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SPACE, TIME AND ARCHITECTU

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PART VI SPACE–TIME IN ART, ARCHITECTURE AND CONSTRUCTION

Social, economic, and functional influences play a vital part in all human activities, from the sciences to the arts. But there are other factors which also have to be taken into account — our feelings and emotions. These factors are often dismissed as trivial, but actually their effect upon men's actions is immense. A good share of the misfortunes of the past century came out of its belief that industry and techniques had only a functional import, with no emotional content. The arts were exiled to an isolated realm of their own, completely insulated from everyday realities. As a result, life lost unity and balance; science and industry made steady advances, but in the now detached realm of feeling there was nothing but a vacillation from one extreme to the other.

The scope and strength of the emotions are both greater than we sometimes suppose. Emotion or feeling enters into all our affairs — speculation is never completely "pure," just as action is never entirely practical. And, of course, we are far from having free choice in this matter of feeling. Large tracts of our emotional life are determined by circumstances over which we have no control: by the fact that we happen to be men, of such or such a kind, living at this or that period. Thus 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 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.

Do We Need Artists?

Some people question whether any pervasive unity of feeling is possible in a period like ours. They regard science and industry as inimical to art and feeling: where the former prosper, the latter decline. Or they see science taking over the arts, opening up new means of self-expression which make us independent of them. There is some basis for views like these. Do we, then, really need artists any longer?

In any civilization, feeling continues to filter through every activity and situation. An environment whose chief aspects remain opaque to feeling is as unsatisfying as one which resists practical or intellectual control. But just this sort of emotional frustration has prevailed for a long time past. An official art has turned its back upon the contemporary world and given up the attempt to interpret it emotionally. The feelings which that world elicits have remained formless, have never met with those objects which are at once their symbols and their satisfaction.

Such symbols, however, are vital necessities. Feelings build up within us and form systems; they cannot be discharged through instantaneous animal outcries or grimaces. We need to discover harmonies between our own inner states and our surroundings. And no level of development can be maintained if it remains detached from our emotional life. The whole machinery runs down.

This is the reason why the most familiar and ordinary things have importance for the genuinely creative artists of our generation. Painters like Picasso, Juan Gris, the lyricist of cubism, and Le Corbusier have devoted themselves to the common objects of daily use: bowls, pipes, bottles, glasses, guitars. Natural materials have received the same attention: stones hollowed out by the sea, roots, bits of bark — even weather-bleached bones. Anonymous and unpretentious things like these scarcely figure at all in our normal consciousness, but they attain their true stature and significance under the artist's hand. They become revealed as *objets à réaction poétiques*, to borrow Le Corbusier's phrase. Or, to put it somewhat differently, new parts of the world are made accessible to feeling.

The opening up of such new realms of feeling has always been the artist's chief mission. A great deal of our world would lack

all emotional significance if it were not for his work. As recently as the eighteenth century, mountain scenery was felt to exhibit nothing except a formless and alarming confusion. Winckelmann, the discoverer of Greek art, could not bear to look out the windows of his carriage when he crossed the Alps into Italy, around 1760. He found the jumbled granite masses of the St. Gotthard so frightful that he pulled down the blinds and sat back to await the smooth outlines of the Italian countryside. A century later, Ruskin was seeking out the mountains of Chamonix as a refuge from an industrial world that made no kind of aesthetic sense. Ships, bridges, iron constructions — the new artistic potentialities of his period, in short — these were the things Ruskin pulled down the blinds on. Right now there are great areas of our experience which are still waiting to be claimed by feeling. Thus we are no longer limited to seeing objects from the distances normal for earth-bound animals. The bird's-eye view has opened up to us whole new aspects of the world. Such new modes of perception carry with them new feelings which the artist must formulate.

The artist, in fact, functions a great deal like an inventor or a scientific discoverer: all three seek new relations between man and his world. In the artist's case these relations are emotional instead of practical or cognitive. The creative artist does not want to copy his surroundings, on the one hand, or to make us see them through his eyes, on the other. He is a specialist who shows us in his work as if in a mirror something we have not realized for ourselves: the state of our own souls. He finds the outer symbols for the feelings which really possess us but which for us are only chaotic and — therefore — disquieting, obsessive stirrings. This is why we still need artists, however difficult it may be for them to hold their place in the modern world.

But if the artist is so necessary to us, how is it that he seems to have lost contact with all but a small number of his contemporaries? Ordinary people make it almost a point of pride to insist that, so far as they are concerned, his vocabulary of forms is totally incomprehensible.

This is often said to be a consequence of the revolt against naturalism. Actually, however, it dates from quite another event: the *proclamation de la liberté du travail* of March 17, 1791, which dissolved the guild system. The abolition of all legal restraints upon the choice of a trade was the starting point for the tremendous growth of modern industry and the isolation of the artist.

Cut off from the crafts, the artist was faced with the serious problem of competing with the factory system for his living. One solution was to set himself up in the luxury trades, to cater, quite unashamed, to the lowest common denominator of public taste. Art-to-public-order flooded the world, filled the *salons*, and won the gold medals of all the academies. With no serious aims and no standards of its own, the most such an art could hope for was a financial success, and this it often achieved. The most favored of these cultivated drudges — a Meissonier, for example — sometimes saw their canvases sold at a thousand francs the square inch.

As far as the public and the critics were concerned, this was art — and this the work the artist was meant to do. The half-dozen painters who carried on the artist's real work of invention and research were absolutely ignored. The constituent facts in the painting of our period were developed against the will of the public and almost in secret. And this from the beginning to the end of the century, from Ingres to Cézanne.

The same situation held for architecture. Here too the advances were made surreptitiously, in the department of construction. The architect and the painter were faced with the same long struggle against *trompe l'œil*. Both had to combat entrenched styles by returning to the pure means of expression. For some four decades painter after painter makes the effort to reconquer the plane surface. We have seen how the same struggle arose in architecture as a consequence of the demand for morality. 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.

The fact that modern painting bewilders the public is not strange: for a full century the public ignored all the developments which led up to it. It would be very surprising if the public had been able to read at sight an artistic language elaborated while its attention was elsewhere, absorbed by the pseudo art of the *salons*.

THE RESEARCH INTO SPACE: CUBISM

In many places, about 1910, a consciousness that the painter's means of expression had lost contact with modern life was beginning to emerge. But it was in Paris, with cubism, that these efforts first attained a visible result. The method of presenting spatial relationships which the cubists developed led up to the form-giving principles of the new space conception.[1]

The half-century previous to the rise of cubism had seen painting flourish almost nowhere outside of France. It was the high culture of painting that grew up in France during this period which formed the fostering soil for our contemporary art. Young people of talent — whether Spanish like Picasso, or Swiss like Le Corbusier — found their inspiration in Paris, in the union of their powers with the artistic tradition of that city. The vitality of French culture served to the advantage of the whole world. Among the general public, however, there was no sympathetic response to this achievement. It was from a form of art which the public despised that nineteenth-century painting drew its positive strength. Cubism, growing up in this soil, absorbed all its vigor.

[1] We shall treat contemporary movements in art here only so far as their methods are directly related to the space conceptions of our period, and in order to understand the common background of art, architecture, and construction. For an understanding of these movements the elaborate catalogues of the Museum of Modern Art, New York, are very useful. See Alfred H. Barr, Jr., *Cubism and Abstract Art* (New York, 1936), and Robert Rosenblaum, *Cubism and Twentieth Century Art* (New York, 1960). For a short survey with emphasis on historical relations, see J. J. Sweeney, *Plastic Redirections of the Twentieth Century* (Chicago, 1935); for the relation of contemporary art to education, industrial design, and daily life, see L. Moholy-Nagy, *The New Vision* (New York, 1938). The close relation of contemporary sculpture to primitive art, on the one hand, and, on the other, to an enlargement of our outlook into nature is stressed in C. Giedion-Welcker, *Contemporary Sculpture* (New York, 1955).

Picasso has been called the inventor of cubism, but cubism is not the invention of any individual. It is rather the expression of a collective and almost unconscious attitude. A painter who participated in the movement says of its beginnings: "There was no invention. Still more, there could not be one. Soon it was twitching in everybody's fingers. There was a presentiment of what should come, and experiments were made. We avoided one another; a discovery was on the point of being made, and each of us distrusted his neighbors. We were standing at the end of a decadent epoch."

From the Renaissance to the first decade of the present century perspective had been one of the most important constituent facts in painting. It had remained a constant element through all changes of style. The four-century-old habit of seeing the outer world in the Renaissance manner — that is, in terms of three dimensions — rooted itself so deeply in the human mind that no other form of perception could be imagined. This in spite of the fact that the art of different previous cultures had been two-dimensional. When earlier periods established perspective as a constituent fact they were always able to find new expressions for it. In the nineteenth century perspective was misused. This led to its dissolution.

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.

These considerations interest us only in so far as they affect the sense of space. Like the scientist, the artist has come to recognize that classic conceptions of space and volumes are limited and one-sided. In particular, it has become plain that the aesthetic qualities of space are not limited to its infinity for sight, as in the gardens of Versailles. 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.

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.

Space-Time

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.

The Artistic Means

"Abstract art" is as misleading a term for the different movements which depart from the spatial approach as "cubism" is for the beginnings of the contemporary image. It is not the "abstract," it is not the "cubical," which are significant in their content. What is decisive is the invention of a new approach, of a new spatial representation, and the means by which it is attained.

This new representation of space was accomplished step by step, much as laboratory research gradually arrives at its conclusions through long experimentation; and yet, as always with real art and great science, the results came up out of the subconscious suddenly.

The cubists dissect the object, try to lay hold of its inner composition. They seek to extend the scale of optical vision as contemporary science extends the law of matter. Therefore contemporary spatial approach has to get away from the single point of reference. During the first period (shortly before 1910) this dissection of objects was accomplished, as Alfred Barr expresses it, by breaking up "the surfaces of the natural forms into angular facets." Concentration was entirely upon research into a new representation of space — thus the extreme scarcity of colors in this early period. 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 (*fig.* **257**).

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.

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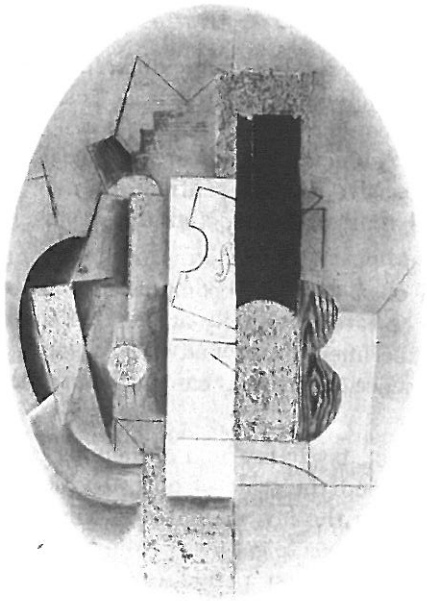
Hitherto planes in themselves, without naturalistic features, had lacked emotional content. Now they came to the fore as an artistic means, employed in various and very different ways, at times representing fragments of identifiable objects, at



257. PICASSO. "Still Life," c. 1914.

others such things as bottles or pipes flattened out so that interior and exterior could be seen simultaneously, at still others completely irrational forms equivalent only to psychic responses.

Around 1912 new elements entered; the planes were accentuated, assumed strength and dominance, and were given an additional appeal — to the tactile sense — by means of new materials (scraps of paper, sawdust, glass, sand, etc.). And when, though always meagerly, color was employed, it was often corrugated and roughened in order to strengthen the pigment. In such *collages* fragments of newspapers, fabrics, or handwriting, sometimes even single words, achieved the force of new symbols.

The process continued, from the grayish background of the first period through the *collage*, to the reappearance of color, which gradually became stronger and more varied, until its brilliant culmination in Picasso's and Braque's still-lifes toward and at the beginning of the twenties. In this period, perhaps cubism's happiest, color was used in pure strength. At the same time curvilinear forms were introduced, taken from such everyday objects as bowls and guitars, or simply invented. Color no longer had the exclusive function of naturalistic reproduction. Used in a spatial pattern, it was often divorced from any object, asserting a right to existence in itself.

Cubism originated among artists belonging to the oldest cultures of the western world, the French and the Spanish. More and more clearly it appears that this new conception of space was nourished by the elements of bygone periods. Its symbols were not rational, were not to be utilized directly in architecture and the applied arts, but they did give force and direction to artistic imagination in other fields. Following upon the first efforts of the cubists, there came, as has already been said, an awakening in various countries. In France appeared Le Corbusier and Ozenfant; in Russia, Malewitsch; in Hungary, Moholy-Nagy; in Holland, Mondrian and van Doesburg. Common to them was an attempt to rationalize cubism or, as they felt was necessary, to correct its aberrations. The procedure was sometimes very different in different groups, but all moved toward rationalization and into architecture.

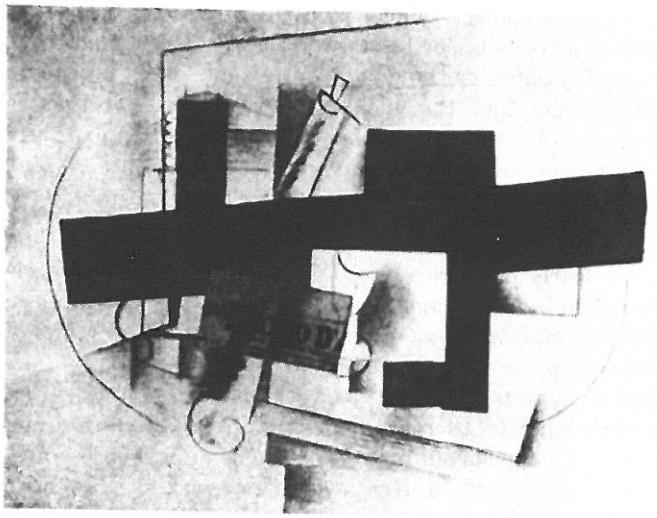
Purism

When Ozenfant and Jeanneret (Le Corbusier) came together as young painters in 1917, they called their painting *Purisme* (*fig.* **313**). In comparison with the movements preceding it (constructivism in Russia or neo-plasticism in Holland), purism, coming out of French soil, was the closest of all to the aim of cubism and, at the same time, to architecture.

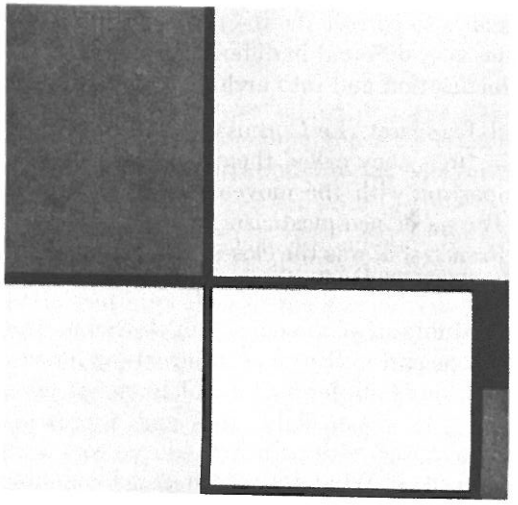
Constr

Two years after the exhibition of the cubists in the Salon des Indépendants, there appeared in Russia an abstract-art movement, fostered by Kasimir Malewitsch, which completely eliminated the object. It was a flight from and a protest against the naturalistic object, with painting reduced to a few signs of symbolic intensity. What its paintings achieve are fundamentally only pure interrelationships. Flatly extended rectangles and strips float in continuous interrelation in space for which there is no true human measure.

Interrelation, hovering, and penetration form the basis of Malewitsch's half-plastic architectural studies, which he calls

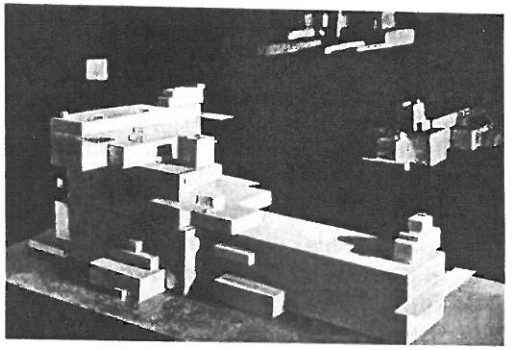


258. BRAQUE. Collage, 1913.

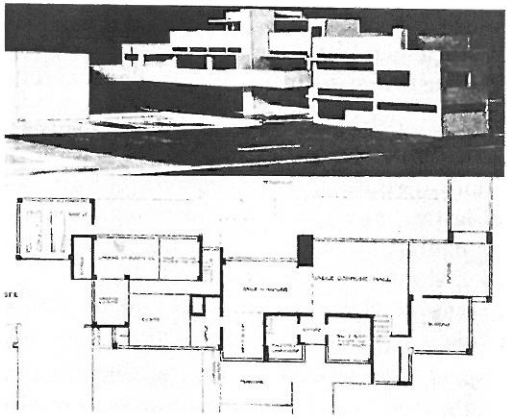


259. MONDRIAN. Composition.

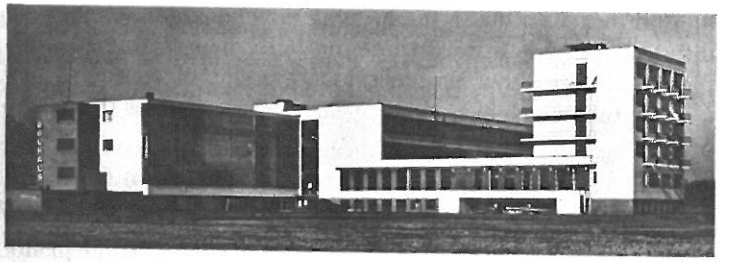
"architectonen." These objects are not intended for a particular purpose but are to be understood simply as spatial research. Interrelations are created between these prisms, slabs, and surfaces when they penetrate or dislodge each other (*fig.* **260**). They come close in spirit to the so-called megastructures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



260. MALEWITSCH. Architectonics, c. 1920.



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



262. WALTER GROPIUS. The Bauhaus, 1926.

leo-plasticism

Neo-plasticism, an expression used by the Dutch painter Mondrian, signifies that three-dimensional volume is reduced to the new element of plasticity, the plane. Mondrian sacrifices every contact with illusionistic reproduction, going back to the fundamental elements of pure color, of planes, their equipoise and interrelations.

The small circle of young artists who gathered around Theo van Doesburg and his periodical, *Stijl*, after 1917 progressed much more radically than the French painters and architects. Van Doesburg and Mondrian sought "pure art" not in any way deflected by external motives. With them everything rests on the distribution and juxtaposition of planes of pure color: blue, red, yellow. To these are added black and various tones of white, all being placed in a network of panels.

The Belgian Vantongerloo, who also belongs to this circle, demonstrated with the prisms, slabs, and hollows of his plastic of 1918 that contemporary sculpture, like painting, was not to be limited to a single point of view.

Van Doesburg, the moving spirit of the circle, was painter, man of letters, and architect. Although he executed few buildings, he cannot be omitted from the history of architecture, since, like Malewitsch, he possessed the gift of recognizing the new extension of the space sense and the ability to present and explain it as though by laboratory experiments.

One of van Doesburg's drawings in which an attempt is made to present "the elementary forms of architecture" (lines, surface, volume, space, time) may very well have appeared to many at that time as so much disjointed nonsense (*fig.* **81**). The present-day observer, who has the advantage of being able to look back upon intervening developments, has a very different attitude toward these mutually penetrating flat surfaces. He sees how the enormous amount of contemporary architecture which has since appeared acknowledges this vision of space.

In 1923 van Doesburg, together with van Eesteren (*fig.* **261**), who later became a town planner of Amsterdam, produced a house that is bolder than any other building executed during the period. The breaking-up of the compact mass of the house,

the accessibility of the roof, the horizontal rows of windows — in fact, all the features that were later to be realized in numerous examples were indicated in it. If a *collage* by Georges Braque (*fig.* **258**), produced ten years earlier, consisting of different papers, scraps of newspaper and fragments of planes, is placed alongside a reproduction of this house, no words are necessary to indicate the identity of artistic expression. An architectonic study of Malewitsch might be likened to it equally well. The effect is as if the blind surfaces of the Malewitsch sculpture had suddenly received sight. It is obvious that in the second decade of this century the same spirit emerged in different forms, in different spheres, and in totally different countries.

THE RESEARCH INTO MOVEMENT: FUTURISM

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."

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.

eginnings of turism

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.

For Jakob Burckhardt there reigned in Italy "the quiet of the tomb." The futurists were a reaction against this quietness; they felt ashamed that Italy had become simply a refuge for those seeking to escape from the demands and realities of the present. They called upon art to come forth from the twilit caves of the museums, to assert itself in the fullness of modern thought and feeling, to speak out in authentic terms of the moment. *Life* was their cry — explosive life, movement, action, heroism — in every phase of human life, in politics, in war, in art: the discovery of new beauties and a new sensibility through the forces of our period. Not without right did they claim to be "the first Italian youth in centuries." [1]

So, from the beginning, they plunged into the full struggle, and carried their cause militantly to the public. The poet Marinetti, whose apartment in Rome even to this day bears the escutcheon of the "Movimento futurista," proclaimed in the Parisian *Figaro* of February 20, 1909, "We affirm that the splendor of the world has been enriched by a new beauty: the beauty of speed." And later, in 1912, in the "Second Technical Manifesto of Futurist Painting," the futurists developed their principal discovery, that "objects in motion multiply and distort themselves, just as do vibrations, which indeed they are, in passing through space." The most exciting of their paintings realize this artistic principle.

[1] For the literary intentions of futurism cf. the article of its founder, F. T. Marinetti, in *Enciclopedia italiana*, vol. XVI, 1932.

The productions of futurist painting, sculpture, and architecture are based on the representation of movement and its correlates: interpenetration and simultaneity. 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."

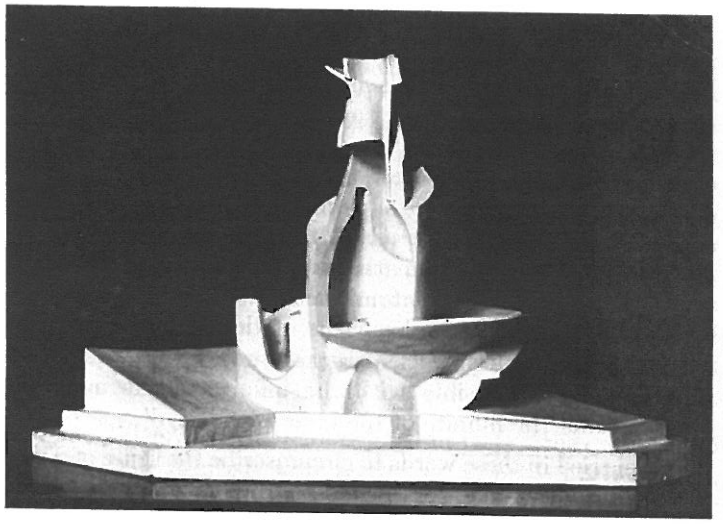
Futurism cubism – common and diffe

Boccioni tried in these words to circumscribe the sense of a new plasticity which conceives objects (as they are in reality) in a state of movement. This was reflected directly in his sculpture, "Bottle Evolving in Space," 1911–12, with its intersecting spatial planes. One of the few sculptural masterpieces of the epoch, this sculpture expresses the inherent significance of an object of daily use by treating it with new artistic invention. Sometimes, as in this instance, cubistic and futuristic works are closely bound together on a common basis of the same spatial conception.

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.

Usually the futurists present movement as such, as subject matter ("Elasticity," Boccioni, 1911; "Dynamisme musculaire, Simultanéité," Carrà, 1912; "Speed," Balla, 1913), or show objects and bodies in motion (Gino Severini's study of the dance as a movement in mass, "The Dance Pan-Pan," 1911; "Walking Dog," Balla, 1913; "Rattling Cab," Carrà, 1913).[2]

[2] For illustrations of this first and most important futuristic development cf. Boccioni, *Pittura, scultura futuriste* (Milan, 1914), a volume of over 400 pages, with bibliography of exhibitions, manifestoes, etc.



263. BOCCIONI. "Bottle Evolving in Space," 1911–12.

In both futurism and cubism this enlargement of the optical was achieved before 1914, before the first world war. The cubists were the more passive and less vocal. Not fighters in the futuristic sense, more purely research men in their work, they kept to their ateliers, preparing quietly and without fanfare the symbols of our artistic language. Braque and Picasso wrote no ponderous tomes expounding their theories. Even the name "cubist" was a label fixed upon them by outsiders. They did not try to paint "movement" itself, or the dynamism of muscles, or the automobile, but through their still lifes of things of daily use sought to find artistic means for our spatial conceptions. This is the reason cubism found extension into so many ramifications. This is why laboratory painters, who had no thought beyond their own artistic problems, could also give an impulse to the expression of the new spatial conceptions in architecture.

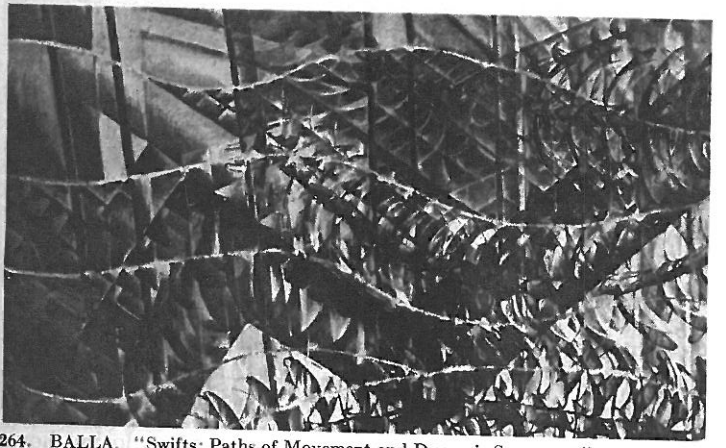
rchitecture

To try to introduce the principle of movement directly into architecture did not touch the fundamental problem. In his projects for his "Città Nuova," in his skyscraper apartment houses connected with subways, elevators, and traffic lanes at

different levels, Antonio Sant' Elia tried to introduce the futuristic love of movement as an artistic element in the contemporary city (*fig.* **192**). Sant' Elia's "Città Nuova," as well as Malewitsch's sculptural studies of the same period, expressed trends that were first implemented in the 1960's when movement in cities came to be recognized as a problem of urban form and obliged different levels to be created for pedestrians and vehicles. We do not know if Sant' Elia's talent would have developed. He died in 1916, at a time when his contemporary, Le Corbusier, was still far from self-realization. Although Sant' Elia's prophetic vision did not direct the way architecture then followed, it did present a new viewpoint in a period when everyone was looking for a signpost. In his manifesto of July 14, 1914, which he published in connection with the exhibition of his schemes in Milan, he demanded an architecture imbued with the utmost elasticity and lightness, utilizing all the newly developed elements of construction from iron and ferroconcrete to composite materials made by chemical processes, including textile fiber and paper. Behind these technical demands loomed his artistic aim: mobility and change. What he wanted to realize he condensed into the few words: "Every generation its own house!"

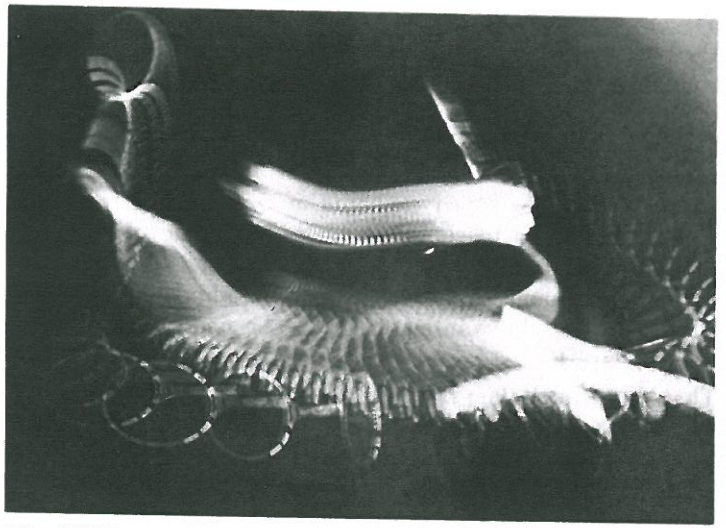
There are times when the man of the laboratory is compelled to go forth into the street to fight for his work. On occasion

Difficultie



264. BALLA. "Swifts: Paths of Movement and Dynamic Sequences," 1913.

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.



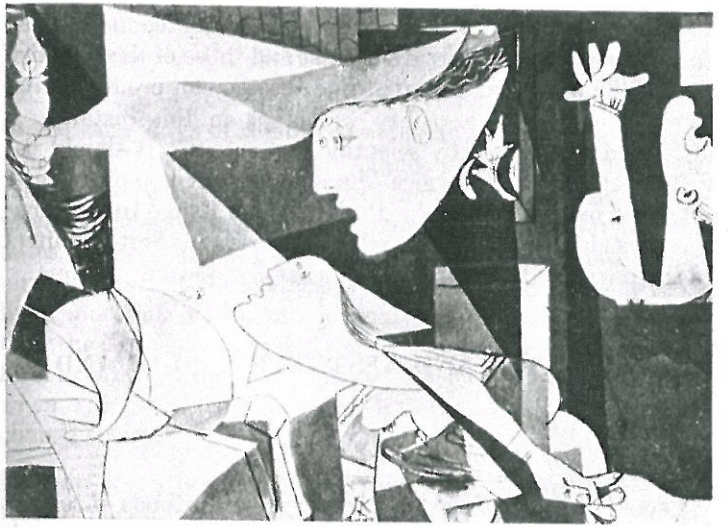
265. EDGERTON. Speed photograph of a tennis player, 1939.

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, however, 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."

"the radiant eye of day with the electric bulb of night for a pupil." The picture went through many variations and preliminary studies, but one detail remained almost unchanged — the rush of flight condensed into a symbol of two elongated human heads, hair streaming back, chin and neck in one sweeping line, faces enclosed in spherical triangles (*fig.* **266**). How charged with inner truth this 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 (*fig.* **265**) 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. It should not be forgotten that "Guernica" hung in the pavilion of the legal Spanish government at the Paris World's Fair. Its presence there was largely due to the efforts of José Luis Sert, architect of the pavilion, and a friend of Picasso.