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STRUCTURAL SIMILARITIES : A BASIS FOR DESCRIPTIVE COROLLARIES AMONG THE ARTS

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Criticism, as it is currently written, exhibits a general haziness and confusion regarding the way terms are employed. Walter Sutton makes this point very clear :

> It is generally recognized that the confusion existing in critical language is an obstacle to communication. Language barriers separate groups of critics, each of which has tended to develop a specialized vocabulary...
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> A certain amount of specialization is unavoidable. But the peculiar weakness of critical vocabularies is the absence of a common foundation and a lack of agreement about the precise meaning of basic terms... Critics themselves are often not certain of the meaning of terms upon which their arguments depend — a fact that has been too frequently demonstrated in the discussion period following the presentation of critical papers. It is possible for two critics to conduct a technical discussion in which neither has an understanding of the other's meaning, except in his own terms. One of the pressing needs of current criticism is for a broader, generally accepted vocabulary drawn from all relevant areas of experience.[1].

For example, while it may seem clear what it means to say a work of art develops a "theme" with respect to music, how applicable could that be to visual arts such as sculpture, architecture or painting ? Or, critics of painting constantly use words like "movement" and "rhythm" which, unless the metaphors are "unpacked" seem inappropriate since both movement and rhythm imply a

temporal sequence and it is manifestly obvious that paintings do not possess this dimension of time, hence there cannot be any temporal events in their organization. Similarly, literary critics regularly use visual words like "balance" and "proportion" and those are visual terms which, without explanation, seem obviously maladapted. For these reasons, it seems evident that the overlapping vocabulary which critics borrow from other areas of art, as it is now employed, lacks the exactness to be really aesthetically useful.

In this paper I shall try to give an account of how the metaphorical language of art criticism works; that is, describe the physical basis on which it rests so that we can then refine the vocabulary in such a way that it becomes possible to understand more precisely the relationship between elements of various art forms. From this point it should then be possible to establish a common vocabulary by which works of art can be described in an unambiguous way. What this would mean is that if a work like "rhythm" is used in connection with painting, one would know its corollary with respect to overall structure in other media, such as music for example.

To begin, a common vocabulary of descriptive terms depends upon establishing what a work of art entails; in other words, what kind of account can be given of the generalized features of works of art ? One way of going about this is to examine levels of appreciation, or response, to works of art. The hypothesis presented here is that there is a certain hierarchy of levels of response to art and this is both physical and intellectual in nature. For example, it is obvious that a response to art works differs from a response to scientific works in that for works of art, the medium is significant. In art there is a sensuous appeal to the physical elements. This is thought to be an important part of its character; and presumbaly, it is this sensuous appeal which makes it difficult to conceive of the transference of medium. However, an appreciation of art works does not stop at the level of response to physical elements and in addition there is an intellectual level of appreciation having to do with how the physical elements are actually arranged and formed into an intelligible structure. If this assumption is correct, that all types of art involve these two levels of appreciation, then we can anticipate that it should be possible to identify factors corresponding to each of these in the various art forms that exist, and from this point derive a vocabulary which should be more or less common from art form the art form.

This brings up an important point, as we begin working out

shared features, it becomes manifestly obvious that individual arts will differ. Music cannot possess elements in common with a painting because we hear music and we see paintings. There is no overlap of elements between the two because there is no overlap of sensations, and there can be an overlap of two types of art only where there is an overlap of the sensory basis of the arts. This will not rule out, however, elements of an auditory art form performing the *same function* as elements of a visual art form. It will not matter that the physical elements are different, it will not matter that the arrangements are different, it will not matter that the type of associative relationships which may be involved in the art form are different; the fact is that if the various media have similarly functioning elements, then they may be inter-calibrated from one art form to the other. What this means in terms of vocabulary is that instead of a uniformity of vocabulary, the true goal will be use of regular rules of transformation. By this is meant a way of explaining how the equivalent of a term in one art form functions within the sphere of another. Space being a limiting factor in a paper such as this, I shall restrict the present investigation of the physical and intellectual levels of art to music and painting since these art forms involve sight and sound, the basic types of art in terms of involving the major sensory modalities exploited by artists.

The Physical Level of Music : Music makes use of the four characteristics of sound as the raw material of the art : pitch, amplitude, timbre and duration, and this may be determined by an examination of sound and its distinctive characteristics or properties. *Pitch* is determined by the frequency of vibration of a sound wave. The faster the frequency, the higher the note, the slower the frequency, the lower the note. Since each vibration is equivalent to one wave length, the number of wave lengths per unit time is a measurement of pitch. A second characteristic of the sound wave, its *amplitude*, determines volume. The degree of displacement of the sound wave, or its width of vibration accounts for the strength of the disturbance caused by sound waves. The wider the amplitude of the sound wave, the louder the volume. The third element of sound is that of *duration.* This is the decay factor of a tone in which the length of the time of vibration determines the duration of the sound. The fourth and last primary element in music is known as *timbre.* It will be apparent at once that even though the pitch and volume of a note may be the same when played on a piano and a

string bass, they sound very different. This difference is caused by the overtone structure. It is the combination of the fundamental or dominant frequency of a tone together with the many overtones of a note which gives each instrument its characteristic quality of sound, or timbre.

The significant point is that by totally describing music in terms of physical properties we shall have produced an exhaustive description of music in the sense that the themes which make up musical compositions are nothing more than the manipulation of these primary elements of sound, and understanding music involves perceiving the patterns that have been imposed on the physics just described.

The Intellectual Level of Music : It can be demonstrated that the themes of any art form will be composed of the physical constituents of the medium. In music, the primary elements of pitch, amplitude, duration and timbre are put together to form distinctive patterns, or "thematic elements" out of which themes are composed. These building blocks for themes are : melody, rhythm and orchestration. *Melody* consists of patterns of pitch formed by a succession of tones of varying pitch. *Rhythm* is a pattern produced by the manipulation of the primary elements of duration, and to a lesser extent, volume; while *orchestration* is the manipulation of timbre contrast. This "tone color" can be produced by the use of different instruments in a composition, or it can be produced in the same instrument.

In the making of a composition, each of the primary elements is potentially as important as the other, and musical themes can be constructed based upon the contrast of any of them. For example, themes could be composed almost exclusively on contrast of rhythm or upon melodic contrasts or upon differences in sound color; however, in most instances normally one of these will dominate and others will be used for support.

Some alternations can be done without significantly altering themes, but other changes will result in the loss of its identity. For example, when one hears a melodic theme in a musical composition, what is heard is a distinctive pattern of changing sound levels, or tones. Certain alterations can be made, such as playing or singing it faster or slower, and the result will be regarded as the same melody; but if the internal pitch is altered, the melody will not be heard as the original. Similarly, it can be played on a

piano, or sung by the human voice, or played on a violin and the change in timbre is not regarded as significant. One can also make certain modifications of the primary rhythmic structure and these will not be regarded as a significant change. On the other hand, there are certain motifs in musical compositions which are primarily rhythmic, and if one changes those, the theme will have been changed. For example, if the time of the notes of the theme of Beethoven's *Fifth Symphony* is changed so that the last note is not held longer than the first three, or if all four notes are played at the same tempo, the result will not be regarded as the same theme. Thus, sometimes themes involve both rhythmic contrasts and tonal contrasts.

While musical themes involve a distinctive pattern where some elements are subsidiary and others dominate, this structure is not unique to music since the construction of themes in *any* art form will be based on just this organization of the physical properties of the medium so that some become more prominent than others and thus more significant to the integrity of the theme. Themes are then modified by changing the supporting elements and limited modification of the dominant one, so that while the identity of the theme is never lost, it undergoes considerable variation.

The Physical Level of Poetry : As this discussion moves away from music to illustrate corollaries among art types, straightaway it becomes obvious that the amount of stress placed on physical elements will vary among art types. For example, in "pitch" the human voice is naturally tenor, baritone, alto or soprano, but the poet does not take that fact into consideration when, for example, making use of group chrous poetry. Nor is it normally said that it matters whether a female or male reads a poem aloud, for this is considered trivial and insignificant in the appreciation of a poem. Thus, the conclusion may be drawn that pitch is less important an element in poetry than it is in music.

In discussing "duration" in music one sees a functional equivalence to the length (and shortness) of a sound in poetry, while what we call "amplitude" in music will be similar to a stress/unstress of sound in poetry. In themselves these elements are less important than they are in music in that they take on significance depending only upon the particular language in which the poem is written.

Upon close examination it becomes evident that what was referred to as tone color or "timbre" in music resembles the sound

qualities which are distinctive to a particular language, i.e., the phonemes, those distinctive speech sounds which make up the complexion of a language and which vary from language to language.

This discription of functional resemblances demonstrates that poetry, being an auditory art type, involves the characteristics of sound found in music, although the emphasis on these elements is not the same. However, a difficulty in dealing with poetry, as opposed to music, is that the sounds do occur *in language* and the sounds of a poem frequently have references which evoke images. Thus in poetry we normally understand that the sounds of a poem are not the poem; and if one hears the sounds of poetry in an unknown language, it could not be said that the hearer understood the poem. This observation means that the intellectual level of poetry, unlike those of music, does not reside simply in the physical properties of the work. This will be developed below.

The Intellectual Level of Poetry : As in music, the rhythm (or "meter") of poetry involves both dynamics (amplitude) and duration. Consequently there are two kinds of rhythm in poetry : (a) one based on volume or stress rhythm as occurs in English, and (b) a duration rhythm which is based upon the length of the syllables involved, characteristic of Sanskrit and Greek. It is the regularity of rhythm, of its repetitive aspects, which leads us to regard a work as poetry as contrasted to prose.

In music, melody plays an important role, with the exception of some traditions such as the Javanese, Ancient Chinese or African. Its equivalent in poetry, patterns of intonation and pitch, are less important; however, an exception may be Chinese poetry, in which pitch patterns form the basis of the rhythmic structure of the line. In contrast, orchestration (patterns of different tone colors) which play a less significant part than does melody in music, becomes the important element in poetry where this elements can be called "patterns of phonemes". That is, patterns of consonants and vowels, i.e., alliteration, assonance and rhyme.

In addition to rhythmic patterns and phonetic patterns, the intellectual level of peotry, depends on what we shall call "image sequences"; and it is the sequence of images which constitutes the meaning of the poem. Just as there is a contour of rhythm and there is a contour of sound, we can speak of a kind of contour of image in a poem; and in poetry, the intellectual organization of the poetical structure lies in the relationship between the image sequence, the

rhythms and the sound patterns.

This kind of analysis demonstrates that poetry differs from music in that music exploits sounds that contain an inherent structure while poetry does not. The physics of poetry emphasizes the particular structure which is inherent in the language of the poem as well as the meanings of the words. The point is that a kind of structure is inherent in each language. Poets create special patterns of structure which take their importance from the contrast between the poem and the language in which it is written. To appreciate the poem one must know both.

The significant point of the analyses of music and poetry was to show that based on the properties of the medium, we can account for the kinds of contrasts and tensions which occur with regard to the work's structure. The task now will be to show how this is true not only for auditory art forms such as music and poetry, but visual arts as well. That is, there are certain physical characteristics of a medium, the artist exploits these physical properties whether it is done so explicitly or not, and, by making fundamental choices the pattern of the work is established. To demonstrate the applicability of this theory to visual arts we turn now to an examination of painting.

The Physical Level of Painting : The primary elements of painting are composed of two factors : the physical properties of light and the properties of space. What needs to be determined is how these elements function and whether they can be said to be corollaries of the elements discussed above.

It is apparent that the common characteristic of light and sound is that they are both forms of energy which travel in waves. If the nature of wave motion is examined certain features which will help to describe similarities in the manifestation of these two forms of energy may be identified. This will enable comparison between the physics of auditory and visual arts. In the case of light, for example, *hue* the apparent pigmentation of surfaces is determined by the frequency of the wave. Red is characterized as being of lower frequency than blue which is of higher frequency. This is analogous to sound energy in which the frequency determines the pitch; thus, both pitch and hue are functions of frequency, or wavelength, of waves.

Hues have the attribute of both saturation and value, and like hue, these qualities will have their analogous counterparts in sound.

For example, every particular hue can exhibit a lighter or darker value, some blues are lighter than other blues, while some yellows are darker than other yellows. One way of considering value is to think of it as the amount of light energy reflected by a surface. This can be demonstrated by exposing a disk of a certain saturation of green, for example, and systematically increasing and decreasing the amount of light falling upon it. The observer will experience the color as lighter or darker depending on the amount of illumination falling upon the disk. This phenomenon demonstrates the impact of brightness upon the value of a color and is a manifestation of the amplitude of the light wave. Again, a comparable situation in music may be described in which the quality of sound that is referred to as amplitude is aurally detected as volume. Heightening the amplitude of light waves results in the experience of increased brightness, and a manipulation of amplitude in sound waves would result in increased or decreased volume. Thus, both volume in music and value in color are the function of the amplitude of the corresponding wave.

In addition to hue and value, every color also exhibits *saturation.* The term saturation refers to the dullness of brilliance of the hue. Our experience with sound and light involves being exposed simultaneously to mixtures of various wavelengths or frequencies. We characterize the particular proportion of energy coming at the dominant frequency as the degree of saturation of a pigment. Again the similarity to music can be emphasized. Above in the discussion of the primary elements of music it was pointed out that a musical tone consists not only of the fundamental tone, but also overtones. Similarly, in the case of color, there is not a single frequency; rather, a color is a composite of many frequencies of light which co-exist with the dominant one. The degree of saturation is determined by the proportion of the dominant frequency to the others. Thus, the characteristics of timbre and saturation both involve proportions of a mixture of frequencies to the dominant frequency; and therefore can be expressed as the degree of purity of the dominant wavelength.

Besides the very brief statement on color and the physics of light just outlined, it was mentioned that paintings also make use of the characteristics of space in their primary elements. Space functions in painting as time does in music; that is, both define boundaries. However music, insofar as the possibility of structure is concerned, will be simpler than painting, because music being a time organized art is one dimensional; while, painting being space

organized is two dimensional in the sense that space has the characteristics of shape, derived from the color masses, as well as shape, derived from outline.

These primary elements of color (keeping in mind that this entails hue, saturation and value) in combination with the spatial characteristics of shape and contour are used on the intellectual level to create the thematic elements of painting, out of which themes are developed.

The Intellectual Level of Painting : Just as musical contrasts derive from the physics of music, so too contrasts in painting derive from the physical properties of the medium, color and space.

Paintings may not have formally conceived borders, but all paintings are limited in size. However, within this limitation, irrespective of its shape, space nevertheless has certain properties whch may be exploited uniformly without regard to the type or subject matter of the painting. For example, space in a painting may be viewed as a rectangle and may be imagined as divisible in several possible ways. The usual tendency is to divide it into quarters so that the focal point of the painting is the intersection of an imaginary horizontal and vertical axis. These axes need not be geometric in the sense of equal quadrants, but can be shifted higher or lower or from side to side which results in a one-sided effect. In addition to the two axes just described it is of course possible to divide the painting from corner to corner in a diagonal axis. With the exception of Baroque painting, western painting does not make use of diagonal axes for organization whereas Chinese paintings typically make use of diagonal axes to such an extent that it becomes a cliche. The point is that these axes should be considered as possible means of organization of space, and when a painter actually constructs a painting he chooses among these possibilities. Thus, he normally arranges objects in the painting about one or more of these axes or about some combination of them which will be visible through the painting itself.

As objects are arrayed in the painting certain tensions are created. First, tension arises with respect to the axial organization of the painting. An object may be said to be tense in proportion to its distance from the intersection of the axes of the painting. The closer the object is to the intersection the less tense it is, while the further from the intersection the greater the amount of tension it exhibits. Secondly, tensions may be created by the sheer size of

objects. An object may be said to be tense in proportion to the amount of the total area of the painting it occupies, the larger the object the higher tension it creates. Thirdly, an object is tense in so far as its value contrasts with the average background of the painting.

The manner in which these tensions of variations of value, cotour and shape are manipulated creates *rhythm* in painting. Just as movement through time was rhythm in auditory arts such as music, movement through space is rhythm in painting (and architecture and sculpture and other visual arts). But how can "movement" be an appropriate term for a visual art form? Specifically, what it means to say there is movement in a painting is that a directionality is created by patterns of tension contrasts. That is, elements can be regarded as comparable, or moving, which can be arrayed by uniform standards from less to more with respect to any of the three kinds of tensions mentioned above. Thus, rhythm in painting is similar to rhythm as we have discussed it in music in that rhythm is formed by tensions that create interest. However, there will be necessary differences in the construction of rhythm in auditory and visual arts. While all music must have rhythm, because it is a time oriented art, its rhythm will be in terms of the temporal order of music. Paintings too will have rhythm but it will be a function of the spatial organization of the work.

In addition to rhythm, the equivalent of melody will also be found in painting, and this will have to do with *color harmonies* created by the relationships of hue variations and contrasts. Color harmonies are more than just a pleasant arrangement of color, actually referring to the balance of complimentary colors, which is physiological in origin. Due to the physiology of the eye, certain combinations such as red and green, are perceived as complimentary; that is, the presence of one requires the other for a sense of completion. Some paintings use this phenomenon to great advantage; but it should be pointed out that while melody is extremely important in Western music, its equivalent in painting, color harmonies, are not as significant and one can easily imagine a painting without color, as indeed, color harmony is not significant in most Chinese paintings. On the other hand, there may be a dissonance of color harmony which also creates interest, and this is very often exhibited in Fauvist paintings.

The themes of a painting are simply patterns of these elements that are seen as comparable. Their comparability is due to the directionality of their arrangement which is a result of the kinds of

tension factors already described. It is interesting to note how similar the construction of musical themes is to the construction of themes in painting. In music there are no shapes as there are in pain-painting, so in creating themes what the composer must do is to establish early on certain kinds of regularities. These regularities can be heard without difficulty and they are established by controlling the tension factors. For example, the first series of notes of a composition will establish a key signature and a time signature for the piece, and these will serve as a point of reference. These points of reference are equivalent to the two axes in painting so that, in a sense, in music we have a tonic axis and a rhythmic axis. Thus, the minimal requirements for a theme in music will be a series of contrasts in time and a series of contrasts of pitch. Therefore, everything assumes significance as it advances toward or proceeds away from this point of reference.

Finally, there is the equivalent to orchestration in painting, *chiaroscuro*. The function of orchestration, basically is to make use of the timbre values of the instruments in the orchestra to enhance the structural effects of the work. The same can be said of chiaroscuro or the variation of shading of a particular hue in the painting, it is primarily an ornamentation. While the structure of the painting will not hinge on the shading, chiaroscuro does give depth and subtlety to the colors and the way they are used.

The following Table of Resemblances summarizes the shared features of music, poetry and painting on both the physical level of primary elements and how these elements are used to create the building blocks of themes on the intellectual level. We have observed that the materials of a work of art whether audio or visual, posses a certain physics and that the physics of a medium provides the basis for the principles of organization of the art form. It was also shown that despite the variance of media a certain uniformity of relationships obtains. It is this uniformity of relationships which makes it possible to discuss the common features of audio and visual arts using similar terminology.

As it has been worked out, a descriptive vocabulary for aesthetics consists of two kinds of terms : (a) words which describe the primary elements of works of art, and (b) words which describe the patterns and structural relationships which are formed from those physical elements. Whereas the words describing the physical elements will differ from media to media (e.g. pitch in music and hue in painting) the vocabulary describing the intellectual relationships

will be essentially similar (e.g. theme, rhythm, movement, directionality). What is of importance is that at both levels a *similarity of function* has been established which now makes possible common descriptive terminology with some precision.

Beyond this utilitarian value of clarifying the descriptive language as presently used by critics there is another far reaching result of this effort which seems promising. We began with the assumption that response, in the sense of appreciation, to art seems to be of two types : physical and intellectual, and from there we proceeded to identify features in audio and visual art forms which would account for this. Since value terms are linked to our responses it can be anticipated that there are also distinctive value terms appropriate to those levels. By working out the structural equivalences in some detail, simultaneously we have been exposing more clearly the common value frame among the arts. From here a worthwhile endeavor would be to use the family resemblances which demonstrably do exist among arts as a base for constructing a common evaluative vocabulary permitting trans-media standards of evaluation, herftofore thought to be impossible.

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NOTES

[1] Walter Sutton, Modern American Criticism, Prentice—Hall, Inc., Englewood Cliffs, New Jersey, 1963, pp. 286—288.

Music, Poetry and Painting : Table of Corollaries