FORM FOLLOWS WHAT?

The modernist notion of function as a carte blanche

By Jan Michl

Jan MICHL, *born 1946 in Czechoslovakia, has lived in Norway since 1981. He studied art history, languages and economic history at Uppsala University in Sweden (fil kand) and at Purkyne / Masaryk University in Brno, Czechoslovakia (PhDr). In the 1970s he worked at the Institute for Theory and History of Art in Prague, Czechoslovakia. From the early 1980s he has taught history and theory of industrial design at the Department of Industrial Design, National College of Art and Design in Oslo, Norway, since 1990 as associate professor. Between 1987 and 1989, he worked on his research project Functionalism as a dream of objective design, funded by NAVF, the Norwegian Council for Sciences and the Humanities. He is currently Visiting Associate Professor in industrial design history and theory at the Faculty of Architecture and Town Planning, TECHNION, in connection with the new graduate Industrial Design Program.*

INTRODUCTION

The aim of this essay is to shed light on the modernist credo *form follows function*. It seems that what we make of this credo makes a difference with regard to many areas pertaining to design, including the question of design education. Taking the credo, or dictum, *form follows function* as the gist of the modernist design principle, I would like to pursue the following question: was the dictum ever feasible as a design precept promising to bring an end to formalism? The answer of the exponents of the modernist philosophy of design was an unequivocal 'yes'. They claimed their architecture and design were not a result of stylistic intentions, but of a new design principle. If we happen to agree, our writing regarding modernist architecture and design is reduced to repeating, or at best embellishing upon, what modernists said about themselves. On the other hand, if we deem this design dictum not feasible, we have to suggest an alternative reading of their architecture and design. In parallel, if we hold the *form-follows-function* dictum as a feasible precept, we have a case for keeping in place the Bauhaus-based 'exampleless' design pedagogy (1) which in many ways still dominates design education. If we don't, we may be facing a major restructuring.

In the past twenty to thirty years modernism has been exposed to a variety of criticism, from long-suffering to vitriolic (2-12). Both the history of modernist architecture and modernist design theory have gone through a series of attempts at radical revisions. Today it is more or less taken for granted that neither architects and designers, nor engineers (13, 14), ever begin - or can ever begin - from a clean slate, i.e. only from the problems *at hand*. Examples, models, paradigms, and solutions from the near or distant past, play an important role in the process of design, as well as in design education (there is no general agreement about the way they do). Reyner Banham's judgment that the dictum *form follows function* is an 'empty jingle' (2) is more or less taken for granted today. Despite recent attempts to substantiate such judgment (13, 15) a basic, rather puzzling question remains: how could an empty jingle ever have preoccupied several generations of architects and designers? The discussion and conclusions offered in this essay build on the insights of several authors who in my view succeeded best at penetrating the core of the matter (16-24).

THE BIRTH AND CHILDHOOD OF THE DICTUM FORM FOLLOWS FUNCTION

Let me begin this discussion by an outline of the historical background of this elegant three-word resumé of functionalism, or modernism (for the purpose of this discussion I use the two terms interchangeably).

The dictum *form follows function* was coined by the American architect Louis Sullivan in an article published in 1896, almost exactly one hundred years ago. It became a catchword in the United States in the mid-1930's, and in the late 1940's in Europe as well.

In that article Sullivan presented his approach to the emerging building type he referred to, in the manner of the time, as 'the tall office building' soon to be called the 'skyscraper'. In connection with arguing for his tripartite concept of skyscraper design and for the upward character of the structure, Sullivan argued that his design was a 'natural' result of an all-pervading law. First he formulated this alleged law in general terms: *"It is my belief"*, he wrote, *"that it is of the very essence of every problem that it contains and suggests its own solution. This I believe to be natural law. Let us*

Louis Sullivan. Drawing for plaster ornament, 1890-1891.

examine, then, carefully the elements, let us search out this contained suggestion, this essence of the problem".

Later in the text, prior to the three-word summary of that law, he wrote: *"All things in nature have a shape, that is to say, a form, an outward semblance, that tells us what they are, that distinguishes them from ourselves and from each other. -- Unfailingly in nature these shapes express the inner life, the native quality, of the animal, tree, bird, fish, that they present to us; they are so characteristic, so recognizable, that we say, simply, it is 'natural' it should be so. (...) Unceasingly the essence of things is taking shape in the matter of things, and this unspeakable process we call birth and growth. (...)"*

Finally Sullivan comes to the ornate, Whitmanesque passages where he formulates his dictum, the *"final comprehensive formula"* as he put it: "*Whether it be the sweeping eagle in his flight or the open apple-blossom, the toiling work-horse, the blithe swan, the branching oak, the winding stream at its base, the drifting clouds, over all the coursing sun, form ever follows function, and this is the law. (...) It is the pervading law of all things organic and inorganic, of all things physical and metaphysical, of all things human and all things superhuman, of all true manifestations of the head, of the heart, of the soul, that life is recognizable in its expression, that form ever follows function. This is the law. -- Shall we, then, daily violate this law in our art? Are we so decadent, so imbecile, so utterly weak of eyesight, that we cannot perceive this truth so simple, so very simple? (...) Is it really then, a very marvelous thing, or is it rather so commonplace, so everyday, so near a thing to us, that we cannot perceive that the shape, form, outward expression, design or whatever we may choose, of the tall office building should in the very nature of things follow the functions of the building (...)?"(25)*

The dictum was mentioned by Sullivan himself five years later in his "Kindergarten Chats", a series of 52 socratic-like dialogues between a wise architect and his inquisitive student, published as weekly installments in a US architectural journal. The fact that the dictum did not figure more prominently in the Chats may have had to do with the fact that it was explicitly challenged half a year after its publication in 1896, in a speech and an article by Sullivan's former long-time partner Dankmar Adler (26), with whom Sullivan fell out at that time. Later, in the 1910's, the dictum was quoted approvingly by several architectural writers discussing Sullivan's work. Sullivan himself drew attention to it again in his memoirs of 1924, under the ostentatious title *The Autobiography of an Idea.* There the dictum was mentioned as the hub of his design philosophy. Sullivan wrote that in the beginning of the 1880's he was putting to the test a formula which he had evolved *"through a long contemplation of living things, namely that form follows function, which would mean, in practice, that architecture might again become a living art, if this formula were but adhered to."* (27)

The dictum seems to have became a slogan of modernists in the US only in the mid-1930's, after the 1935 publication of the first Sullivan biography written by Hugh Morrison (28). A year later, in a book on American industrial design, Sullivan was referred to as the "*author of an overquoted axiom about form and function*" (29). The slogan seems to have been imported to Europe in the late 1930's with the British publication of C.W. Behrendt 'book *Modern Building*' (30), first published in the US (31), where not only Sullivan but also his predecessor Greenough were enthusiastically discussed. From that time on, Sullivan's dictum started to be used as a shorthand summary of the ambitions of modernist architecture and design. It summed up the modernist claim that the Modern Epoch was pregnant with new forms, and new aesthetics intrinsic to this Epoch, and implied that the primary duty of the modernist designer, over shadowing all his other duties and loyalties, was to serve as a kind of midwife (32) for this new objective aesthetics, independent of anybody's taste preferences.

MODERNISTS ADOPT THE NOTION OF FUNCTION

Although Sullivan was the father of the dictum it was not he who introduced the notion of function into architectural discourse. It seems that the notion of function came to be applied to architecture sometime around 1750 in Venice, in the architectural doctrines of the Italian jesuit monk Carlo Lodoli (33, 34). Father Lodoli was an important figure in the cultural circles of Venice of that time (35). Among others he was the first to collect paintings of the Italian primitives, i.e. late Gothic and early Renaissance painters, at a time when these pictures were considered practically worthless (36). Lodoli was intensely interested in the theory of architecture and came later to be called the Socrates of architecture, not only because he repeatedly questioned the accepted architectural truths of the day, but also because he himself did not leave any architectural treatise. His ideas and theories survived thanks to two books, one written by Francesco Algarotti, one of his critics, and the other by his admirer Andrea Memmo (37, 38). According to these writers Lodoli was very critical of what he considered as overuse of ornament and decoration both in contemporary, and in much of the older architecture (this was the dawn of the neo-classicist reaction to rococo). According to one of these writers the cornerstone of Lodoli's teaching was the maxim that nothing should be put on show *(in rapresentazione)* that was not in function *(in funzione)*, that is, a working part of the structure (33). It is further probable that Lodoli also introduced the notion of *organic architecture* (33, 34), which for him was an

architecture based on functional, or rational, considerations . The Lodolian theories of architecture were included later in the 18th century in a book about famous architects written by Francesco Milizia (39). It was presumably through this popular book that Horatio Greenough (1805-1852), the American neo-classicist sculptor living in Florence, came to learn sometime in the 1830's or 1840's about Lodoli and his notion of function.

Being a neo-classicist, Greenough (34) spent most of his adult life in Italy. It is probable that he came also into contact with contemporary French natural sciences, especially with Georges Cuvier's works on comparative anatomy where the notion of function played a cental role. Greenough wrote several essays on architecture and design in the 1840s, in which he criticized contemporary historicism and argued for a program of reform in which the notion of function would play a central role. To exemplify his ideal he referred often to forms found in Nature, which he explicitly considered God's work. He claimed for example that *"God's world has a distinct formula for every function, and we seek in vain to borrow shapes; we must make shapes, and can only effect this by mastering the principles"*. He maintained that one of the most important principles found in nature, that human designers should appropriate and master, was *"the principle of unflinching adaptation of forms to functions"*. (40) Here we can note that Sullivan's later dictum form follows function expressed much the same principle, the main difference being that Greenough himself never hit on such a condensed, felicitously alliterative formulation.

Around the middle of the century the ideas expressed by Greenough were very much in the air in Europe as well. Both the French architect Violett-le-Duc and the German architect Gottfried Semper were influenced by George Cuvier's functional classifications, which informed much of the collections in Cuvier's Musée d'Histoire Naturelle in Paris, and both architects explicitly held these classifications and analyses as models for the study of buildings and useful artefacts (41). Their role as ideologists of a new architecture was, however, different from that of Greenough and Sullivan. In contrast with the latter two, who can be said to have been pure ideologists, both Violet-le-Duc and Semper brought off serious historical studies.

The architectural thinking of Greenough and Sullivan had an explicit metaphysical frame of reference. Both authors were influenced by their countryman Ralph Waldo Emerson, the principal representative of an American philosophical position known as transcendentalism. Poetic and speculative at the same time, this trend of thought had its roots in the German Romantic philosophy of Schelling and Hegel, mediated through the work of Samuel Taylor Coleridge. Greenough and Emerson met in the 1830s in Florence and continued their contacts in later years (42, 43). Emerson claimed to be interested in what he called "metaphysics of architecture" by which he meant an architecture that was a result of necessity, in contrast with architecture based on arbitrary and capricious choices. He was quoted as saying that "Nature which created the mason now creates the house" (44), an idea suggesting a sort of 'natural' architecture endowed with 'natural' forms (whatever that may have meant). Sullivan's architectural work and thought was also described as transcendentalist in a recent study (45).

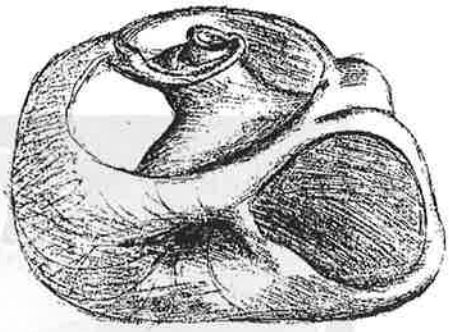
DO FUNCTIONS PRECEDE FORMS?

After this short historical survey, let us now take an analytic look at the notion of function. In the discussions about the dictum *form follows function* it was in the main the verb 'follows' that kept attracting attention (*does* it - *can* it - *should* it follow function?) while the word function itself was as a rule considered unproblematic. But is it really? The formula

form follows function hides a remarkable claim, namely that function comes before form, that it exists independently of form, that it is there before form emerges. Forms can be said to follow functions only if we consider functions to be entities that precede, and predate, forms. Only then does it make sense to urge the designer to make functions his starting point, to make forms follow functions.

But is there really such a thing as function that exists prior to form? No contemporary science, natural or social, uses the notion of function in the sense functionalist designers and architects did. No matter whether these sciences deal with material objects or immaterial phenomena, the scientific notion of function always refers to what an existing object or phenomenon does within a certain context. Whether we wonder about the function of the heart in human physiology, or the function of facades in a townscape, hearts and facades have to exist before anybody starts inquiring about their functions. In both natural and social sciences form predates function: the notion of function is born from observing existing forms or phenomena. In functionalist design theory, on the other hand, it is exactly the other way around: function is claimed to predate form.

Sullivan conceived his dictum as all-pervasive natural law. It is important to stress that the dictum is difficult to square with the darwinian (or neo-darwinian) explanation of functional adaptations in nature, as has been recently pointed out by architectural historians (46, 47). The darwinian theory of natural selection is mechanistic, not teleological; it does entirely without postulating an intending, designing agent. According to this theory, small incidental variations among offspring of the same family make their adaptability to a particular habitat slightly better or worse. Those better adapted have more chance, through no effort of their own, to survive, reach adulthood and have offspring, and these offspring in turn are exposed to natural selection. The particular habitat functions as the selecting factor. The darwinian interpretation of what we perceive as purposeful phenomena in nature is apparently an argument against, rather than for, the Sullivan formula. According to contemporary biology, forms or rather small incidental modifications in forms always appear first, while function, i.e. the functional exploitation of the modified forms, emerges afterwards - if at all. The astonishing functional adaptations found in nature are not explained by reference to beneficial fiats of a Higher Intelligence but by reference to the habitat-related mechanism of natural selection. If architects and designers were to take seriously the modernist exhortation to follow principles found in nature, the mechanism of natural selection would then suggest, paradoxically, the opposite of what the modernists propounded: not that designers should start from 'function' and arrive at the only possible formal solution pertaining to such function, but rather that they should start from forms and see how any of them could be used to solve the task at hand.



Le Corbusier.
Study of a shell, 1937.

It should be noted that Greenough wrote before Darwin's theory of natural selection appeared on the scene, and that Sullivan wrote when darwinism was temporarily in shambles. Darwinian biology was consolidated only in the 1930s and 1940s (48). In other words, neither Greenough and Sullivan nor later functionalists can really be accused of having misunderstood modern biology. This however does not mean that pre-functionalist and functionalist design philosophy had the bad luck of following too closely an erroneous understanding of nature during its own time. No modernists of the 19th or the 20th century were unwitting followers of either pre-scientific or scientific concepts of the day (49). There seems to be a good deal of vested interest in embracing these theories, as I will argue below.

ARE THE NOTIONS OF FUNCTION AND PURPOSE SYNONYMOUS?

It could be objected that there is no intrinsic reason why the notion of function as used by architects and designers should conform to that of scientists, and that there is a good reason why it does not since scientists qua scientists are observers while architects and designers are doers, makers of things. The latter's notion of function, the argument could go, can be reasonably expected to stand closer to the doer's notion of purpose than to the observer's notion of function. And indeed to begin with, the functionalist notion of function seems to be employed as a synonym for 'purpose'. Could this be the reason why function is considered to precede form? We know that both pre-functionalists and functionalists of the period between the First and Second World Wars used the notion of function and the notion of purpose more or less interchangeably, and that is to some extent also the case in the design discussions through our own day. We further know, that even in our day-to-day language we use the notion of function in two different senses, one of which is synonymous with 'purpose'. When speaking, for example, about the function of car tires, we may have in mind the original intention with which they were produced, that is securing

a soft, quiet and safe ride. Alternatively, we may by function mean their factual performance, i.e. how the tires perform, independently of the original intention. We may then find that they not only fail to fulfill thoroughly the intended objective, but that they in addition produce a lot of unintended things: they wear out, are exposed to punctures, are extremely laborious to change, create severe disposal problems, etc (50).

Let us call these two different meanings of the notion of function the *intended functioning* and the *factual functioning*. *Factual functioning* would then refer to what scientists have in mind when they use the term function: what something (a form, a phenomenon) does, or how it behaves or performs, no matter whether that was or was not the part of an original intention or, indeed, whether there was any intention at all. On the other hand, the notion of *intended functioning*, would be only another word for *purpose* or *intention* - i.e. a word referring to what someone intends a form to be used for.

What then can we make of the notion of function as used in Sullivan's dictum? It is obvious that form follows function cannot be understood as 'form follows *factual functioning*' because the statement would simply make no sense; it is evident that factual functioning refers to the performance of a form, which must be there prior to the factual functioning.

Can 'form follows the *intended functioning*'- or simply 'form follows *purpose*'- be the true meaning of 'form follows function'? In the designer's world the intention, plan or purpose is always there before the form is created. Products are always conceived, designed and manufactured with this or that purpose in mind. Unfortunately, 'purpose' does not seem to fit here either. If we choose to understand Sullivan's dictum as suggesting that forms of buildings and products should follow the purpose the buildings and products are intended to be used for, we have a reasonable statement - but it is trivial. Could this have ever become a battle-cry? Could anybody have ever bothered to disagree with such a goal? The main problem, however, is that if we choose to understand the dictum this way, its most intriguing dimension - namely its promise of objective forms, forms independent of both the user's and the designer's aesthetic preferences - will disappear. And as the vision of the objective-because-intrinsic forms vanishes, the whole functionalist criticism of historicism and eclecticism in architecture and design, in fact the whole functionalist moral superiority, looses its footing. The reason for that would be that if we start speaking of *purposes* of buildings and products, it is obvious that purposes of things are purposes of humans, that purpose is simply a word referring to someone's wishes, demands and preferences. The idea that form follows human wishes, demands and preferences could hardly be taken for a new design principle entirely different from those of the 19th century. There is little doubt that in any neo-baroque facade of the last century the forms followed purposes in this sense.

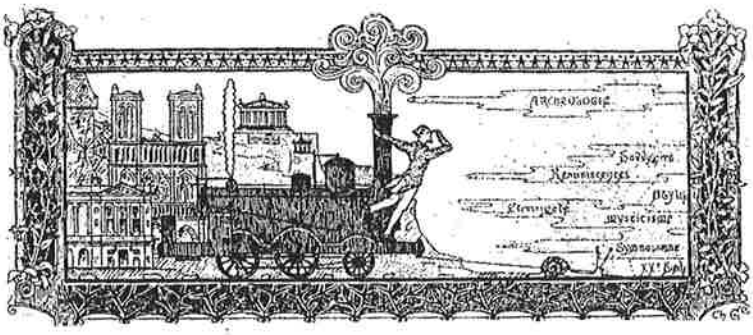
We have to conclude, therefore, that 'purpose' (or 'intended functioning') can hardly be the true meaning of the functionalist notion of function because functionalism stands and falls with the idea of an objective starting point of design. Were it not for that allegedly objective starting point claimed to be entirely independent of our subjective wishes, demands and preferences, functionalists could hardly insist, as they did, that they were coming forth with a radical alternative to historicism and eclecticism. Without such an objective starting point functionalism would be merely a change in style.

Unless, of course, the notion of function is taken to refer not to purposes of flesh-and-blood humans, but to Purposes with a capital P.

FUNCTION AS A KEY NOTION IN THE FUNCTIONALIST METAPHYSICS OF DESIGN

Indeed, the key to the functionalist notion of function seems to be the finding that the notion does not refer to any common sense concept at all, and that it is a denizen of a separate reality. Since this separate reality is part and parcel of the functionalist design philosophy, I will refer to this philosophy as *functionalist design metaphysics.* Although some writers did touch upon the metaphysical dimension of modernist thinking when referring to Plato in connection with functionalist architecture and design (3, 51-54), this side of functionalism has until recently (45, 55, 56) remained largely unexplored. Excepting David Pye's critical observations (17), architectural writers including most of the recent ones (8, 46, 57-60) still tend to interpret the notion of function as a direct or indirect reference to use and the world of common sense users.

Our contention is that the notion of function as employed by functionalists, is not a word for what a flesh and blood person in fact wants a building or a product to do, or look like. Rather, it is a word for what the person *should* want a building or a product to do, or look like, according to the putative demands of ambiguous entities such as 'Modern Epoch'. Once one becomes alert to it, it is not difficult to discover that not only the pre-functionalist writings of Greenough and Sullivan but all of the modernist design philosophy is set in a time-honored metaphysical framework. Pre-functionalists were quite explicit when suggesting what authority was to guarantee the existence of those objective forms, independent of taste. They kept referring to entities such as 'God', 'creator', 'infinite creative spirit', 'essence', 'purpose', 'nature', etc (40, 61). Functionalists proper, those of the 1920's and 1930's, did not refer to God but rather to demands of the 'Zeitgeist', 'Modern Epoch' or 'Machine Age'. Whether references were to God, Nature or History (references to the 'Zeitgeist', 'Epoch' or 'Age' are of course references to the authority of History) they referred to an other-than-human Intelligence, sanctioning the vision of objective design.



'La Recherche du Style Nouveau'. Révue des Arts Décoratifs, 1985: the slow progress towards a new style.

To recapitulate, we can say that the functionalist notion of function does not refer to the world of preferences, wishes and demands of human users, but rather to the alleged intents, purposes and plans of such non-human entities as Nature or History. I contend then that the functionalist claim that function exists prior to form is logically consistent only when the notion of function is understood as an 'objective purpose' or 'objective demand' generated by a Higher Intelligence. It is only in this capacity that the functionalist notion of function can be claimed to be independent of functional and aesthetic preferences of clients. The requirement that function ought to be the starting point of design now makes sense, because function becomes an objective rather than a subjective demand. In other words, it is only within the framework of the functionalist design metaphysics that the functionalist notion of function, and the dictum *form follows function* can be seen as coherent.

To illustrate: in the functionalist texts the notion of function manifests itself in the above sense, as an 'objective demand' with various degrees of obviousness. It was suggested by the Bauhaus director Walter Gropius in 1926: *"... the Bauhaus seeks - by the means of systematic theoretical and practical research into the formal, technical and economic fields - to derive the form of an object from its natural functions and limitations. (...) Research into the nature of objects leads one to conclude that forms emerge from a resolute consideration of all the modern methods of production and construction and of modern materials". (62)* Gropius seemed to be emphasizing that not all demands were to be evaluated equally - only those which the architect deemed 'natural' or 'objective', those which existed purportedly apart from the subjective preferences of users.

At other times the metaphysical pedigree of the notion of function is more evident. When the American industrial designer Walter Dorwin Teague wrote in 1940 about *function* in his ideological ouvre *Design This Day*, it sounds at first as if the notion referred to the user and his wishes: Teague's 'function' seems to be identical with 'user's demand'. But soon the 'function' is defined as something similar to an object's destiny: *"The function of a thing"*, he writes, *"is its reason for existence, its justification and its end, by which all its possible variations may be tested and accepted or rejected. It is a sort of life-urge thrusting through a thing and determining its development. It is only by realizing its destiny, and revealing that destiny with candor and exactness, that a thing acquires significance and validity of*

form. This means much more than utility, or even efficiency: it means a kind of perfected order we find in natural organisms, bound together in such rhythms that no part can be changed without wounding the whole". (32) (Cf. also (54)) By referring to a metaphysical rather than a common sense world, the notion of function is by necessity obscure. Teague himself complained about the elusiveness of the notion, writing of *"the difficulty of accurately defining a function, and definition's habit of retreating before our very approach".* Maybe this very elusiveness was perceived by functionalists as a tell-tale sign of a close contact with fundamental metaphysical magnitudes, and as such something positive (63). The functionalist references to functional and aesthetic perfection (50), when perfection is taken to be a feasible aim of the design effort should perhaps be understood as a reference to a Higher Intelligence, or Higher Order; cf. (39, 64-69).

Left blank for a work expressing modern feeling

Le Corbusier .
The city ot tomorrow, 1947 (1929).

THE NEW VISION - AND ITS ROLE

Despite the ambiguity of the functionalist notion of function, clear outlines of the enticing vision of an objective aesthetics emerge. We can imagine the fascination the vision must have exercised on the young designer in its promise to introduce an epoch of seamless unity of both functional and aesthetic worlds. True functional solutions were identical with true formal solutions: each and every function was to have one - and only one - solution proper to it, and, consequently, only one proper form. In other words, what functionalists called 'functional forms' were forms that were at the same time both functionally and aesthetically perfect. It was therefore considered morally reprehensible to arrive at forms other than those that were intrinsic or inherent, to 'functions'. Allegedly, the modernist designer was now employing neither old forms (as historicists did) nor devising new forms (as the pseudo-modern, 'modernistic' designers did (51, 70)) but uncovering and revealing the ones inherent in the problems at hand. As Tatlin put it: *"Neither the old, nor the new, but the necessary".* (71) To do otherwise would lead at best to a kind of masquerade (72-74), at worst it would be plain dishonesty (75). Such functional forms (the functionalist designer would have argued) were the opposite of formalist historicist and eclecticist architecture, since it was designed without regard for the fact that formal solutions were congenial to functional problems. Furthermore, since such functional forms cannot, by definition, emerge as consequences of pleasing the aesthetic preferences of users, it cannot happen that some will like them, others be indifferent to them, and yet others positively dislike them. One could safely assume that since such forms are not developed in order to appeal to anybody in particular, they will please everyone in general, regardless of social or cultural background. Functional forms simply do not appeal to taste, because they are a matter of truth, and truth cannot pander to taste (from the standpoint of the new architecture the question of taste may be therefore considered out of date; cf (64)). Functional forms (the functionalist designer would have maintained) were therefore creating a common visual language across a variety of boundaries, including the time-boundary: since such forms were not related to any fashion they could not go out of fashion either. They would not age, because they were timeless (30, 76). The functional language of forms was making it finally possible to bring to an end the wasteful use of resources, implied in the fashion-based changes of forms, as well as the aesthetic masquerade of false facades, driven by the chase for social prestige. Functionalism was simply showing the way back to natural, necessary forms appropriate for the Modern Epoch.

This vision of objective forms was enticing to the designer who espoused it, for personal as well professional reasons. The vision offered

him a new, exciting and flattering role: making him a vehicle of the Zeitgeist it abolished his previous status of an expert servant ministering to the mostly pedestrian demands of users. The exercise of the profession was now infused with a new sense of purpose, creating a strong sense of solidarity. The functionalist architects and designers would now perceive themselves as instruments through which the true formal language of the Modern Epoch would be brought forth. They conceived of themselves as a vanguard, bringing about a new world which had started to grow from within the confines of the old one. Functionalists would easily recognize themselves in what the German philosopher G. W. F. Hegel described as 'world-historical men' (Hegel's philosophy was in instrumental in preparing the ground for, among other things, the functionalist design metaphysics; cf. (77-82). In his Lectures *on the Philosophy of History Hegel wrote that world historical men: "... were thinking men, who had an insight into the requirements of the time – what was ripe for development. This was the very truth for their age, for their world; the species next in order, so to speak, and which was already formed in the womb of time. It was theirs to know the nascent principle; the necessary, directly sequent step in progress, which their world was to take; to make this their aim, and to expand their energy in promoting it. World-historical men – the Heroes of an epoch – must, therefore, be recognized as its clear-sighted ones; their deed, their words, are the best of that time. (...) They are* great *men because they willed and accomplished something great; not a mere fancy, a mere intention, but that which met the case and fell in with the needs of the age". (83)*

Although their vision had political implications, functionalists thirsted more for artistic freedom then for political power. The utopian vision of unity of functional and aesthetic solutions promised them exactly that kind of liberty. In suggesting that the aesthetic demands of the market were illegitimate, or by definition questionable, functionalist architects and designers proclaimed in effect their artistic autonomy and joined, at least mentally, the coveted ranks of fine artists (as Brolin convincingly argued in *Flight of Fancy* (16)). Modernist architects and designers were re-enacting the liberation process through which painters and sculptors arrived at the status of 'fine' artists. Painters and sculptors came to consider themselves to be definitely liberated from the demands of conventional taste after the Romantic philosophy of art in the decades before and after 1800, defined art as an original product of genius, a product not only independent of the preferences of the public, but usually in opposition to it (22, 23, 84). In this way it came about that art which previously was important for the sake of the buyer, the user or the client, started now to be considered more and more important for its own sake. In a similar fashion, and after the model of fine artists, architects and designers began to consider themselves to be liberated from the traditional duty to please the aesthetic, symbolic, institutional and other demands of clients.

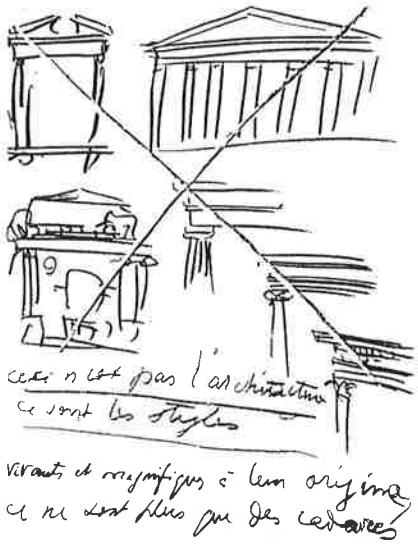
There is hardly any doubt that functionalists had vested interests in a design philosophy which cast them as a modern aristocracy in the new scheme of things. Until recently (16, 20, 85) literature on modernism was partisan and seldom pointed this out; the subject of interest vested in revolutionary visions is nowhere as unpopular as among the revolutionaries themselves. Still, unless we approach the design philosophy of functionalists as an expression of their aspirations qua designers and architects, I am afraid we will be reduced to devising variations on their 'determinist' self-interpretation. Interpretations that explain the functionalist architecture deterministically, i.e. as a result of outer formative forces (new functions, new materials, new technology, new age) or external ideas (scientism, logical positivism, technological utopism, totalitarian ideas of the 1920s and 1930s, etc.) - tend to become a replay of the functionalist claim that their architecture was an expression of historical necessity. I want to suggest that the master-key to functionalism, relevant to historians of design and design educators alike, is not to be sought in the determining factors but rather in the intentions, aspirations and dreams of those who espoused the design philosophy that explicitly denied any role to intentions, aspirations and dreams in design. Not that the approaches exploring the role of outer circumstances do not bring new insights - they always do. But such explorations will truly contribute to our understanding of modernism only when we will have first understood that both the 'determinist' philosophy and the 'determinist' self-understanding of functionalists was a part of their effort to jettison the user.

THE USER'S NEW IDENTITY

As the modernist designer's claims to authority increased, the user's status became more and more precarious. The direct references to users, or clients, when they appear in the functionalist texts, are almost invariably of an edifying bent, suggesting that the modernist architect is in possession of insight into what is best for them, both in the functional and in the aesthetic sense. In fact, to be defined as a user worthy of the functionalist architect's attention one had first to qualify as Modern Man, i.e. a person whose likes and dislikes were identical to those of the modernist architect himself. The functionalist references to users never

suggested a readiness to consider the users' wishes, demands and needs on their own merits (86). The client who was until the arrival of modernism considered to have a legitimate say in both functional and aesthetic matters, was from now on (in theory) proclaimed practically redundant. This was logical: since forms were claimed to be intrinsic to functional solutions, there was no reason to take the form-related preferences of clients and users seriously. On the contrary, there were good reasons to reject such preferences as irrelevant. If the user happened not to like the 'functional forms', it was considered to be the user's problem - not the designer's. Seen from the perspective of the functionalist design metaphysics, this was after all a rational attitude to take.

In the functionalist architect's eyes, the forms he 'brought forth' had no addressee: they were not aimed at any particular individuals, or any particular public - just as forms of leaves of grass, or of a snail's house (a functionalist would argue) were not meant for any public. The visual articulation of buildings and products was in principle never meant to appeal, in any sense of the word, to those who were to use them, or to see them: functionalists conceived of their buildings and objects as natural expressions of 'functions', as a function of 'functions', so to speak. Forms were not thought of as part of visual communication since communication, entails use of conventional, known, and ultimately 'historical', forms (87, 88). This probably explains why functionalists did completely without the notion of *aesthetic function:* they did not consider the visual side of buildings and objects as something to be used: 'How can forms growing organically from within take notice of the user's likes and dislikes?' Not surprisingly, the public, more often than not, found the new consciously 'unappealing' architecture and design to be - unappealing.



from: **Le Corbusier**
Précisions sur un état présent de l'architecture et de l'urbanisme (1929).

ANTI-FORMALIST - OR FORMALIST?

The final problem we have to touch upon is the question of how to interpret the concrete physical results of the functionalist design metaphysics, i.e. the new forms of functionalist architecture and design. Our conclusion is clear: The functionalist movement was driven by distinctly formalist objectives; functionalism is therefore a kind of formalism. Functionalists, however, always claimed the exact opposite: even if they were not always united in their views of their new architecture, and often criticized each other's ideas and buildings (64), they still did agree that their architecture and design was on the whole beyond formalism. Their aesthetics, they claimed, was objective, because it was a historically necessary result of forms following functions. They did not really choose the forms of their architecture and design, they said, but only mediated them on behalf of the Machine Age, Zeitgeist, or the Modern Epoch. Now, the problem is: what are we to make of such claims?

I propose that this functionalist self-understanding be taken altogether seriously. In other words, I submit that there are two opposite but justifiable answers to the question of formalism, depending on where one stands in relation to the functionalist design metaphysics. The reason for the differing views seems to be that those who do not believe in the functionalist design philosophy tend to see the functionalist buildings and products independently of the philosophy behind it, while the believers perceive their building and products solely through their philosophy. So when functionalists kept emphasizing that they were not interested in forms for the sake of forms, this was true - but it was true exclusively with regard to their monistic belief that the world is governed by one principle only, and that function and form are consequently indissolubly bound together. The self-understanding of the functionalists was simply a description of what they did and what

they achieved according to their design metaphysics, i.e. according to what they were supposed to do and achieve. As all strong believers in dogmas, they were mentally bound to operate within the confines of their all-encompassing belief, perceiving the outcome of their beliefs in terms of these beliefs only.

On the other hand, when one fails to share, or no longer shares, the doctrines of functionalist design metaphysics, the perspective changes dramatically. One is left to one's own common sense judgment, and sees the modernist architecture and design from the outside, that is, no longer through the theory. In this 'un-enlightened' common sense perspective, functionalist architecture and design presents itself as a strikingly formalist, stylistic, exercise in which architects and designers devised for their buildings and objects a 'no-choice', utilitarian style of dress - a style pretending not to pretend. With the collapsing of consensus support for modernism since the 1960s, some former adherents of the modernist design metaphysics came to see their movement from the outside, which brought some strikingly 'new' observations (89, 90). The leading modernists, however, never ceased to see themselves as, so to speak, chief midwives in the Zeitgeist maternity ward.

The fact of rejection or acceptance of the functionalist design metaphysics seems to operate as a kind of mental switch: either the switch is on, and the things functionalists said about their own architecture and design appear to fit; or the switch is off, and nothing whatsoever seems to agree. There appears to be no intermediate position here. This switch analogy may be refined into an analogy with the currently popular 'interactive' posters, prints and postcards which show seemingly abstract patterns, or collage-like forms without any obvious meaning. One is invited to 'break into' the picture, that is, to look through the surface in a special way; when successful, one is able to discern, thanks to the previous computer manipulation of the image, completely new strikingly three-dimensional constructs, as persuasively plastic as the live object-landscapes around. But it is a vision that has to be conjured up by a conscious and strenuous effort, and it is easily lost again. In a similar fashion, one may catch a glimpse of functionalist architecture and design in its intended non-formalist state of being only when one consciously attempts to conjure up and recreate the mental world of design metaphysics for which it was created (cf. remarks by Mumford (3) and Fitch (53) on the 'Platonic' nature of Mies' architecture).

In the world of the functionalist design metaphysics there was, naturally, no room for notions such as influence or visual models from earlier history, etc.; such notions described the old world of 'deception' and 'untruth'. But in the normal common sense world in which, but not for which, functionalist architecture and design were created (and in which they were bound to operate) the extrinsic sources of the aesthetic imagery in functionalism are not difficult to find. Two such sources are well established: we know that functionalists took many visual clues from the North-American corn-silo and factory buildings (which they learnt through photographic reproductions) (91), and we know further that they took at least as many clues from the abstract aesthetic idioms of contemporary painting and sculpture (of which all of them had a first-hand knowledge). To a non-believer the existence of these two sources would be enough to suggest that the genesis of the modernist forms was at variance with the rule form follows function: in both cases ready-made forms, rather than 'formless' problems, were used as points of departure. But if we ask, as Banham asked (91), how it came about that *"a design school could look like a factory, or an apartment block in Paris could resemble an automobile plant in the Detroit suburbs"*, or why many villa-facades reminded one of huge abstract geometric paintings or reliefs, again, two very different answers can be given, depending on the position of the switch. If the switch is on, such schools, apartment blocks or villas would not be perceived as a sign of formalism, simply because modernists had proclaimed technical buildings and later also abstract art (92) to be a genuine, organic expression of the Modern Epoch. As a consequence, the aesthetic references to factory buildings or to abstract art, ubiquitous in functionalist architecture and design, would not be perceived as a sign that functionalist practice was at variance with functionalist theory but, on the contrary, as a proof that the theory worked just fine. It would be read as a sign that the Zeitgeist was expressing itself through the designer, just as it was supposed to (30, 92-95). - "After all, was not the dictum *form follows function* only a principle, adherence to which was to secure the design proper to its own time? So what is the problem?" - a modernist designer might add. The functionalist design philosophy, by standing on a metaphysical rather than empirical basis, could obviously accommodate any conflict with its basic principles and survive unscathed in the believer's mind. (This is, of course, an unbeliever's statement).

Le Corbusier:
A Contemporary City of 3 Million, City Centre, 1922.

From **'Le Corbusier'** Précisions sur un état présent de l'architecture et de l'urbanisme (1929).

IMPACT ON THE DESIGNER AND THE DESIGNER'S IMPACT

Before coming to the concluding summary, let me touch upon two effects of the functionalist upgrading of the designer's and architect's status to that of an instrument of Higher Intelligence. One is the problem of practical uncertainty, or rather confusion, about what the designer's new role in the design process really consisted in. The other has to do with two different consequences of functionalist artistic innovations.

The designer who accepted 'function' as the objective starting point of the design process was led to see his own work as an objective process, and to understand the solutions deemed successful as a result of necessity. Since functionalist design philosophy claimed that the essence of designing was the search for intrinsic solutions, it precluded the functionalist designer from seeing that the 'intrinsic solutions' he arrived at were based on his own choices and that he - not functions, materials, constructions, or the epoch - was fully responsible for those solutions. The more he trusted that the functional starting point guaranteed an objective aesthetics, the less he understood that his aesthetic solutions were in fact addressed to the aesthetic sensitivities and preferences of his peers plus a minority of others endowed with 'cultural capital' (96) who shared these sensitivities. Due to the functionalist dominance of design education since the 1950's, the would-be architects and designers were not trained to respect (usually they were trained *not* to respect) the tastes and aesthetic preferences of anybody else, except their own, and those of their own privileged group (20). Their aesthetic education was geared mainly to tastes and needs of clients with avantgarde tastes. Not surprisingly, most newly educated architects and designers ended up being able to design for kindred spirits only. Like their functionalist grandparents, who trusted that they arrived at an objective aesthetics, the new generations of architects also tended to refuse conscious thought of considerations of institutional status and social prestige in buildings and products; they believed also that their aesthetic solutions, purportedly intrinsic to the tasks at hand, had taken care of everything worth taking care of. Students were too seldom reminded that the raison d'être of architecture and design has always been to make buildings and products meaningful to their owners and users (97) and that the owners' and users' need for signs of social or institutional belonging has always been, and will no doubt always remain, the prime engine of any design culture (98).

Whether the functionalist artistic innovations turned out to have positive or negative impact in the end, seems to have depended largely on whether the functionalist objects and functionalist solutions came to be imposed on the users, or whether they were offered to them as a part of broader choice. As long as the works of the modernist architects and designers remained a part of a market economy, as was the case with objects of industrial design or family houses, the commercial culture seems to have effectively contained and defused modernist attempts at making the users embrace the modernists' own aesthetic and other values. Under such circumstances the innovative modernist designs contributed to, rather than replaced, the plurality of stylistic choices. The functionalist mental set proved really devastating only where modernist solutions were *imposed* on the users, i.e. where users were left with no choice because administrative decision-making, for various reasons, replaced the working of the market. Often the modernist artistic visions were inflicted on the audience of the socially weak sections of the population who were utter strangers to the the sophisticated abstract aesthetics the modernists themselves relished. The notorious formalism of Le Corbusier's urban visions, and their pervasive influence on various large-scale housing projects until the

1970's, is probably the prime example the ultimately inhuman, alienating consequences of an undiscriminating foray into the field of artistic autonomy.

CONCLUSION

The functionalist notion of function was instrumental in creating an impression, more rampant among architects and designers than among the public, that functionalism represented and safeguarded the user's interests in the course of the design process. Our closer look at the notion of function, and the dictum *form follows function*, showed why this impression proved to be mistaken. The functionalist notion of function did not refer to the world of users but to functionalist design metaphysics, where the business of forms was to express 'functions' conceived by a Higher Intelligence. In the reality of our day-to-day world, however, where architects and designers are bound to live and act, no matter how lofty are the design philosophies they profess, the functionalist notion of function operated as a carte blanche: having been empty the notion made the architects and designers free to define it in ways that always legitimized their own aesthetic priorities.

To answer our introductory question, we can say that in our common sense world the dictum *form follows function* proved infeasible as a design precept. Not only did it fail to bring the promised end to formalism; on the contrary, it inaugurated, and legitimized, an era of a formalist approach to architecture and design. The dictum was the epitome of a design philosophy which, to put it paradoxically, brought about a practical victory of the idea of art for art's sake in this century's architecture and design, in the heat of a theoretical war against formalism. Unless we see the crux of the dictum in its enticing promise of artistic autonomy, the victory of the functionalist philosophy of design would be difficult to understand. ■

1. **Michl** J. "The crisis of modernist design pedagogy - and its (possibly) gratifying consequences for museums of applied art". Scandinavian Journal of Design History 1992;2:119-22.
2. **Banham** R. Theory and Design in the First Machine Age. London 1960.
3. **Mumford** L. "The Case Against 'Modern Architecture'." In: The Highway and the City. New York 1964: 162-175.
4. **Collins** P. Changing Ideals in Modern Architecture 1750-1950. London 1967.
5. **Norberg-Schulz** C. Intentions in Architecture. Cambridge, Mass. 1966.
6. **Jencks** C. Modern Movements in Architecture. Harmondsworth 1980.
7. **Brolin** B.C. The Failure of Modern Architecture. London 1976.
8. **Blake** P. Form Follows Fiasco: Why Modern Architecture Hasn't Worked. Boston/Toronto 1977.
9. **Watkin** D. Morality and Architecture: The Development of a Theme in Architectural History and Theory from the Gothic Revival to the Modern Movement. Oxford 1977.
10. **Asplund** H. Farvätt till funktionalismen! Stockholm 1980.
11. **Herdeg** K. The Decorated Diagram: Harvard Architecture and the Failure of the Bauhaus Legacy. Cambridge, Mass. 1983.
12. **Wolfe** T. From Bauhaus to Our House. New York 1981.
13. **Petroski** H. The Evolution of Useful Things. New York 1992.
14. **Petroski** H. Design Paradigms: Case Histories of Error and Judgment in Engineering. Cambridge 1994.
15. **Lambert** S. Form Follows Function? Design in the 20th Century. London 1993.
16. **Brolin** B.C. Flight of Fancy: The Banishment and Return of Ornament. London 1985.
17. **Pye** D. The Nature of Design. London, New York 1964.
18. **Pye** D. The Nature and Art of Workmanship. Cambridge 1968.
19. **Pye** D. The Nature and Aesthetics of Design. London 1978.
20. **Lloyd Jones** P. Taste Today: The Role of Appreciation in Consumerism and Design. Oxford 1991.
21. **Gombrich** E.H. "The Logic of Vanity Fair: Alternatives to Historicism in the Study of Fashions, Style and Taste." In: Ideals and Idols: Essays on values in history and in art. Oxford 1979.
22. **Abrams** M.H. "Kant and the Theology of Art". Notre Dame English Journal 1981;13:75-106.
23. **Abrams** M.H. "Art-as-such: The Sociology of Modern Aesthetics." In: Fischer M., ed. Doing Things with Texts: Essays in Criticism and Critical Theory. New York and London 1989: 135-158.
24. **Barzun** J. The Use and Abuse of Art. Washington D.C. 1974.
25. **Sullivan** L. "The Tall Office Building Artistically Considered." In: Athey I., ed. Kindergarten Chats (revised 1918) and Other Writings. New York 1947: 202-13.
26. **Adler** D. "Function and Environment." In: Mumford L., ed. Roots of Contemporary American Architecture: A Series of Thirty-Seven Essays dating from the Mid-Nineteenth Century to the Present. New York 1972: 243-50.
27. **Sullivan** L. The Autobiography of an Idea. New York 1956.
28. **Morrison** H. Louis Sullivan: Prophet of Modern Architecture. Westport, Conn. 1971.
29. **Cheney** S., M. Cheney. Art and the Machine: An Account of Industrial Design in 20th-Century America. New York 1936.
30. **Behrendt** W.C. Modern Building: Its Nature, Problems, and Forms. London 1938 (?).
31. **Behrendt** W.C. Modern Building: Its Nature, Problems, and Forms. New York 1937.
32. **Teague** W.D. Design This Day: The Technique of Order in the Machine Age. (Revised ed.) New York 1949.
33. **Rykwert** J. "Lodoli on Function and Representation". Architectural Review 1976;(July):21-6.
34. **Kruft** H.-W. A History of Architectural Theory from Vitruvius to the Present. London and New York 1994.
35. **Fisch** M.H. "Introduction." In: The Autobiography of Giambattista Vico. Ithaca and London 1975: 1-107.
36. **Alsop** J. The Rare Art Traditions: The History of Art Collecting and Its Linked Phenomena Wherever These Have Appeared. London 1982.
37. **Kaufmann** E. "At an Eighteenth Century Crossroad: Algarotti vs. Lodoli". Journal of the Society of Architectural Historians 1944;IV(April):23-29 (?).
38. **Kaufmann** Jr. E. "Lodoli Architetto." In: Searling H., ed. In Search of Modern Architecture: A Tribute to Henry-Russell Hitchcock. Cambridge, Mass., London 1982: 31-7.
39. **De Zurko** E.R. Origins of Functionalist Theory. New York 1957.
40. **Greenough** H. Form and Function: Remarks on Art, Design, and Architecture by Horatio Greenough. Berkeley and Los Angeles 1962.
41. **Steadman** P. The Evolution of Designs: Biological Analogy in Architecture and the Applied Arts. London 1979.
42. **Schaffer** R.B. "Emerson and His Circle: Advocates of Functionalism". Journal of the Society of Architectural Historians 1947.
43. **Wright** N. "Ralph Waldo Emerson and Horatio Greenough". Harvard Library Bulletin 1958; XII(1 Winter): 91-116.
44. **Honzik** K. Tvorba zivotniho slohu: Stati o architekture a uzitkove tvorbe vubec. Praha 1947.
45. **Menocal** N.G. Architecture as Nature: The Transcendentalist Idea of Louis Sullivan. Madison, Wisconsin 1981.
46. **Jordy** W.H. "Functionalism as Fact and Symbol: Louis Sullivan's Commercial Buildings, Tombs, and Banks". In: American Buildings and Their Architects, vol. 4 New York, Oxford 1972: 83-179.
47. **Andrew** D.S. Louis Sullivan and the Polemics of Modern Architecture: The Present against the Past. Urbana and Chicago 1985.
48. **Hardin** G. Nature and Man's Fate. New York 1961.
49. **Kuhn** T.S. The Structure of Scientific Revolutions. (Second, enlarged ed.) Chicago 1970.
50. **Michl** J. "On the Rumor of Functional Perfection". Pro Forma [Norway] 1991;2:67-81.
51. **Barr** A.H., P. Johnson. Machine Art: March 6 to April 30, 1934. New York 1934.
52. **Hitchcock** H.-R. "The International Style Twenty Years After". Architectural Record 1951; 110 (2): 89-97.
53. **Fitch** J.M. "Mies van der Rohe and the Platonic Verities". In: Four Great Makers of Modern Architecture. New York 1963: 154-163.
54. **Meikle** J.L. Twentieth Century Limited: Industrial Design in America, 1925-1939. Philadelphia 1979.
55. **Jormakka** K. "An Interpretation of the Functionalist Theory of Architecture". Datutop [Finland] 1985; 9:5-37.
56. **Neumeyer** F. The Artless Word: Mies van der Rohe on the Building Art. Cambridge, Mass. London, England 1991.
57. **Janson** H.W. Form Follows Function - or Does It? Modernist Design Theory and the History of Art. Maarsen 1982.
58. **Ligo** L.L. The Concept of Function in Twentieth-Century Architectural Criticism. Ann Arbor, Michigan 1984.
59. **Anderson** S. "The Fiction of Function". Assamblage 1987; (2): 18-31.
60. **Benton** T. "The Myth of Function". In: Greenhalgh P., ed. Modernism in Design. London 1990: 41-52.
61. **Sullivan** L.H. "Kindergarten Chats". In: Athey I., ed. Kindergarten Chats (revised 1918) and other writings. New York 1965: 15-174.
62. **Whitford** F. Bauhaus. London 1984.
63. **Gombrich** E.H.J. "Idea in the Theory of Art: Philosophy or Rhetoric?" In: Fattori M., M.L. Bianchi, ed. Idea, VI, Colloquio Internazionale. Rome 1991: 411-20.
64. **Taut** B. Modern Architecture. London/New York 1929.
65. **Read** H. "To Hell with Culture". In: To Hell with Culture and Other Essays on Art and Society. New York 1964.
66. **Teige** K. "K teorii konstruktivismu (1928)". In: Vybor z dila I: Svet stavby a basne. Praha 1966: 360-70.
67. **Bill** M. "Schönheit aus Funktion und als Funktion". Werk 1949; (8): 272-274.
68. **Teige** K. "Konstruktivismus a likvidace "umeni" (1925)." In: Vybor z dila I: Svet stavby a basne. Praha 1966: 129-43.
69. **Honzik** K. "A Note on Biotechnics". Concrete Way 1936;9(1):7-12.
70. **Wright** F.L. "The Passing of the Cornice". In: Modern Architecture: Being the Kahn Lectures for 1930. Princeton 1931: 47-62.
71. **Andel** J.et al. Art into Life: Russian Constructivism 1914-1932. New York 1990.
72. **Berlage** H.P. "The New American Architecture (1912)". In: Gifford D., ed. The Literature of Architecture: The Evolution of Architectural Theory and Practice in Nineteenth-Century America. New York 1966: 607-16.
73. **Prestiano** R. The Inland Architect: Chicago's Major Architectural Journal, 1883-1908. Ann Arbor, Michigan 1985.
74. **Gropius** W. "The Development of Modern Industrial Architecture". In: Benton T.a.C., D. Sharp, ed. Form and Function: A source book for the History of Architecture and Design 1890-1939. London 1975: 53-5.
75. **Sullivan** L.H. "XII. Function and Form (1)". In: Athey I., ed. Kindergarten Chats (revised 1918) and other writings. New York 1965: 42-48.
76. **Munari** B. Design as Art. Harmondsworth 1971.
77. **Gombrich** E.H. "Art and Scholarship". In: Meditations on a Hobby Horse and Other Essays on the Theory of Art. London and New York 1978: 106-119.
78. **Gombrich** E.H. "In Search of Cultural History". In: Ideals and Idols: Essays on Values in History and in Art. Oxford 1979.
79. **Colquhoun** A. "E. H. Gombrich and the Hegelian Tradition". In: Essays in Architectural Criticism: Modern Architecture and Historical Change. Cambridge, Mass. 1981.
80. **Gombrich** E.H. "'The Father of Art History'". In: Tributes: Interpreters of Our Cultural Tradition. Oxford 1984: 50-69.
81. **Watkin** D. "Modernism and Morality". In: Salokorpi A., ed. Aalto Symposium. Helsinki 1985: 138-15.
82. **Gombrich** E.H. The Styles of Art and Styles of Life. The Reynolds Lecture. London 1991.
83. **Hegel** G.W.F. Lectures on the Philosophy of History. London 1881.
84. **Abrams** M.H. "From Addison to Kant: Modern Aesthetics and the Exemplary Art". In: Fischer M., ed. Doing Things with Texts: Essays in Criticism and Critical Theory. New York and London 1989: 159-187.
85. **Bell** Q. "Appendix A: Fashion and the Fine Arts". In: On Human Finery. Second, revised and enlarged ed. New York 1976: 188-99.
86. **Taut** B. "Funktion". In: Heinisch T., G. Peschken, ed. Architekturlehre: Grundlagen, Theorie und Kritik. Beziehung zu den anderen Künsten und der Gesellschaft (Architekturlehre aus der Sicht eines sozialistischen Architekten). Hamburg/Westberlin 1977: 119-154.
87. **Gombrich** E.H. "Expression and Communication". In: Meditations on a Hobby Horse and Other Essays on the Theory of Art. London and New York 1978: 56-69.
88. **Ettlinger** L.D. Kandinsky's 'At Rest'. London 1961. Charlton Lectures on Art.
89. **Nelson** G. George Nelson [On] Design. New York 1979.
90. **Blake** P. No Place Like Utopia: Modern Architecture and the Company We Kept. New York 1993.
91. **Banham** R. A Concrete Atlantis: U.S. Industrial Building and European Modern Architecture 1900-1925. Cambridge, Mass. 1986.
92. **Hitchcock** H.-R. Painting Towards Architecture. New York 1948.
93. **Hitchcock** H.-R., P. Johnson. The International Style: Architecture since 1922. New York 1932.
94. **Read** H. Art and Industry: The Principles of Industrial Design. (5th ed.) London 1966.
95. **Bill** M. Form: A Balance Sheet of Mid-Twentieth-Century Trends in Design. Basel 1952.
96. **Bourdieu** P. Distinction: A Social Critique of the Judgement of Taste. London and New York 1984.
97. **Bonta** J.P. Architecture and Its Interpretation: A Study of Expressive Systems in Architecture. London 1979.
98. **Michl** J. "Industrial design and social equality". In: Parko S., ed. Den stora nordiska utställningen i Köpenhamn 1888. Helsingfors 1989: 67-70.

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