SCORE, SKETCH, AND SCRIPT

You see no experiment can be repeated exactly. There will always be something different. . . . What it comes to when you say you repeat an experiment is that you repeat all the features of an experiment which a theory determines are relevant. In other words you repeat the experiment as an example of the theory.

Sir George Thomson

1. Score

A score is a character in a notational system. Even in musical notation not every character is a score, but I count as a score every character that may have complaints. This excludes purely syncategorematic characters, for example, without requiring of a score either that it be a complete composition or that it be actually nonvacant. I have broadened the application of "score" to embrace characters of the sort described in any notational system,1 not merely in musical notation. Similarly, I often call the complaints of such characters performances where these complaints are not by ordinary usage performed or even events at all; and

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1 Not, as it observed, "in any notational scheme". The usage here adopted counts only characters of notational systems as scores.

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Reverse

I often call the compliance-classes works, even when these classes are such—e.g., fortuitous aggregates of natural objects—as not to be works in any usual sense. All this I think may help to keep before us both the cardinal example of music and the more general principles illustrated.

A score, we found, defines a work but is a peculiar and privileged definition, without competitors. A class is uniquely determined by a score, as by an ordinary definition; but a score, unlike an ordinary definition, is also uniquely determined by each member of that class. Given the notational system and a performance of a score, the score is recoverable. Identity of work and of score is retained in any series of steps, each of them either from compliance to score-incription, or from score-incription to compliant performance, or from score-incription to true copy. This is ensured by the fact, and only by the fact, that the language in which a score is written must be notational—must satisfy the five stated requirements. No inherent partitioning of the subject-matter is presumed; and performances of a work may vary widely and in many respects.

Redundancy, as noted earlier, is a common and minor violation of notationality. The net effect is that in a chain of the sort described, the score-incriptions may not all be true copies of one another; yet all will be semantically equivalent—all performances will be of the same work. Work-preservation but not score-preservation is ensured; and insofar as work-preservation is paramount, and score-preservation incidental, redundancy is tolerable.

None of our usual natural languages is a notational system. Such discursive languages meet the two syntactic requirements but are exempt from the three semantic requirements. Accordingly, a definition or set of coextensive definitions is seldom uniquely determined by a member of the class defined. And as we have seen, ambiguity is not always to blame; a wheelbarrow belongs to many different compliance-classes of object—English—complies, that is, with many extensionally diverse descriptions, such as "wooden object", "wheeled vehicle", etc. In such a language there is no such thing as the definition, or set of equivalent definitions, that the given object satisfies. But in a notational system, or even a system that misses notationality only through redundancy, all scores for a given performance are coextensive—have all the same performances as compliance.

2. Music

So far, I have been discussing matters of general theory without examining closely any of the presumably notational systems actually used in the arts. Standard musical notation offers a familiar and at the same time a remarkable case. It is at once complex, serviceable, and—like Arabic numerical notation—common to the users of many different verbal languages. No alternative has gained any currency; and apparently no other culture, such as the Chinese or Indian, has developed any comparably effective musical notation over the centuries. The variety and vitality of recent rebellions against it testify to the authority it has acquired.3

3 I do not say to its merits, aesthetic or otherwise; see the discussion of this point later in this section.
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Ordinary musical notation has sometimes been thought to owe its origin to the introduction of keyboard instruments, with their separate keys and spaced tones; but the question just when either a true notation or a true keyboard instrument emerged is so elusive that the hypothesis hardly admits of any conclusive historical investigation. And the hypothesis is antecedently implausible; musical notation no more needed to wait upon invention of the clavichord than alphabetical notation needed to wait upon invention of the typewriter. Development of a notational scheme or system does not depend upon an intrinsic segregation of marks or objects into disjoint and differentiated sets, but is often achieved in the face of virtual continuity in both realms.

In some early medieval musical manuscripts, marks were placed higher or lower over syllables or words of a song to indicate pitch. Only later did horizontal lines come to be added. At first these lines may have functioned as more guides for judging absolute position, like the graduation-marks on a thermometer taken as an analog in-

1 See the footnotes in this chapter. According to C. E. Palmer, The Notation of Medieval Music (New York, W. W. Norton & Co., Inc., 1951), p. 9, this system "is called diatematic from the Greek word for 'interval.' In this writing neumes are essentially 'heightened,' that is, placed at various distances from an imaginary line representing a given pitch, according to their relationship to that line. Certain schools of neume notation display this feature even in their earliest manuscripts. . . . About the end of the tenth century the imaginary line about which diatematic neumes were placed became a real one. At first it was a dry line scratched on the parchment, an idea probably suggested by the use of the guidelines on which the text was written."

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strument. When the lines and the spaces between them become characters of the system, with placement of a syllable or note-sign serving only to pick out one of these characters, elements of a genuine notation emerge. However, I am primarily concerned here not with origins or development but with how fully the language of musical scores qualifies as a truly notational system.

That the syntactic requirements are in general met is quite clear. A note-mark may, indeed, be so placed that we are in doubt about whether it belongs to one note-character or another, but in no case does it belong to both. Overtone note-marks do not count as inscriptions in the system unless and until they are determined to belong to one character rather than to any other. Most characters of a musical score, whether numerals or letters or neither, are syntactically disjoint and differentiated. The symbol scheme is thus substantially notational, and the language of scores truly a language. But is this language a notational system? Does it satisfy the semantic requirements?

If we consider piano scores alone, the language is highly redundant since, for example, the same sound-events comply with the characters for c-sharp, d-flat, e-triple-flat, b-double-sharp, and so on; but redundancy, as we have seen, is not altogether fatal. A more crucial question arises when we consider scores for other instruments as well. In a violin score the characters for c-sharp and d-flat have no
complaints in common. Now if two characters thus have some complaints jointly (in piano scores) and others severally, the two compliance-classes properly intersect, flagrantly violating the requirement of semantic disjointness. This account misses, though, is that since every performance is on one instrument or another, each of the two characters can be considered a vacated atomic character that combines with different specifications of instrument to form different prime characters. The compliance-classes of the two resultant prime characters occurring in piano scores are identical; the compliance-classes of the two resultant prime characters occurring in violin scores are disjoint. Neither pair nor the pair of atomic vacated characters nor the set of all six characters violates the rule of semantic disjointness by more than the redundancy mentioned.

If we suppose the series of whole note, half-note, quarter-note, eighth-note, etc., to be continued without end, the semantic requirement of finite differentiation will be violated. For then by tying note-signs together we can construct characters for notes differing in duration by less than any given fraction of a beat. Hence no sounding of a note could be determined to comply with at most one character. Now of course in any given score or corpus of scores, the number of note-signs, and of flags on any of them, is finite. But there must furthermore be a tacit or express limit on the number of flags permitted by the system at all; otherwise recovery of score from performance will not even theoretically possible. Identity of work from performance to performance will not be ensured, and the primary purpose of a notational system will not be served. Theoretically, any limit would do. Tradition seems to set it for the present at five flags—the 1/128 note.

The main corpus of peculiarly musical characters of the system thus appears on the whole to meet the semantic as well as the syntactic requirements for a notation. The same cannot be said for all the numerical and alphabetical characters that also occur in scores.

First, some compositions are written with a 'figured bass' or 'continuo', allowing performers certain options. Now so long as such scores determine comparatively broad but still mutually disjoint classes of performances, they cause no trouble; what counts is not specificity but separateness. But a system that permits alternative use of figured-bass and specific notation, without rigidly prescribing the choice in every case, materially violates the conditions upon notational systems; for the compliance-classes of some of its characters are properly included in the compliance-classes of other, more general characters. Two score-inscriptions, one in figured-bass and the other

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5 This may be disputed. I am told that a tone of, say, 533 vibrations per second is accepted for either character. But we may regard such a tone either as actually compliant with both characters or (like the meaning of one note) as merely within tolerable limits of deviation in practice. For purposes of illustrating a general point, I choose the latter interpretation here. A more relational notation is still compatible with notationality.

6 The question whether these compliance-classes are in fact disjoint can be answered only by careful examination of the notation in use and some delicate decisions concerning its interpretation.
in specific notation, even though they have some common compliant performance, will not thereby be semantically equivalent; and two performances complying with the former may severally comply with two specific scores that have no compliant in common. The comprehensive language of musical scores, insofar as it offers free choice between figured-bass and specific notation, is thus not truly notational. Rather, it comprises two notational subsystems, and the one in use must be designated and adhered to if identification of work from performance to performance is to be ensured.

Much the same can be said concerning the free cadenza. The performer, again, is given wide scope; and scores providing for free cadenzas have compliance-classes that properly include those of other scores with their solo passages all specified note by note. Unless there is a way of determining in every case whether a solo passage is to be fully specified or indicated as a free cadenza, we must again recognize that the language of musical scores is not purely notational but divides into notational subsystems.

Trouble of a different sort arises from the verbal notation used for the tempo of a movement. That the words come from ordinary object-language does not of itself matter. "Notational" does not imply "nonverbal"; and not every selection of characters, along with their compliance-classes, from a discursive language violates the conditions for notationality. What matters is whether the borrowed vocabulary meets the semantic requirements. Now just what is the vocabulary of tempo? It contains not only the more common terms like "allegro", "andante", and "adagio", but indefinitely many others like the following, taken from a few programs of chamber music: presto, allegro vivace, allegro assai, allegro spiritoso, allegro molto, allegro non troppo, allegro moderato, poco allegretto, allegretto quasi-misurato, misurato, misurato con un poco di moto, rondo alla Polacca, andantino mosso, andantino grazioso, tantissimo, affrettato e sostenuto, moderato e amabile. Apparently almost any words may be used to indicate pace and mood. Even if unambiguity were miraculously preserved, semantic disjointness would not be. And since a tempo may be prescribed as fast, or as slow, or as between fast and slow, or as between fast and between-fast-and-slow, and so on without limit, semantic differentiation goes by the board, too.

Thus the verbal language of tempos is not notational. The tempo words cannot be integral parts of a score insofar as the score serves the function of identifying a work from performance to performance. No departure from the indicated tempo disqualifies a performance as an instance — however wretched — of the work defined by the score. For these tempo specifications cannot be accounted integral parts of the defining score, but are rather auxiliary directions whose observance or nonobservance affects the quality of a performance but not the identity of the work.

On the other hand, metronome specifications of tempo do, under obvious restrictions and under a system univer-

* Chosen casually from programs of works played at the Marlboro Music Festival, Marlboro, Vermont, during six weeks in the summer of 1961.
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sally requiring them, qualify as notational and may be taken as belonging to the score as such.

I have been able to discuss here, rather sketchily, only a few salient samples of relevant questions concerning the standard language of musical scores. The results suggest, however, that it comes as near to meeting the theoretical requirements for notationality as might reasonably be expected of any traditional system in constant actual use, and that the excisions and revisions needed to correct any infractions are rather plain and local. After all, one hardly expects chemical purity outside the laboratory.

Since complete compliance with the score is the only requirement for a genuine instance of a work, the most miserable performance without actual mistakes does count as such an instance, while the most brilliant performance with a single wrong note does not. Could we not bring our theoretical vocabulary into better agreement with common practice and common sense by allowing some limited degree of deviation in performances admitted as instances of a work? The practicing musician or composer usually bristles at the idea that a performance with one wrong note is not a performance of the given work at all; and ordinary usage surely sanctions overlooking a few wrong notes. But this is one of those cases where ordinary usage gets us quickly into trouble. The innocent-seeming principle that performances differing by just one note are instances of the same work risks the consequence—in view of the transitivity of identity—that all performances whatsoever are of the same work. If we allow the least devia-

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tion, all assurance of work-preservation and score-preservation is lost; for by a series of one-note errors of omission, addition, and modification, we can go all the way from Beethoven's Fifth Symphony to Three Blind Mice. Thus while a score may leave unspecified many features of a performance, and allow for considerable variation in others within prescribed limits, full compliance with the specifications given is categorically required. This is not to say that the exigencies that dictate our technical discourse need govern our everyday speech. I am no more recommending that in ordinary discourse we refuse to say that a pianist who misses a note has performed a Chopin Polonaise than that we refuse to call a whale a fish, the earth spherical, or a grayish-pink human white.

The overwhelming monopoly long held by standard musical notation has inevitably inspired rebellion and alternative proposals. Composers complain variously that scores in this notation prescribe too few features or too many or the wrong ones, or prescribe the right ones too precisely or not precisely enough. Revolution here as elsewhere may aim at more or at less or at different control of the means of production.

One simple system devised by John Cage is roughly as follows (see Figure 11): dots, for single sounds, are placed within a rectangle; across the rectangle, at varying angles and perhaps intersecting, run five straight lines for (several) frequency, duration, timbre, amplitude, and succession. The significant factors determining the sounds indicated by a dot are the perpendicular distances from the
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Figure 11

BB

plug to these lines. This system is not notational; for without some stipulation of minimal significant units of angle and distance, syntactic differentiation is wanting. So long as no limit is set upon the smallness of the difference in position that makes a difference in character, no measurement can ever determine that any mark belongs to one character rather than to any number of others. Similarly, under this system, no measurement can ever determine that a performance compiles with one mark rather than others. Furthermore, depending upon just how the symbols are interpreted, syntactic and semantic disjointness may be lacking. The point is not that a work is less rigidly prescribed than by a standard score; for the character-classes and the compliance-classes of a notational system may be of any size so long as they are disjoint and differentiated. Under the proposed system there are no disjoint and differentiated characters or compliance-classes, no notation, no language, no scores.

The objection may be raised that the lack of syntactic differentiation here hardly matters since we have the original drawing and photographic means of reproducing it within any desired or consequential degree of accuracy. But however small the inaccuracy of reproduction, a chain of successive reproductions of reproductions can result in departing to any degree from the original. True enough, we can detect significant deviation by direct comparison with the original (if it is available); yet for two significantly different originals there may be a third (or a copy) that does not differ significantly from either. To arrive at a notation here calls not only for a limit upon significant deviation but also for a means of ensuring disjointness of characters.

Now I am by no means pronouncing upon whether adoption of a system like that described might nevertheless be a good idea. I am neither qualified nor called upon to make such a judgment. I am simply pointing out that much more is involved than a mere shift from one notational system to another. Nor am I quibbling about the proper use of such words as "notation", "score", and "work". That matters little more than the proper use of a fork.

What does matter is that the system in question furnishes no means of identifying a work from performance to performance or even of a character from mark to mark. Nothing can be determined to be a true copy of Cage's
autograph diagram or to be a performance of it. There are
only copies after and performances after that unique ob-
ject as there are only drawings and paintings after a
sketch. The same, of course, may be said of the mediæval
manuscript shown in the frontispiece to this chapter; some-
times revolution is retrogression.

An extreme spirit of laissez faire has led some composers
to use systems that restrict only slightly the performer’s
freedom to play what and as he pleases. Such latitude is
not incompatible with notationality; even a system with
only two characters, one having as compliant all piano
performances beginning with a middle c, and the other
having as compliant all other performances, would be nota-
tional—though for this system there could be only two dif-
ferent works. But, of course, systems with characters having
wide ranges of application often lack semantic disjointness.

At the opposite extreme, some composers of electronic
music, with continuous sound-sources and means of acti-
vation, and with the human performer dispensable in favor
of mechanical devices, seek to eliminate all latitude in per-
formance and achieve ‘exact control’? But except where

9 Roger Sessions, in a passage just preceding the paragraph from which
the quotation heading Chapter IV is taken, writes that electronic
media make possible “the exact control of all musical elements. . . .
Every moment of music not only can but must be the result of the
infinitest calculation, and the composer for the first time has the whole
world of sound at his disposal”; then he proceeds to question the
musical importance of this approach. Peter Yates, in “The Proof of
the Notation”, Arts and Architecture, vol. 82 (1966), p. 36, points out
that “Even a performance by electronic means will vary with the
equipment and acoustics”.

more counting is involved, absolutely precise prescription
cannot be accomplished by any notational system; differ-
entiation requires gaps that destroy continuity. With a
decimal system, for example, absolute precision would re-
quire writing out each specification endlessly; stopping at
any finite number of decimal places results in some inaccu-
racies, however slight, that could accumulate in a long
enough chain to any amount. For exact control, the sym-
bol system would have to be both syntactically and seman-
tically dense—an analog or graphic system; then any im-
precision would arise from mechanical or human errors or
limitations rather than from the symbol system. But then,
also, we have no notation or scores, and ironically the
demand for absolute and inflexible control results in
purely autographic works.

Many of the symbol systems developed by modern
composers have been described, illustrated, and classified
by Erhardt Karkoschka.10 His classification, differently
motivated from ours, recognizes four basic types of system:

(1) Precise Notation (Präzise Notation)—where, for ex-
ample, every note is named.

(2) Range Notation (Rahmennotation)—where, for ex-
ample, only the limits of ranges of notes are set.

(3) Suggestive Notation (Hinweisende Notation)—where
at most relations of notes, or approximate limits of
ranges, are specified.

(4) Musical Graphics.

10 In Das Schriftbild der Neuen Musik (Celle, Herman Moerck, 1966),
pp. 195. My discussion of this searching work is brief and inadequate.
Obviously, a system of either of the first two kinds may or may not qualify as notational in my terminology. Systems of the third kind seem in general to be non-notational; they include, for example, the usual verbal tempo descriptions. But a system prescribing only relations between notes—such as that one is twice as loud or an octave below the preceding note—seems also to belong to the third class and could be notational. The system used for Gregorian chant may have been of this sort. Of his first three classes, Karkoschka writes (p. 80): “A work falls in the three spheres of precise notation, range notation, and suggestive notation if it has the usual coordinate system of space and time as basis, is more sign than sketch, and is essentially linear.” The fourth class, musical graphics, apparently consists mainly of analog systems, lacking both syntactic and semantic articulation—that is, of non-notational, non-linguistic systems that provide diagrams or sketches rather than scores or descriptions.

3. Sketch

Because a painter’s sketch, like a composer’s score, may be used as a working guide, the crucial difference in their status might go unnoticed. The sketch, unlike the score, is not in a language or notation at all, but in a system without either syntactic or semantic differentiation. And while the Cage system described takes certain relationships of dot to line as the only pertinent ones, none among the pictorial properties of a sketch can be dismissed as irrelevant. But in neither case can anything be determined to belong to or to comply with at most one character. Thus, whereas a true score picks out a class of performances that are the equal and only instances of a musical work, a sketch does not determine a class of objects that are the equal and only instances of a work of painting. Unlike the score, the sketch does not define a work, in the strong sense of “define” explained earlier, but rather is one.

Now this is not to deny that a notational system might be established such that sketches belong to its characters. Obviously sketches and also paintings can be sorted into disjoint and differentiated classes in any of various ways; and any of a multitude of correlations can be set up. But quite as obviously, to have two realms that can be so sorted and correlated is not yet to have a system. Only when custom or express stipulation actually effects or selects a classification of each realm and a correlation of the two do we have a system. Such a selection has already been made in the case of standard musical notation, but not in the case of sketches. No pictorial respects are distinguished as those in which a sketch must match another to be its equivalent, or a painting match a sketch to be an instance of what the sketch defines. And no magnitude of difference in any respect is set as the threshold of significance. Differences of all kinds and degrees, measurable or not, are on equal footing. Hence no classes of sketches are picked out as the characters, and no classes of pictures as the compliance-classes, of a notational system.

In short, the sketch—as a sketch—differs from the score.
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not in functioning as a character in a language of a different kind but in not functioning as a character in a language at all. The notational language of musical scores has no parallel in a language (notational or not) of sketches.

4. Painting

That we have ready at hand no notational system for painting does not settle the question whether such a system is possible. Taken at its face value, the question can be answered with an unhesitating but trivial yes. For examples of such notational languages are easily constructed. A library-like decimal system assigning a numeral to each painting according to time and place of production would meet all five requirements. Far afield is the objection that no one can tell by inspection, without further information, whether a given painting complies with a given numeral; for likewise no one can tell by inspection, without further information, whether a given performance complies with a musical score. One has to be able to interpret the score as one has to be able to interpret the numeral; and to know how to interpret a character is to know what complies with it.

The compliance-classes for the language just described will indeed be unit-classes, so that identification of a work from instance to instance will always be from sole instance to same sole instance, but there are no requirements upon the size of the compliance-classes of a notational system. And the uniqueness of instance in painting is irrelevant here since exactly the same question about the possibility of a notational system arises for etching, and is to be answered in the same way. If impressions are assigned numerals according to the plate printed from, the compliance-class of a numeral will usually have many members. Indeed, nothing precludes taking each plate itself as the unique inscription of a character having its impressions as its complaints. Hence for painting and etching alike, notational languages are readily devised.

Yet, clearly, this straightforward answer to the literal question asked misses the main point. For the question of real interest here is whether by means of a notational system the work of painting or etching can be freed of dependence upon a particular author or upon a place or date or means of production. Is it theoretically possible to write a score so defining a work of painting or etching that objects produced by others, before or since the usually designated original or originals, and by other means (than, e.g., the 'original' plate) may comply with the score and qualify as equal instances of the work? In short, could institution of a notational system transform painting or etching from an autographic into an allographic art?

Some reasons that have been given for a negative answer are plainly beside the point. That a visual work is more complex and subtle than a musical performance would—even if true—not matter. For a score need not—indeed cannot—specify all aspects of the complaints nor even every degree of difference in any aspect; a score, as in
figured-bass or free-cadenz notation, may be summary in the
extreme. Nor does the difficulty of making perfect
reproductions of a painting have anything to do with con-
nainment of the work to the unique original.\textsuperscript{12} The per-
formances of the most specific score are by no means exact
duplicates of one another, but vary widely and in many
ways. A moderately good copy and the original painting
resemble each other more closely than do performances of
a Bach suite by Piatigorsky and Casals.

Yet there are constraints. Although a notational system
may pick out any set of disjoint and finitely differentiated
classes in any realm as compliance-classes, not every
compliance-class of every such system counts as a work.
Standard musical notation might be reinterpreted so that
its compliance-classes cut wildly across the standard ones
or even contain no musical performances at all. Or a nota-
tional system might classify pictures according to size or
shape. But in none of these cases does a compliance-class
any more constitute a work than the animals in a zoo form
a species, or the performances of a musical composition
make up a society. Whether the compliance-classes for a
system are works (or societies) depends partly upon their
relationship to the classes accounted works (or societies)
in antecedent practice.

Special care must be taken here. While it would be quite

\textsuperscript{12} Widespread acceptance of this easy and
inap\textsuperscript{12} explanation has inhibited efforts toward real understanding of the matter. Philosophers
of art are not immune from the error; see, for example, Joseph

\textsuperscript{V, A}
the question is whether by application of a notational system works of painting or etching could legitimately be identified with quite different classes. This would call not just for such minor adjustments as occur in any systematization but for a drastic overhaul that would lump together in each compliance-class many antecedently different works. A notational system effecting such a reclassification may of course be applied at will, but scores in it will not constitute real definitions of works of painting. To repudiate the antecedent classification is to disable the only authority competent to issue the needed license.

Thus the answer to the significant question about a notational system for painting is no. We can devise a notational system that will provide, for works of painting and etching, real definitions that depend upon history of production. We can devise a notational system that will provide purely arbitrary nominal definitions that do not depend upon history of production. But we cannot devise a notational system that will provide, for such works, definitions that are both real (consonant with antecedent practice) and independent of history of production.

In sum, an established art becomes allographic only when the classification of objects or events into works is legitimately projected from an antecedent classification and is fully defined, independently of history of production, in terms of a notational system. Both authority and means are required; a suitable antecedent classification provides the one, a suitable notational system the other. Without the means, the authority is unexercised; without the authority, the means are useless.

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5. Script

A script, unlike a sketch, is a character in a notational scheme and in a language but, unlike a score, is not in a notational system. The syntactic but not all the semantic requirements are met. "Script" here is thus not confined to curvilinear inscriptions or to the work of playwrights and film writers. In general, the characters of natural and of most technical languages are scripts; for even if ambiguity is avoided, the compliance-classes of such a language are seldom either disjoint or differentiated from one another.

While most scripts are verbal, notationality obviously does not turn upon the look of marks. We do not arrive at a notational system if we substitute a numeral for each word of English.10 And we do not sacrifice notationality—although we surely jettison practicality—if we translate standard musical notation into a sublanguage of English in such a way that the vocabulary of admitted words meets our five requirements.

One might suppose that scripts but not scores can assert or denote. But we have already seen that means of effecting assertion (or question or command) can be added to or subtracted from a system without affecting notational-

10 Lexicographical order might be taken as the basis for assigning numerals to words. But if we want to assign a numeral to every string of letters, and we place no limit on the length of a string, lexicographical ordering becomes astoundingly complex. However, numerals may be assigned to all such strings on the basis of the different and very simple ordering that begins with lexicographical ordering of all one-letter strings, proceeds to lexicographical ordering of all two-letter strings, and so on. See IV, note 17.
ity; and the idea that scores do not denote seems no better founded. Offhand, indeed, the relation between a term and what it denotes appears quite different from that between a score and its performances or between a letter and its utterances; but no very clear principle seems to underlie this distinction. The criteria that distinguish notational systems from other languages are in terms of interrelationships among compliance-classes, and provide no good grounds for refusing to say that a character in a language of either sort denotes what complies with it.11

Even less can be said for the notion that while we need only know how to recognize a performance of a musical score or an utterance of a phonetic score, we have to understand a script. In both cases, we have to know how to determine what complies with the character. Where a language has few prime characters and fairly simple principles of compliance, so that confident and almost automatic use is acquired rather easily, we tend to regard the language as an instrument we operate. Where the prime characters are many and the principles of compliance are complex, so that interpretation of a character often calls for some deliberation, we tend to speak of having to understand the language. But this difference in complexity, besides being a matter of degree, does not at all coincide with

11 This is not to say that everything a symbol refers to complies with it; exemplification, though a mode of reference, does not constitute compliance. Also we shall see below (section 7) that the utterances and inscriptions of a language may alternatively, and often happily, be construed as equally instances of visual-ordinary characters.

the distinction between notational systems and other languages. For a notational system may have a denumerable infinity of prime characters and an intricate compliance-relationship, while a discursive language may have only two characters—say the words “red” and “square”, with red things and square things as their compliers.

A script, then, differs from a score not in being verbal or declarative or denotational or in requiring special understanding, but simply in being a character in a language that is either ambiguous or lacks semantic disjointness or differentiation. But this prosaic distinction is more consequential than might appear, both in ways already observed and in its bearing upon some currently touchy philosophical questions.

6. Projectibility, Synonymy, Analyticity

To learn and use any language is to resolve problems of projection. On the basis of sample inscriptions of a character we must decide whether other marks, as they appear, belong to that character; and on the basis of sample compliants of a character, we must decide whether other objects comply. Notational and discursive languages are alike in this respect.

With discursive languages, further and major projective decisions have to be made. Even after all questions about what marks belong to what characters and about what objects belong to what compliance-classes have been settled, still an object often complies with several characters.
In object-English, for example, no object or set of objects complies with just one predicate. All green objects examined to date comply with the character "green object", but all comply equally with "green object examined to date or klangen", and with indefinitely many other predicates. Virtually any class that contains all green objects examined to date is the compliance-class of some expression in this language. More generally, the objects in any given selection comply with some English description that has as its other complaints any other given objects. Thus projection from given cases calls for a choice among countless alternatives; and the making of such choices pervades all learning.11

Yet no such questions arise when we are using a notational system. Here nothing is a sample of more than one compliance-class; nothing complies with two characters that are not coextensive. So no choice remains except perhaps, where redundancy is permitted, between coextensive labels; projection even from single sample to compliance-class is uniquely determined. What has happened, in effect, is that the decisions have already been taken in adopting the system. We saw earlier that selection and

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11 What constitutes the grounds for choice here is a moot question. Scientists and metaphysicians are wont to point to ontological difference between "natural kinds" and other classes. Philosophers often hold that members of a favored class share some real attributes or essence, or bear some absolute resemblance to each other. I think the distinction depends rather upon linguistic habit. For a detailed discussion of the problem of projectibility, see JFE.
that are specifiable in a given notational system are thus coextensive.

The distinction between real and nominal defining still stands, as is illustrated by the difference between writing a score for a work already extant in performance and composing a new work. Once the language is given, a score or class of coextensive scores is in the first case uniquely determined by a performance, and a class of performances is in the second case uniquely determined by a score. But in both cases, all scores for a performance assign it to the same compliance-class: nothing is a performance of more than a single work. Where two works are performed in succession the resultant event, though it contains performances of each of the two, is itself a performance of neither but of the conjoinder score.

That all scores for a performance are coextensive does not imply that all are synonymous. Two coextensive characters, \( c_1 \) and \( c_2 \), are not synonymous unless every two parallel compounds of them are also coextensive. That is, if replacement of \( c_1 \) or \( c_2 \) by the other in some compound character \( k_1 \) yields a character \( k_2 \) with an extension different from that of \( k_2 \), then \( c_1 \) and \( c_2 \) may on good grounds be said to differ in meaning. Furthermore, where two terms thus differ in meaning, even coextensive parallel compounds of them may be considered, derivatively, to differ in meaning. We noticed earlier that a c-sharp-sign and a d-flat-sign (equal in indicated duration, etc.) as they occur in piano scores have the same compliance-class of sounds, but that

16 The criterion of difference in meaning here employed is that set forth in my papers "On Likeness of Meaning" and "On Some Dif-

since the effect of adding the natural-sign to these characters is to negate the sharp-sign and the flat-sign alike, the compliance-class for the c-sharp-natural-sign consists of c-sounds and is disjoint from the compliance-class, consisting of d-sounds, for the d-flat-natural-sign. Thus the c-sharp-sign and the d-flat-sign, even though coextensive, are not synonymous; and neither are two scores, even if coextensive, that are parallel compounds of these characters.

References About Meaning (cited in I, note 19). The primary extension of a character consists of what that character denotes; a secondary extension consists of what same compound of that character denotes. Two characters differ in meaning if they differ in primary extension or in any of their parallel secondary extensions. As applied to natural languages, where there is great freedom in generating compounds, this criterion tends to give the result that every two terms differ in meaning. No such result follows for more restricted languages; and indeed for these the criterion may need to be strengthened by providing further that characters differ in meaning if they are parallel compounds of terms that differ either in primary or in parallel secondary extensions.

17 The characters here in question comprise a note-sign, a sharp-sign or flat-sign (perhaps from the signature), and a natural-sign that neutralizes the sharp-sign or flat-sign. The order of precedence of the note-sign and the sharp-sign or flat-sign makes no difference; but a natural-sign cancels all and only the sharp-signs or flat-signs that precede it and are (immediately or remotely) associated with the note-sign. To modify a c-double-sharp to a c-sharp, we must suffix a natural-sign and then another sharp-sign, so that the unabbreviated result is c-sharp-sharp-natural-sharp-sign.

18 All never-performed scores have the same (i.e., no) performances as recipients. They are scores for 'different works' in the oblique sense that pictures of unicorns and pictures of zebras are pictures of different things. In neither case is there a difference in primary extension. The score for Jones's never-performed Symphony No. 3 and the score for his never-performed Piano Concerto No. 3 are strictly
SCORE, SKETCH, AND SCRIPT

Wherever there are coextensive nonsynonymous characters, a question may arise concerning principles of preference among them in any given context. Although “rational animal” and “featherless biped” be coextensive, still “All men are rational animals” is said—upon rather obscure grounds—to be analytic, and “All men are featherless bipeds” to be synthetic. How do matters stand in a system that is notational except for containing some coextensive characters? Musicians tell us that in a traditional piano score the usual rules of composition unequivocally decide whether a c-sharp-sign or a d-flat-sign should occur. Although no difference in performance can result, the wrong choice seems to violate a rule of grammatical etiquette comparable to that governing, say, the use in English of the prefixes “un” and “in”. Indeed, we might say that using a c-sharp-sign where a d-flat-sign belongs is like saying that such a choice is intolerable (or inbearing).

A more substantive consideration might be found in the relation of a work to its siblings for other instruments. As we have seen, specification of instrument is an integral part of any true score in standard musical notation; and a piano work and the violin version of it, for example, count strictly as different works. Nevertheless, certain violin performances rather than others are accepted as performances of the violin version of the piano work. Let us sup-

just the Jones-Symphony-#9-score and the Jones-Piano-Concerto-#3-score. Replacement of a character in the Jones-Symphony-#9-score will result in the Jones-Symphony-#9-score only if the replaced and replacing characters are coextensive and furthermore, in the way explained above, synonymous.

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pose that for a given piano work the violin performances so recognized have a c-sharp and not a d-flat at a given place. The score for the violin version of the piano work must then have at that place a c-sharp-sign and not a d-flat-sign. This would provide grounds for choosing the c-sharp-sign in the piano score itself; the piano work might be said to have the c-sharp analytically in that in versions of the work for other instruments, where the c-sharp-sign and the d-flat-sign are not coextensive, a c-sharp is mandatory.

How close such a criterion comes to the usual notion of analyticity is hard to say, since that notion is so hopelessly confused. But musical notation seems to offer so much less opportunity than does English for befuddlement over analyticity that some philosophers might do well to stop writing and start composing.

7. Literary Arts

The text of a poem or novel or biography is a character in a notational scheme. As a phonetic character, with utterances as compliant, it belongs to an approximately notational system.13 As a character with objects as compliants, it belongs to a discursive language.

Since in the latter case the compliance-classes are not disjoint or differentiated, texts are not scores but scripts. If compliance-classes of texts constituted works, then in some cases whether an object belongs to a given work...

13 The approximation will not be very close in English, with its wealth of homonyms, inconstancies, etc., but may be fairly close in a language like Spanish.
would be theoretically indeterminable, and in some cases an object would be an instance of several works. But obviously works of literature are not compliance-classes of texts. The Civil War is not literature, and two histories of it are different works.

Nor can the work of literature be identified as the class of utterances compliant with the text taken as a phonetic character. For even though the text be a true score, with an exclusive disjoint and differentiated compliance-class, an utterance obviously has no better title to be considered an instance of the work than does an inscription of the text. Utterances are not the end-products as are performances in music. Moreover, the utterances themselves might equally well be considered either as coextensive with inscriptions of the text or as belonging to a converse-phonetic language and having the inscriptions as complainants. Or since compliance is not always asymmetrical, utterances and inscriptions could be considered as having each other as their complainants. Or we might take written and spoken English say, as separate and parallel languages. A character of the one consists of inscriptions, a character of the other consists of utterances, while “character of English” can be taken either way if no restrictions are imposed by the context. But perhaps the simplest course is to consider a character of English to have utterances and inscriptions alike as members. This merely extends in a convenient and appropriate way the practice of counting widely varying marks as members of a single character. Syntactic disjointness—required of a notational scheme and hence of any language, not merely of a notational system—

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will have to be preserved by refusing to accept any utterance as belonging to two different characters. Just as among certain matching letter-inscriptions some belong to the first letter of the alphabet while some belong to the fourth, so among utterances consisting of a hard-g sound followed by a long-a sound followed by a t-sound some will belong to the same character as inscriptions of “gate” while some will belong to the same character as inscriptions of “gast”.

A literary work, then, is not the compliance-class of a text but the text or script itself. All and only inscriptions and utterances of the text are instances of the work; and identification of the work from instance to instance is ensured by the fact that the text is a character in a notational scheme—in a vocabulary of syntactically disjoint and differentiated symbols. Even replacement of a character in a text by another synonymous character (if any can be found in a discursive language) yields a different work. Yet the work is the text not as an isolated class of marks and utterances but as a character in a language. The same class as a character in another language is another work, and a translation of a work is not an instance of that work. Both identity of language and syntactic identity within the language are necessary conditions for identity of a literary work.

Obviously I am not concerned with what distinguishes some scripts as “truly literary” works. Nevertheless, equating a poem with its text may arouse some protest, on the ground that the more immediate or intrinsic properties of classes of inscriptions and utterances hardly coincide with the aesthetically important properties of the poem. But in
the first place, defining literary works no more calls for setting forth all their significant aesthetic properties than defining metals calls for setting forth all their significant chemical properties. In the second place, immediacy is a suspect notion and aesthetic relevance a subtle one; and no end of confusion has arisen from association of the two.

To identify the literary work with a script is not to isolate and dessicate it but to recognize it as a denotive and expressive symbol that reaches beyond itself along all sorts of short and long referential paths.

We have seen that a musical score is in a notation and defines a work; that a sketch or picture is not in a notation but is itself a work; and that a literary script is both in a notation and is itself a work. Thus in the different arts a work is differently localized. In painting, the work is an individual object; and in etching, a class of objects. In music, the work is the class of performances compliant with a character. In literature, the work is the character itself. And in calligraphy, we may add, the work is an individual inscription.20

In the drama, as in music, the work is a compliance-class of performances. The text of a play, however, is a composite of score and script. The dialogue is in a virtually notational system, with utterances as its compliant. This part of the text is a score; and performances compliant with it constitute the work. The stage directions, descriptions of scenery, etc., are scripts in a language that meets none of the semantic requirements for notationality; and a performance does not uniquely determine such a script or class of coextensive scripts. Given a performance, the dialogue can be universally transcribed: different correct ways of writing it down will have exactly the same performances as compliant. But this is not true of the rest of the text. A given setting, for example, may comply with extensionally divergent descriptions; and its compliance with some descriptions may be theoretically undecidable. The parts of the text other than the dialogue count not as integral parts of the defining score but as supplementary instructions. In the case of a novel consisting partly or even entirely of dialogue, the text is the work; but the same text taken as the text for a play is or contains the score for a work. The script for a silent film is neither the cinematic work nor a score for it but, though used in producing the film, is otherwise as loosely related to the work as is a verbal description of a painting to the painting itself.

8. Dance

The possibility of a notation for the dance was one of the initial questions that led to our study of notational systems. Because the dance is visual like painting, which has no notation, and yet transient and temporal like music, which has a highly developed standard notation, the answer is not altogether obvious; and ill-grounded negatives...
and irresponsible affirmatives have been put forth about equally often.

The ill-grounded negatives rest on the argument that the dance, as a visual and mobile art involving the infinitely subtle and varied expressions and three-dimensional motions of one or more highly complex organisms, is far too complicated to be captured by any notation. But, of course, a score need not capture all the subtlety and complexity of a performance. That would be hopeless even in the comparatively simpler art of music, and would always be pointless. The function of a score is to specify the essential properties a performance must have to belong to the work; the stipulations are only of certain aspects and only within certain degrees. All other variations are permitted; and the differences among performances of the same work, even in music, are enormous.

The irresponsible affirmative answers consist of pointing out that a notation can be devised for almost anything. This, of course, is irrelevant. The significant issue is whether in terms of notational language we can provide real definitions that will identify a dance in its several performances, independently of any particular history of production.

For such real definitions to be possible there must, as we have seen, be an antecedent classification of performances into works that is similarly independent of history of production. This classification need not be neat or complete but must serve as a foil, a scaffolding, a springboard, for the development of a full and systematic classification.

That the requisite antecedent classification exists for the dance seems clear. Prior to any notation, we make reasonably consistent judgments as to whether performances by different people are instances of the same dance. No theoretical barrier stands in the way of developing a suitable notational system.

Practical feasibility is another matter, not directly in question here. The antecedent classification is so rough and tentative that the decisions to be made are many, intricate, and consequential. And inadvertent violation of one of the syntactic or semantic requirements can easily result in a non-notational language or a system that is no language at all. Bold and intelligent systematization is called for, along with a good deal of care.

Among notations that have been proposed for the dance, the one called Labanotation21 after the inventor, Rudolf Laban, seems deservedly to have gained most recognition. An impressive scheme of analysis and description, it refutes the common belief that continuous complex motion

21 Laban was working on the matter in Vienna as early as the 1920's. He published Choreographie (Jena, Hugo Diederich, 1928); Effert, with F. C. Lawrence (London, MacDonald & Evans, Ltd., 1947); and Principles of Dance and Movement Notation (London, MacDonald & Evans, Ltd., 1956). A convenient and well-illustrated exposition by Ann Hutchinson is available in a paperback book, Labanotation (Norfolk, Conn., New Directions, 1961), which is cited in the next three footnotes. One of the competing systems has been proposed by Rudolf and Joan Benezra in An Introduction to Dance Notation (London, Adam & Charles Black, Ltd., 1956). I leave it as an exercise for the reader to compare the Laben and Benezra systems in the light of the principles set forth in the present book.
is too recalcitrant a subject-matter for notational articulation, and discredits the dogma that successful systematic description depends in general upon some inherent amenable- 

bility—some native structural neatness—in what is described. Indeed, the development of Laban's language offers us an elaborate and intriguing example of the process that has come to be called "concept formation".

How far, though, does the system meet the theoretical requirements for a notational language? I can answer only tentatively, from an inadequate knowledge of the system. That the characters are syntactically disjoint seems clear. Satisfaction of the requirements of finite differentiation is less easily ascertained; but Laban avoids a good many pitfalls here. For example, one naturally looks for a violation in the directional indications, since if every different angle of a line stands for a different direction, neither the syntactic nor the semantic requirement of differentiation is fulfilled. But in Labanotation, direction of facing is indicated by a "direction pin" in any of eight positions disposed at equal intervals around the full horizontal circle (Figure 12):

\[ \text{Figure 12} \]

and a direction halfway between any two proximate directions among these eight is indicated by combining the signs for the two (e.g., as in Figure 13).

\[ \text{Figure 13} \]

This device admits of no further iteration to indicate directions between two proximate directions among the sixteen. Elsewhere in the system, differentiation is often achieved just as decisively as here. One is alerted for trouble by such a statement as: "The relative length of the direction symbol shows its time value"; but here, as in music, time is divided into beats, and the least difference in duration provided for in the language is presumably the same as in standard musical notation.22

Like standard musical notation, Labanotation provides for more and less specific scoring, and so violates the condition of semantic disjointness. The ad lib signs and the explicit license to describe in detail or leave open certain

22 Or less. The least duration indicated by any of the characters actually presented or mentioned in Labanotation (p. 52) is one-sixteenth of a beat, probably because at even the slowest normal tempo, that is the shortest time in which a dancer can be expected to execute a distinct and recognizable unit of movement. But so long as a limit is set, just where does not matter.
aspects of a movement have much the same effect as do the free-cadenza and figured-bass notations in music. The result is that identity of a work will not be preserved in every chain of alternating steps between scores and performances. The flexibility offered may be welcomed by the choreographer or composer, and does not affect score-to-performance steps; but it leaves the performance-to-score steps insufficiently determined until the specificity of the scoring is stipulated. Labanotation as a whole is a discursive language comprising several notational subsystems; and in some cases, a class of performances may be a work relative to one but not another of these notational systems.

So far, I have been considering only the basic vocabulary. Some of the other symbolisms introduced cannot be embraced in any notational system. A prime example is the use of words or pictures to indicate physical objects involved in the dance. If object-words in general are ad-

23 For use of the ad lib signs, see Labanotation, pp. 81, 187. On permitted variance in specificity of scoring, see e.g., pp. 59, 262. In such passages we find, I think, the significance of the introductory statement: “Labanotation allows for any degree of specificity” (p. 5). Read as meaning that the system allows for specification to within any given degree of precision whatsoever, this statement would imply lack of differentiation.

Incidentally, Labanotation seems to be redundant, although whether alternative symbolisms are actually contentious is not always clear from the exposition (e.g., see p. 144). We have seen that contentious characters in music sometimes differ in meaning through entering into parallel compounds that differ in extension; so far I have not discovered any analogue of this in Labanotation.

dance but for human movement in general, and went on to
develop and supplement the system as a means for analyz-
ing and classifying all human physical activities. The need
for some such system is especially apparent, for example,
in industrial engineering and in psychological experimen-
tation. Whether the experimenter or the subject repeats his
behavior on a second occasion depends upon the criteria of
identity of behavior that are applied; and the problem of
formulating such criteria is the problem of developing a
notational system. As for nonhuman movement, a zoo-
ologist has recently proposed an entertaining and illuminating
method of codifying the various gaits of horses.35

9. Architecture

The architect's papers are a curious mixture. The specifi-
cations are written in ordinary discursive verbal and nu-
merical language. The renderings made to convey the ap-
pearance of the finished building are sketches. But what of
the plans?

Because a plan is a drawing, with lines and angles subject
to continuous variation, the first guess would be that it is
technically a sketch. But on the plan are measurements in
words and figures. This suggests that we have here a com-
bination of sketch and script. But I think this again is
wrong. In the first place, the drawing is used only to indi-
cate the relative location of elements and measurements.

35 See Milton Hildebrand, "Symmetrical Gait of Horses", *Science*,
vol. 150 (1965), pp. 703-708.

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Careful drawing to scale is merely for convenience and
elegance; a rough and distorted version, with the same
letters and numerals, qualifies as a true copy of the most
precisely drafted blueprint, prescribes the constructive
properties as rigorously, and has the same buildings as
complaints. In the second place, while the numerals as
characters in the unlimited set of fractional numerals are
scripts, the numerals admissible in architectural plans are
tacitly restricted—e.g., so that measurements are to be
given only, say, to the nearest thirty-second of an inch. So
long as any such restriction is in force, the admitted part
of numerical language does not, like the whole, violate the
condition of finite differentiation, but qualifies as nota-
tional. Thus although a drawing often counts as a sketch
and a measurement in numerals as a script, the particular
selection of drawing and numerals in an architectural plan
counts as a digital diagram and as a score.

Architectural plans, like musical scores, may sometimes
define works as broader than we usually take them. For
the architect's specifications of materials and construction
(whether written out separately or on the plans) can no
more be considered integral parts of a score than can the
composer's verbal specifications of tempo. An architect is
free to stipulate that the material of a foundation be stone,
or that it be granite, or that it be Rockport seam-faced
granite. Given the building, we cannot tell which of these
nesting terms occurs in the specifications. The class of
buildings picked out by the plans-plus-specifications is nar-
rower than that defined by the plans alone; but the plans-
plus-specifications make up a script, not a score. Thus the
question whether two buildings are instances of the same work, relative to the architect's total language, is an indeterminate one. Relative to the notational language of plans, it is determinate; but the work is then identified with a more comprehensive class than is customary. However, exact conformity between definition and ordinary practice is never required or to be expected.

We must not be misled by the fact that the compliance of a set of plans happens so often to consist of but one building; or by the preeminent interest or value that a given instance of an architectural work may have; or by the emphasis sometimes laid upon immediate supervision, by the architect, of the process of construction. Many a composition is played only once; certain performances of other pieces have exceptional importance; and a building or performance executed under the direction of the designer or composer, while a more personal product and perhaps much better (or much worse) than another building or performance from the same plans or score, is not therefore a more authentic or original instance of the work. Nevertheless, the work of architecture is not always as surely disengaged from a particular building as is a work of music from a particular performance. The end-product of architecture, unlike that of music, is not ephemeral; and the notational language was developed in response rather to the need for participation of many hands in construction. The language thus has weaker warrant for, and meets more resistance in, overriding the primordial autographic stage of the art. Plainly enough, all houses complying with

the plans for Smith-Jones Split-Level #17 are equally instances of that architectural work. But in the case of an earlier architectural tribute to womanhood, the Taj Mahal, we may bridle at considering another building from the same plans and even on the same site to be an instance of the same work rather than a copy. We are not as comfortable about identifying an architectural work with a design rather than a building as we are about identifying a musical work with a composition rather than a performance. In that architecture has a reasonably appropriate notational system and that some of its works are unmistakably autographic, the art is autographic. But insofar as its notational language has not yet acquired full authority to divorce identity of work in all cases from particular production, architecture is a mixed and transitional case.

In the present chapter I have been applying, chiefly to symbol systems in the arts, principles developed in Chapter IV in response to questions raised in Chapter III. The reader will already have discerned that these principles have some bearing upon problems left unresolved in the first two chapters. I now turn to those problems again and to other unfinished business.