Kenneth Kaiser, *Concepts of the architectural object*

It may be possible to add some useful comments on architecture relevant to Patricia Carpenter's "The musical object" without reviving the Romantic parallel "architecture is frozen music," and without using the treacherous parallels of the arts required by spiritualistic theories of cultural history. Though music and architecture may both employ measure, proportion, and sequence, and deal in the ordering of essentially abstract form, the way in which a building springs from a specific need and is put to a particular use in a particular spot makes the problem of architecture unique.

Architecture can never be adequately explained without taking that use into account (though many excellent writers have tried), for it is only in that specific use that the buildings have their strongest emotional effects, and through the use that their major symbolism arises.

There is not a single, dominant mode of expression or symbolism throughout the history of architecture, however, and each variation brings a change in the status of the architectural object. Further, it should perhaps be recognized at the outset that buildings, pieces of music, and other works of art are subject to disuse, abuse, misuse, or creative re-use, and that any one piece seems to have several possible aesthetic effects, and a multiple status as object. The aesthetic presumptions of modernist architects, usually applications in one guise or another of a *Zeitgeist* theory, have not adequately explained this multiplicity of effects. If the major achievement of the Cathedral of Amiens is that it expressed the spirit of its time, then we should be relatively indifferent to it as an aesthetic object. Because of this difficulty, architects otherwise in agreement have argued whether "History" is the great storehouse of material, the great teacher of principle, or the great irrelevance. Generally, however, architects have been interested in what the historic buildings meant to their original creators, and the architect's unspoken aim has been to capture or recapture that relationship with modern means (this holds even for the Gothic- or Greek-revival). The historian-critic, also, usually finds that the original meaning is the one worth studying.

In regard to Miss Carpenter's thesis it may be interesting to ask whether the years from about 1440 to 1925 form an era of the isolated piece of architecture, the self-conscious monument designed on paper, dependent for its aesthetic effects on that paper design by the calculating individual architect.

Immediately we must admit that the earlier date can be defended only by contrasting a few "Renaissance" buildings in Italy with an international Gothic tradition which continued in some isolated corners of Europe until it was replaced by an equally international Baroque tradition in the 18th century. The latter termination, 1925, moreover, can be fixed only on claims made in modernist architectural manifestos, claims yet unfulfilled.

What distinguishes a building by Brunelleschi or Alberti *as object* from its

medieval predecessor? A very practical matter first. It has been realized only fairly recently, by Frankl and others, that the medieval builder's basic problem was that he lacked a measuring stick![1] From town to town there was no commonly accepted "foot" or "yard" which would allow the free-mason to convert a dimensioned or scaled drawing on paper into a full-size construction.[2] These masons (called "free" because they were not attached to a single guild hall, but moved about as work demanded) evolved a geometric system that allowed them to lay out a building as elaborate as a cathedral from a mere verbal description or a diagrammatic sketch, with no more equipment than a compass, a square, and a cord that could be knotted to record lengths and doubled to divide that length, etc. A building was begun by arbitrarily fixing the length of a lath or module stick in multiples of which the major bays, spans, openings, or divisions of the building could then be laid out. It was hard for historians to uncover this process because it was a well-kept guild secret. Only in the later Middle Ages, as the guild system was breaking down, were a few clandestine handbooks published which have helped us interpret the geometric schemes shown in the much earlier sketch-book of Villard de Honnecourt (Fig. 1).

This ubiquitous geometric system controlled the proportions of Gothic buildings down to small detail (scholars have checked certain cases)[3], but it seems to have been pursued for pragmatic rather than for metaphysical purposes. In 1392 the building committee of the Milan Cathedral had to decide on a scheme for determining the heights of the various vaults. Torn between the desire for great height and the fear of collapse it might bring, the committee first rejected very high proportions *ad quadratum*, then considered a lower scheme *ad triangulum*, and finally compromised on an even lower scheme composed of an inelegant combination of equilateral and Pythagorean triangles (Fig. 2).[4]

Modern scholars, notably Panofsky and von Simson, have tried in very different ways to find the "iconology," the inherent psychological meaning, of the Gothic system, but their type of meaning seems yet relatively uncertain in comparison to the sort of "iconography" that the abbots and bishops themselves attributed to their buildings.[5] Parts of the church or its formal characteristics were paralleled via a language of "conventional signs" with the Holy Family or the City of God. The meaning was semiotic.

Victor Hugo's notion of the cathedral as the common book of life, communally written, consulted daily (which so caught Frank Lloyd Wright's fancy), may be correct in its general direction. Though we have learned the names of a few Gothic architects, Robert de Luzarches, Erwin von Steinbach, and others, whose works testify to great personal mastery, the buildings retain the aspect of "activity," not the aspect of "pieces" totally pre-designed. The irresolution of formal problems and the tolerance of disharmony in even the more perfect Gothic works is amazing.

Brunelleschi and Alberti, very much to the contrary, avoided the old geometric proportioning system and developed numerical proportions. Scale

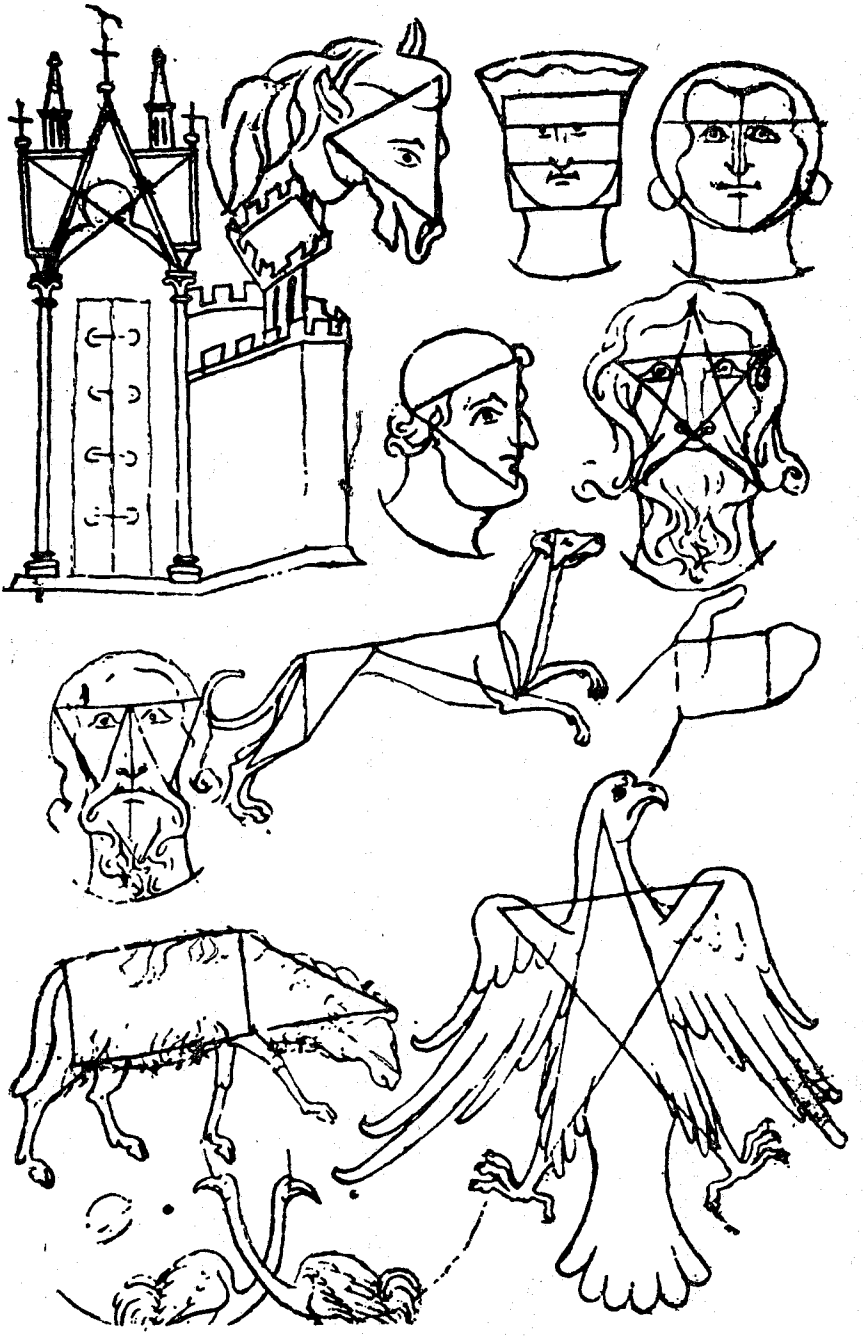

Fig. 1 Villard de Honnecourt, Sheet from Sketchbook circa 1235. Geometric schemes for the proportioning of figures.

drawings were introduced (with difficulty) into building practice, but more important, these Renaissance architects sought complicated proportional relationships in their plans, elevations, and details that could be developed only in paper or model designs. Their will to create discrete pieces of architecture, consistent throughout and self-sufficient, cannot help but impress those who visit the Pazzi Chapel in Florence or San Andrea in Mantua.

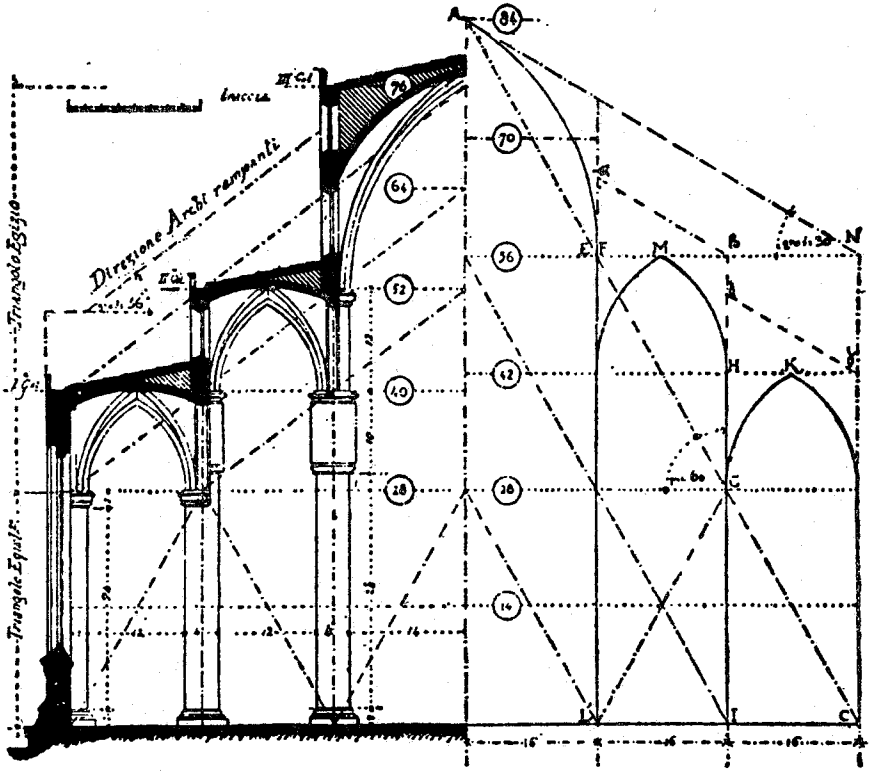

Fig. 2 Milan Cathedral, Cross Section of the Nave. Right half: diagram of proportions based on equilateral triangles proposed in 1391 by Gabriele Stornoloco. Left half: vaults as executed according to the scheme approved by the building committee in 1392, based partly on equilateral and partly on Pythagorean (3:4:5) triangles. (L. Beltrami after C. Boito, *Il Duomo di Milano*, Milan, 1889)

These "pieces," however, were meant to carry universal significance in a number of new ways.[6] First, the studied revival of Roman architectural forms (and Roman methods as understood from Vitruvius) for churches and palaces set these buildings apart in the city as illustrations of higher principle. Second, the use of small whole number ratios for proportions was intended not to imitate the musicians, but rather to echo the sacred harmonies of the universe as described in Plato's *Timaeus*. Since they observed these numerical proportions in the human body as well, their system has acquired the name "anthropometric proportion." Third, their neo-Platonic preference for the

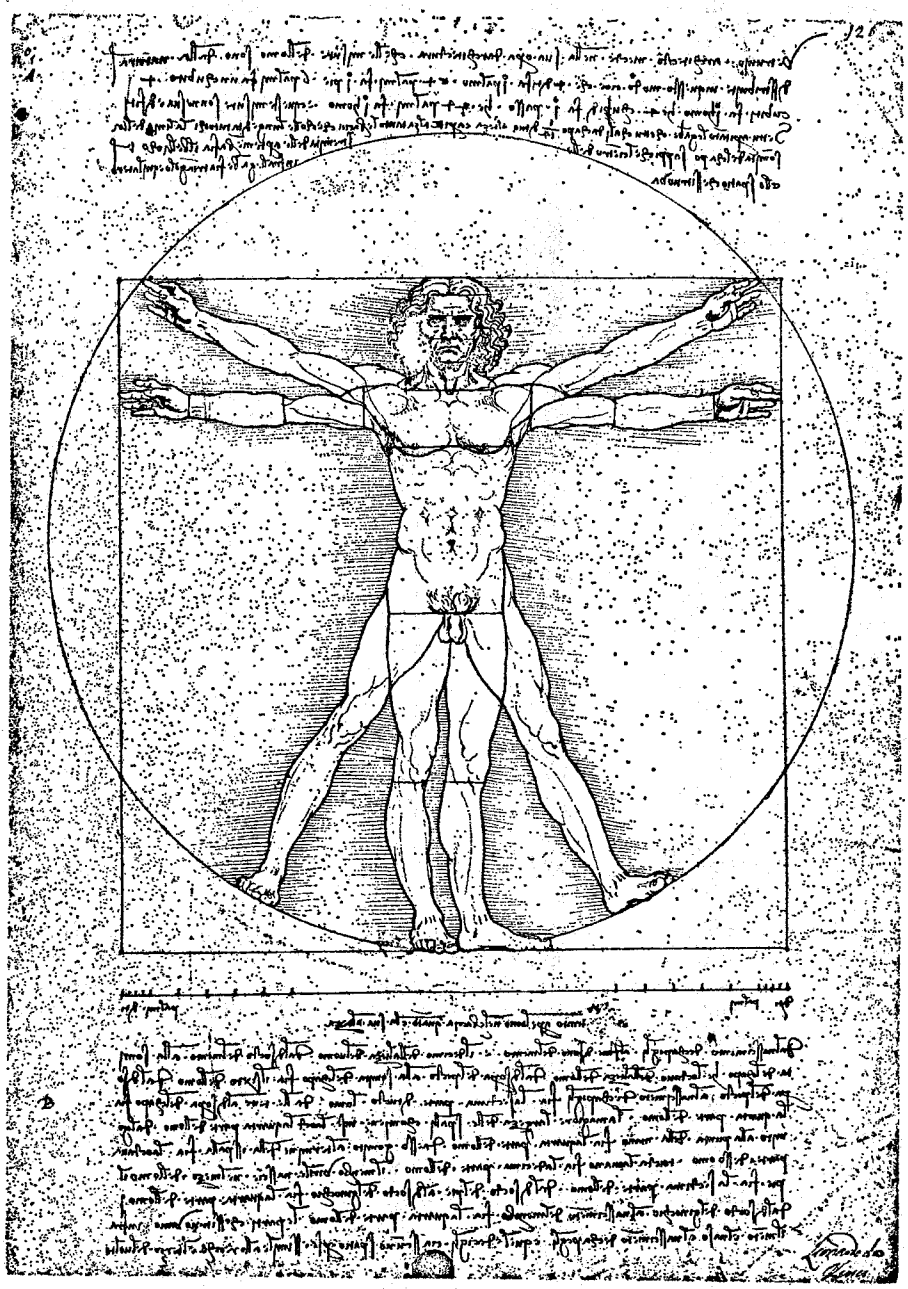

Fig. 3 Leonardo da Vinci, Drawing circa 1490. The divisions of the figure are rational measurements on the scale drawn below the square. (Accademia, Venice)

circle and the square for the plans of churches bore the same sacred iconology of perfection and divinity (Fig. 3).

Contrasting their work with Gothic building, we see a strong shift from semiotic to symbolic meaning, matching the change from ritualized building "activity" to the self-conscious "piece."

It seems fairly certain that the exploitation of numerical proportions in building depended heavily on the idea of central perspective, particularly for a theory of proportional diminution with distance. The likelihood that Brunelleschi invented both systems links them further. Renaissance buildings are definitely to be seen in perspective space—in picture space—as the painters represented them, but, at the same time, we should not feel we are missing some more "global" experience. Panofsky has argued that the appearance of central perspective in art (or its disappearance) speaks first of all for an anthropocentric mode of thought (or its demise).[7] Conceiving buildings or musical compositions as unified entities in visual space may be a habit eminently suited to the human mind, and an inherent characteristic of humanistic eras.

The variations in architectural expression through subsequent periods are less interesting for our purpose than the recent challenge to the very basis of "Renaissance" design staged primarily by Le Corbusier between 1923 and 1929. His remarkable book *Vers une architecture* of 1923 was an odd mixture of old French academic themes with an extremely original bid for modernity. His conception of what the significance of this architecture should be was so novel that it escaped the English translator, and most readers over the decades have followed suit, mistaking the book for a functionalist tract.

Le Corbusier's incessant references to modern machines—aircraft, ships, and automobiles—do not suggest that the essence of architecture is the efficient, rational design found in machines. He wanted, rather, to illustrate that architecture should have the objective quality which he found at that time only in machines. His eulogy of the Parthenon includes the claims that it belonged in the realm of the mechanical, that it was totally unsymbolic! His notion (and Hegel's) was that at the peak of classic art, the building was "the pure creation of the spirit," untrammeled by any reflective or conventional meanings.

In these years he worked to rid his buildings of the very language of the old symbolism—the Renaissance paper design with its calculated unities. Asymmetry, dynamism, and surprise were the rule; exteriors and interiors were of uncertain extent; perception depended not on a controlled viewpoint, but on proceeding around and through. His bid for the "object" quality of the machine was made with a proliferation of common objects in the buildings (Fig. 4).[8] Mass-produced factory windows, bare plumbing pipes, standard radiators, crude electrical fittings, common steel handrails, and Thonet furniture were all openly displayed for their commonness. These were Le Corbusier's equivalent of the *objet trouvé* of the Dadaists. The building was art only in the sense that it was the artist's collage of common non-art objects.

Le Corbusier's ideas were immediately put to use by Gropius and others

in Germany, where before the First World War there had been an attempt to rally a new architecture around the word *Sachlichkeit.* The results had been disappointing. In practice, *sachlich* might describe a perfectly ordinary house with some unexpected Doric columns at the entrance and unusual neo-Biedermeier interiors. It was at the entrance and in the interiors of an ordinary house that some Art Nouveau filigree would have indicated, a few years before, a different progressive ideological allegiance. Biedermeier was pursued for its simplicity and cleanness, not for the "commonness" implied in derogatory usages of the name.

Occasionally this prewar *Sachlichkeit* involved the direct imitation of machine forms in building, but a strong traditional hierarchy of *genres* in architectural thought made this practice strictly inappropriate for anything

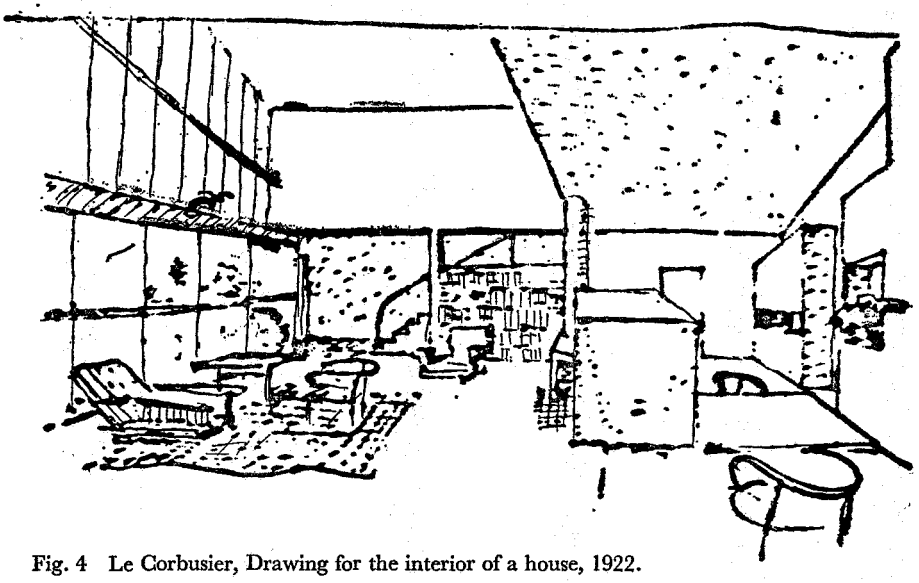

Fig. 4 Le Corbusier, Drawing for the interior of a house, 1922.

but factories or other rather utilitarian building. It is incorrect to speak of "modern architecture" at all in Germany (that is, building of all types, from factories to churches, made to express a unitary image of modernity through a canonical vocabulary of simple, rectangular, machine forms) until this hierarchy of *genres* broke down. It did not give way even in the work of Gropius and the Bauhaus until 1925, and then under the impact of Le Corbusier.

The dream of an architecture expressive of an utterly new world, experienced vitally and instinctively, not statically and reflectively, was very old, but means of realizing the dream were late in coming. For Gropius, the cultural salvation of mankind depended on adherence to the achievements of the new architecture, but other leading architects quickly became bored with the ideals of the great campaign, while the plodding followers carried its results over most of the globe.

The buildings themselves, "masterpieces of the Twenties," first touted for their universality and rationality, aged poorly. They are again fascinating today, but fascinating as the most highly calculated of fine-art, aesthetic objects! They no longer exude modernity, and their effects seem more delicate than dynamic—change a color from white to buff, or close the window shades, and the architectural effect is utterly changed.

In short, the radical compositional methods and the new millennial iconology did not rid architecture of an old and persistent ailment: aestheticism. Since the 1850's, when a few architects first departed from established classical or medieval vocabularies, original creations and novel devices had raised questions of credibility, taste, and tradition that could not be answered in the old ways. Designs seemed to call for painterly evaluations which even today have as yet no established place in architectural thought.

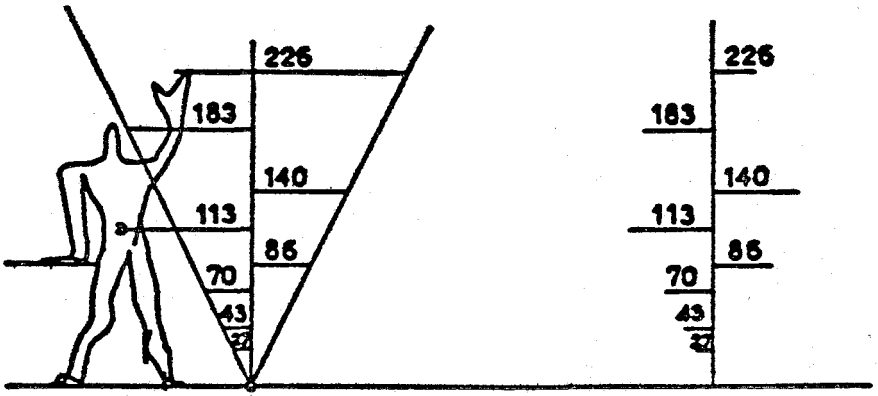

Fig. 5 Le Corbusier, *Le Modulor*, 1950. Two interlocking scales of dimensions are based on Fibonacci series expansions from the "golden ratio."

The particular choices made by architects in the Twenties made them especially vulnerable to aestheticism. Like contemporary artists in other fields, they believed themselves to be past "the end of a mimetic tradition." The only valid expression would be totally new. Their choices, machine objectivity, modernity, "the spirit of the times," were all vague concepts of higher generality than the particular use of the buildings. But in architecture, despite the collapse of other traditions, buildings always tend to be mimetic of use. The aestheticism of the Twenties, then, is precisely that the symbolism of the buildings often bore no relation to their use. The collision of the two is the anomaly of the period.

Le Corbusier's own later works and books may be the best criticism of the modernist program. From the Thirties on he returned to composition of mass and space in more distinct pieces. His buildings became more decisively mimetic of use. With their eccentrically personal sculptural effects, the buildings could no longer be viewed as "ordinary life" transformed into art.

His formal theory of proportion, *Le Modulor*, which appeared only in 1950,

is the first in the history of architecture to propose scales of fixed measurements suitable for the dimensions of the human body (Figs. 5–6). All previous systems had dealt in ideal ratios which the designer could apply at any absolute size. *Le Modulor* speaks implicitly for an empathetic response to the object in the observer. One can doubt that it is these modular scales of measurement that give his buildings (at Chandigarh, for example) an empathetic quality, but few would deny that these buildings have this quality to an extraordinary degree. In this the late buildings are utterly different from his earlier collages of common objects.

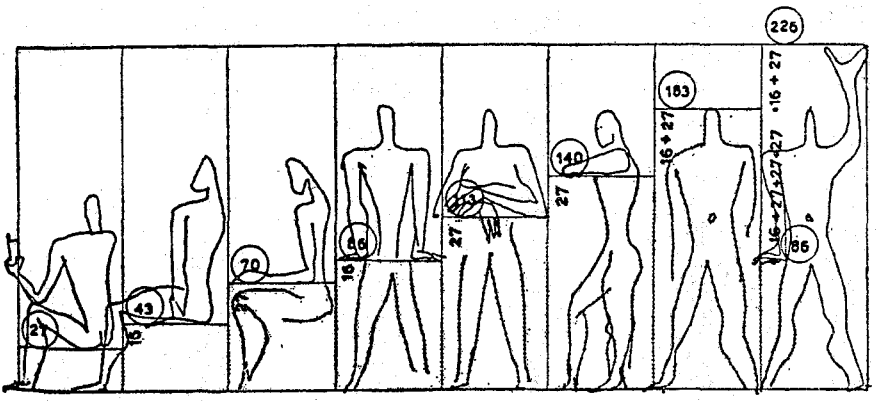

Fig. 6 Le Corbusier, *Le Modulor*. An illustration of the suitability of the scales of dimensions to human needs.

The best designers today feel that the attempts to liberate design from the limitations of the set academic "piece" (symbolized in Germany by the insistence on the word *Baukunst* in place of *Architektur*) resulted in a program with its own severe, inherent limitations. Therefore, they are again open to all the possibilities evolved in the past for the designing of objects, isolated or common.

NOTES

[1] Paul Frankl, "The secrets of the medieval masons, with an explanation of Stornaloco's formula by Erwin Panofsky," *Art Bulletin*, 27:46–60 (1945).

[2] In the Imperial Roman period standard measures were enforced and considerable use was obviously made of planning on paper. We know also that Charlemagne tried to standardize measures throughout his empire and that he was successful enough so that the "ideal" plan for the monastery of St. Gall, developed in 816 and 817, was recorded in a modular drawing on parchment based on a scale of one sixteenth of one Carolingian inch on the drawing equal to one Carolingian foot of the building. See Walter Horn and Ernst Born, "The 'dimensional inconsistencies' of the plan of Saint Gall and the problem of the scale of the plan," *Art Bulletin*, 48: 285–308 (1966).

Evidence from later centuries, however, suggests that the technique of scale drawing was abandoned.

[3] Maria Velte, *Die Anwendung der Quadratur und Triangulatur bei der Grund- und Aufrissgestaltung der gotischen Kirchen*, (Basel, 1951).

[4] James S. Ackerman, "'Ars sine scientia nihil est,' Gothic theory of architecture at the Cathedral of Milan," *Art Bulletin*, 31:85–111 (1949).

[5] Erwin Panofsky, *Gothic architecture and scholasticism* (Latrobe, 1951). Otto von Simson, *The Gothic cathedral* (London, 1956).

The use of these terms derives from Panofsky's introductory essay in *Studies in iconology: humanistic themes in the art of the Renaissance* (New York, 1939), later published as "Iconography and iconology: an introduction to the study of Renaissance art," in *Meaning in the visual arts* (Garden City, 1955). Panofsky distinguishes routine identification of the meaning of conventional motifs in art (iconography) from the "synthetic" analysis of the fundamental symbolic values of works of art in broad cultural contexts (iconology). His pursuit of this distinction between sign-language and nonconventional symbols may have originated in his contact with Ernst Cassirer at the Warburg Institute in Hamburg where Cassirer worked on the second volume, "Mythical thought," of his *Philosophie der symbolischen Formen* (Berlin, 1925). The earlier volume (1923) was a study of language.

It could be wished that studies in iconology would develop into a psychoanalysis of form in art which could carry our understanding of "meaning" far beyond, for example, the study of *Leitmotive* in music, the identifying attributes of gods or saints in art, or the typology of buildings in architecture. Unfortunately, in art history proper, no really new analytic methods, corresponding to the suggestions in Cassirer's work, have been evolved. The tendency today is to announce any study which delves into cultural contexts, in the tradition of the Warburg Institute, as "iconology." Summaries of the field are provided by Jan Bialostocki, "Iconography and iconology," *Encyclopedia of world art* and by William S. Heckscher, "The genesis of iconology," *Stil und Überlieferung in der Kunst des Abendlandes, Bd. III Theorien und Probleme, Akten des 21. Internationalen Kongress für Kunstgeschichte in Bonn 1964* (Berlin, 1967), pp. 239–61.

[6] Rudolf Wittkower, *Architectural principles in the age of humanism* (London, 1949, Third rev. ed. 1962).

[7] Erwin Panofsky, "Die Perspektive als 'symbolische Form'," *Vorträge der Bibliothek Warburg* (1924–25), pp. 258–330.

[8] William Jordy, "The symbolic essence of modern European architecture and its continuing influence," *Journal of the Society of Architectural Historians* 22: 177–87 (1963).

Arnold Berleant, *Music as sound and idea*

Despite the serious obstacles that stand in the way of discussing such questions as what constitutes a piece of music, the papers by Miss Carpenter and Professor Crocker deal sensitively with the issue and make useful and important observations. My comments are intended to assist in clarifying and furthering these discussions. Let me proceed by identifying and then applying two demands that this sort of question calls forth, the first conceptual and the second substantive. There is opportunity here to develop only some conceptual suggestions, and I shall merely be able to indicate the direction in which a substantive contribution might proceed.

When one faces the task of talking about music, as about any art, one encounters a double dilemma. Either you remain silent and safe, or you make use of words which, as a foreign medium that is used here primarily for a nonaesthetic end, must necessarily differ in kind from the art one is speaking of. If you do elect to communicate, you run headlong into a different problem,