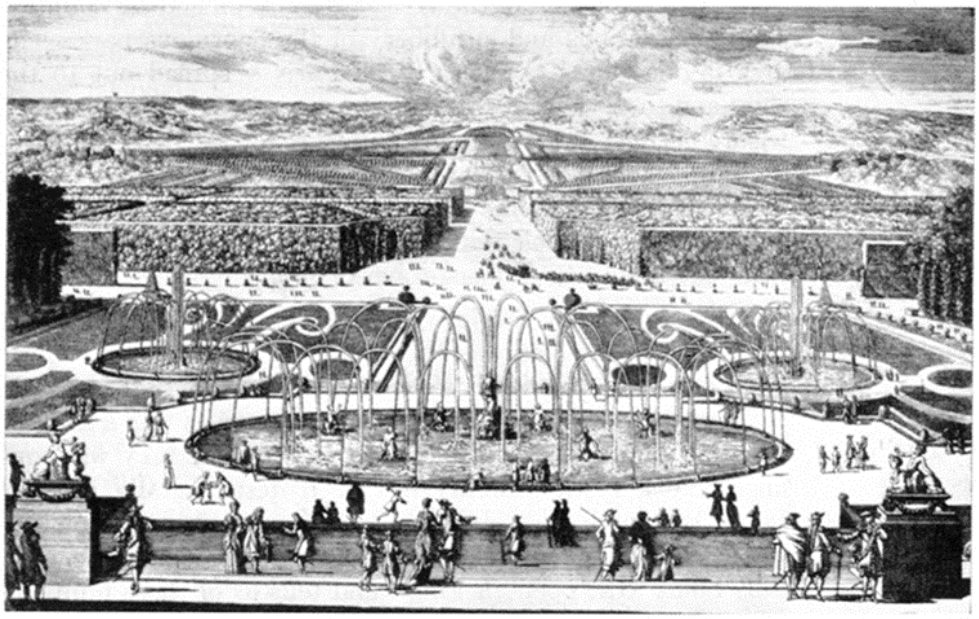


Figure 4.31 Herbert Bayer's cover design of the first American edition of *Space, Time and Architecture*. From *Sigfried Giedion; An Intellectual Biography*, Sokratis Georgiadis, (1993), p. 98.



67. Versailles. The gardens, the "Tapis verts," the Grand Canal, and the terraces. *Engraving by Perelle.*

Figure 4.32 Giedion's interpretation of Baroque Infinity represented by Versailles Palace as "close contact with nature," and the endless "Grand Canal" like as Highways. From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), p. 139.

Figure 4.33 Enlarged detail photograph of the cloverleaf in Randall's Island in NewYork City in 1936. Having been chosen by Herbert Bayer to utilize in the book jacket design of the *Space, Time and Architecture*, the photograph of cloverleaf part of the highway represents the modern understanding of infinity, expressed by Giedion as modern "spatio-temporal awareness." From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), p. 828

> "These bridges, their mounting drives, and the modern sculpture of numberless single or triple cloverleaves proved that the possibilities of a **great scale** were inherent in our period. **As with many other creations born out of the spirit of this age, the meaning and beauty of the park-way cannot be grasped from a single point of observation**, as was possible when from a window of the chateau of Versailles **the whole expanse of nature** could be embraced in one view. **It can be revealed only by movement, by going along in a steady flow as the rules of the traffic prescribe. The space-time feeling of our period** can seldom be felt so keenly as when **driving**, the wheel under one's hand, up and down hills, beneath overpasses, up ramps, and over giant bridges."[510]

> "**Modern traffic**, for example, educates and sharpens our sense of space. City-dwellers **moving** across congested avenues seem almost to know what **is taking place behind them**. This kind of **spatio-temporal awareness** was unknown in baroque times; it may be a case of the redevelopment of a primitive sense."[511]

Interested in new "large scale" of city planning with the impact of CIAM congresses, Giedion finds out the origin of flexibility and freedom in large scale in the plan of Amsterdam initiated by Berlage which will be later applied to other cities like Chandigarh:

> "The plan of Amsterdam involves no attempt at clearing out slums in the center of the city: it establishes a new town on its outskirts. And the **freedom and flexibility** of the scheme are not hopelessly constricted by the *rue corridor* or the gridiron system. **The conception of space-time — the basis for a contemporary town planning** — can already be felt in the 1934 extension plan for Amsterdam."[512]

In Giedion's opinion, "Group Design" criteria grounded on the idea of flexibility and freedom brought by "separation of pedestrian and vehicular traffic" and "sculptural entities surrounded by free space" floating on greenery, Le Corbusier's unrealized Paris Plan designed in 1937, competition held for the replanning Berlin's city center in 1961 and Chandigarh Plan, are the projects which has been solved the problem of "large scale" planning successfully. For this reason, he depicts Chandigarh plan as an expression of Space-time:

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[510] Giedion, *S.T.A.*, pp. 826, 831. Emphases are added.

[511] Giedion, *S.T.A.*, pp. 817-818. Emphases are added.

> "The use of a **new and larger scale** in town planning which would coincide with **the scale of a parkway system** is still an imperative necessity for the creation of the city of the future. **This scale** is closely connected with the **space-time conception** of our period."[513]

Giedion describes Robert Maillart's bridges as "pure plastic expression," where curved planes consisting of two constituent facts like "plane" and "curvature form" are used.[514] He also regards the highways and bridges made up of curved slabs, similar to those of Maillart's, as being "modern sculpture" and "solutions to the problem of division and crossing of arterial traffic" (Figures 4.17 and 4.34).

> "Randall's Island, cloverleaf, with approach to Triborough Bridge, New York City, 1936. Such bridges, with broad drives leading up to them and **the modern sculpture of numberless single or triple cloverleaves**, proved that **the possibilities of a great scale** were inherent in our period. **Expressive of the space-time conception both in structure and handling of movement**."[515]

Claiming in the Foreword that his book begins with "the similarity of methods that are in use today in architecture, construction, painting, city planning and science,"[516] Giedion constructs the Space-time conception via the similarities he aims at setting up. In this manner, such similarities like interpenetration, post-perspectivalism, and dematerialization between the spatial effects of engineering structures, post-cubist art, modern sciences and *Neues Bauen* are termed by him as "Space-time."

He interprets the scientific concept of Space-time, with peculiarities of dynamism, relativity, simultaneity, freedom and transformative forces between the new subject-object relationship, in order to overcome authoritarian perspective and to present it as representation of the "newness" in the fields of art and architecture. Just like Detlef Mertins expresses as "In contrast to the graphic rules of perspective, he presented space-time as a phenomenology of spatial perception in the unrepresentable, yet for him

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[512] Giedion, *S.T.A.*, p. 813. Italics are original. Emphases are added.

[513] Giedion, *S.T.A.*, p. 845. Emphases are added.

[514] Giedion, *S.T.A.*, p. 461.

[515] Giedion, *S.T.A.*, p. 828. Caption of Fig. 506. Emphases are added.

[516] Giedion, *S.T.A.*, p. vi.

scientific, fourth-dimension in which inside and outside, subject and object, space and time were considered interwoven,"[517] Giedion constructs the relationship among Space-time with mobility, higher reality and fourth dimension, to make "unseen" and "hidden reality" to be perceived;

> "To a previously unknown extent, outer and inner space are interpenetrating. This effect can only be experienced in descending the spiral stairs [of Eiffel Tower] from the top, when the soaring lines of the structure intersect with the trees, houses, churches, and the serpentine windings of the Seine. The interpenetration of continuously changing viewpoints creates, in the eyes of the moving spectator, a glimpse into **four-dimensional experience**."[518]

506. Randall's Island, cloverleaf, with approach to Triborough Bridge, New York City, 1936. *Such bridges, with broad drives leading up to them and the modern sculpture of numberless single or triple cloverleaves, proved that the possibilities of a great scale were inherent in our period. Expressive of the space-time conception both in structure and handling of movement.*

828

Figure 4.34 The cloverleaf in the Randall's Island in New York City in 1936. From *Space, Time and Architecture*, Sigfried Giedion, (1967 [1941]), p. 828.

[517] Mertins, "Transparency Yet To Come," pp. 31-32.

In his later editions of his book, Giedion defines Space-time via the relationship between the "large scale," providing freedom, flexibility and individuality and "individualities" providing totality in the theoretical framework of design criteria within the Group Design model. Space-time is also implied as mentally constructed reality rather than being visual, with new awareness and means of expression that of displacement, non-placeness and visual deformation caused by the effect of automobile and speed. Giedion presents the method of abstraction and alienation as Space-time that he has developed in order to attain both to new reality itself which is formed by integrated fragments and to hidden and unseen realities. Owing to his Hegelian approach, to overcome the duality between the objective and subjective notion of time in philosophy, Giedion unusually addresses to scientific space-time concept as a synthesis.

As long as he transforms his book *Space, Time and Architecture* by different editions, Giedion transmutes the meaning of Space-time into an over-proliferated content, i.e., meta-meaning, attributing architectural, urban, aesthetic, moral and social values to constituent facts which he has continuously selected from modernization process.

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[518] Giedion, *S.T.A.*, p. 284. Emphases are added

CHAPTER 5

CONCLUSION

This dissertation explores how the architectural historian-critic Sigfried Giedion has written the history of Modern architecture as much as how he has transposed the time concept into the field of architecture based on his invention of Space-time concept.

Positioned as an avant-gardist historian-critic, the way Giedion has characterized "Modernism" by determining the boundaries and writing the selective history of Modern architecture, has been scrutinized. The dissertation also denotes how, within this characterization process, Giedion has constituted his Space-time concept as a "therapeutic apparatus" of Modernity as much as a "constituent fact" of Modern architecture.

In Giedion's works, in which he has conceptualized the proposed new spatial paradigm together with the art-historical space theories, the post-Cubist and a-perspectival theories of modern space conception, and the sources in receptions of the idea of space and of time have been examined. The examination also points out the way Giedion has utilized the movement characteristic between subject-object relationships of the 19th century art historical space conception to designate the modern space conception he called as "Space-time" of the 20th century. Primarily the way Giedion has rendered mobilization as the dominant characteristic of the modern subject and secondly, how he characterizes the modern space by displacing and dematerializing impressions of "the movement of the air" have both been presented in detail. Suggesting for a dynamic subject-object relationship, Giedion's way of setting the time concept forth in order to justify his discourse has been discussed. Regarding to this justification, the dissertation has provided detailed consideration of the references that Giedion has given to different time conceptions in a wide range from philosophical theories of the Antiquity to Einstein's Relativity theory in the field of physics, from pseudo-scientific and esoteric literature examples to theories of non-Euclidean geometry in mathematics. It is emphasized that the most argumentative source of Giedion's space-time conception has been the parallelism he has constructed among architecture, Cubism and the Relativity theories. In constructing this parallelism,

Alexander Dorner has been the most important name running the patronage of European avant-gardes owing to his directorship in Landesmuseum-Hanover during the first quarter of the 20th century. In this study, their disputatious and tensional relationship has been of elaborate consideration. Although he has appreciated Cubist painting more than Purism under the influence of Dorner, it is also denoted how Giedion has adapted the characteristic of "marriage of the contours" in Purist painting, and the characteristics of incorporeal, "contour" and "perforable" attributed to 19th century iron constructions both to architectural mass and volume, constituting them as characteristics of the modern space conception.

Stress has been laid on the instrumentalizing power of "operativeness," which has been widely used in pastoral interpretations of Modernity and in the early historiography of Modern architecture, being labeled upon Giedion in a cursed manner, upon the concept of Space-time. Under the effect of "operativeness" as an instrument, the influential power of Giedion's historiography upon the reader and the rhetoric in his other writings, with the way he has transformed this influential power into the persuasion mechanisms of propagandist narrative techniques such as parallelism and analogy in his book S.T.A., have been analyzed. Thanks to these techniques and mechanisms, the existing meanings of concepts and images have been expanded primarily through gaining ambiguity to abandon their conventional meanings, then by being equipped with new allusions and meanings, and finally via transformation of the book into *Gesamtkunstwerk* [the work of art] have been explored.

According to Giedion, the dynamic and chaotic modern life with such characteristics as traffic and its effects of speed, dynamism of modern life…etc. causes novelty of fragmented reality due to the multipoint view, fragmentary images, facetness…etc. In this sense, even though all sort of attempts of Giedion involving instantly and holistically a serious critique of Modernism within, overall remain to be a futile "synthesis" by virtue of the claim of "Unity" that conflicts the fragmentary and ephemeral characteristics of Modernity. In Giedion's opinion, what will synthesize through re-unifying Reality which has been transformed into fragments and thus rendered as plural by Modernity, paradoxically, is the concept of time being the most important instrument of Modernity.

The dissertation denotes Giedion's paradoxical reception of Modernity within a holistic approach that entails new socio-cultural unity. Owing to the mentally constructed characteristics of Space-time, Giedion proposes a "self-evident" characteristic and meaning to be produced and consumed by the subject, i.e., individual, taking the place of the meaning that is produced, transferred, circulated and consumed by society. However, this state of "self-evidence" paradoxically produces fragmented, relative, subjective and multiple realities conflicting with the unity of reality, as what Giedion has been in search of. Due to the receptibility of the unifying theory of Space-time only via subjectivity, Giedion conflicts with his previous statements by re-producing the splitting, fragmenting and specializing characteristics of Modernization process.

In relation to his special interest in "present" and "future" periods and the related phenomena, it has been emphasized in this dissertation that Giedion has opened such a historiographic channel that is different from his precedents in art history. Giedion's role has also been discussed as a forerunner in constitution and justification of a historiography of architectural Modernity as much different from that of art history. Though not the role of architectural historian and the historiographic model for the Modern architecture he has suggested, but the after-effects of the conceptions he has constituted and the theoretical contributions he has made are still valid in our day.

As a result, in an effort to determine the boundaries and characteristics of Modernism, Giedion not only ideologically brings together plenty of unrelated texts and images, but also in context of his *Telos* of Unity, he instrumentalizes those concepts and theories which are transposed and misread in an impetuous manner that was fashionable in many early modernists. In this dissertation, effort has been spent to demystify and deconstruct the "operativeness" that Giedion has constructed as a cause of this instrumentalization based the concept of Space-time.

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VITA

Deniz Güner is born in Izmir, on March 10, 1971. He received his B. Arch. Degree from Yıldız Technical University in July 1992 and his M. Arch in July 1995. He has been teaching in Izmir Institute of Technology, Department of Architecture, as a research assistant from 1998 onwards. He has won the first prize at the competition HABITAT II Student Competition in 1996. His publications include:

- Güner, Deniz; Duruk, Kıvılcım and Özkut, Deniz; "An Experiental Re-Construction of a Fragmented Collected Memory in a Modernist City, Izmir, By Means of Architectural Education," UIA (Union Internationale des Architectes), Alexandria 2003 — "Architectural Education for the New Millennium — Issues, Innovations and Tradition," Alexandria – Egypt, 08-10.03.2003, To be published in Proceedings.

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