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THE SOUNDS OF POETRY

by

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The Sounds of English Poetry

Chapter I

Introductory

Of the systems which have been used or proposed for the analysis of the sounds of English poetry, no one system accommodates all the data. Each system is deficient in some way as a solution to the reader's problem of understanding what phonetic directions are being given to him in a printed poem. The object of this study is to suggest a system which can assist literary criticism by providing a more ample and a more precise analysis of the sounds of poetry than has heretofore been available. The point of view taken in this study is that the sounds of poetry can be detected and analyzed through a synchronic and non-semantic approach, and that such approach can reveal, through dissection and analysis of the inherent structural forces within that selection, the basic rhythms, grades of stress, delicacy of phrasal distinctions, and the metric of any selection. The hope is that such analysis will supplement traditional prosody by making available precise details to support placement of metrical ictus and to illuminate comparisons of style. The aim is not to supplant conventional prosody but to extend it and to serve it with objective descriptive aids.

The approaches to the problem of ascertaining and describing the phonetic directions conveyed by an English poem can be generally classed as either prosodic or pre-prosodic.¹ Prosodic systems take into account the patterns and regularities of sound phenomena discoverable in the printed poem. The main provision of prosodic systems is metric, that is, description through the detection and count of regularly recurring units or unit markers such as lines, syllables, feet, or stresses. The several English metrics are syllable-count, syllable-stress, accentual,² and, in addition, isometric systems proposed for the stress meters.³ The secondary provision of prosodic systems is what is termed in this study pre-metric, that is, the supplementary note of sound repetition such as rhyme, assonance, alliteration, and series of echoes. Pre-prosodic systems provide the findings of phonetic and phonemic linguistic analyses, that is, description through the detection and note of distinctive segmental sounds, of the physical and perceptual cues of those sounds, and of the varieties and phrasal fall of stresses, pitches, and junctures. Each approach provides valuable description, but in prosodic systems metric analysis sacrifices detailed note of phrasal variety to the counting of units and to a binary concept of stress, and pre-metric analysis is seldom thoroughly explored. In pre-prosodic systems concern is not extended to regularities and to patterned sound. Yet both variety and regularity of sound are present in poetry and a system is needed which provides for both phenomena. A few examples suffice to show the deficiency in scope of each system, beginning with the prosodic.

Prosodic systems, although they are convenient for the literary scholar because they work as he must from the printed poem toward the proposed sound, are limited in the amount of sound discriminations they can account for. Since most English verse from the years 1600 to 1900 was stress verse written in foot patterns modelled on Greek prosody, the metric system normally used for describing this verse is a foot-pattern analysis. Thus, for example, Shakespeare's line

Full fathom five thy father lies

is normally described as a line of iambic tetrameter, and probably, in response to some signal of strength in the first and fifth syllables, would be marked / / \ / / \ x / in the first and third feet.

Full fathom five thy father lies

The presumptions of this analysis are that verse implies meter, that the nature of meter is an intended rhythm pattern in stress, that the nature of that rhythm is binary, and that the line is a unit. The main defects within such analysis are that phrasal structure is ignored except for note of caesura, if it is present, and that discriminations cannot be made among like feet or between lines of the same meter. For example, foot-pattern analysis does not note the fact that in the Shakespeare line sense and grammatical structure divide the line into two phrases, nor can it describe the difference felt in rhythm between Shakespeare's line, and Donne's line in the same meter,

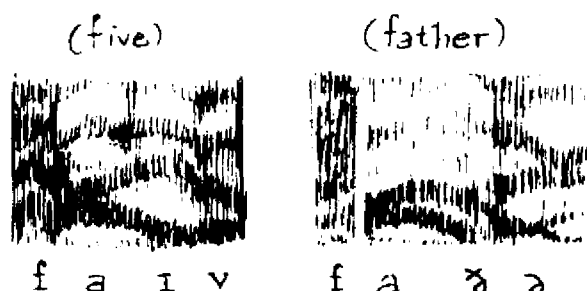
Send home my long strayd eyes to mee,⁴

Foot-pattern analysis cannot show that the phrase structure in the Donne does not divide the line into balanced halves as in the Shakespeare, nor can it show the difference in quality between the iambic second feet of the lines except by the extreme of marking "my long" as another spondee.

Prosodic systems all include some account of pre-metric (supplementary) sound patterns such as rhyme, assonance, and alliteration, and the alliteration with "f" and the assonance with "lies" in the Shakespeare would normally be noted. A sensitive reader might also notice the repetitions of "th." The main defects of such supplementary analysis are that it does not ordinarily distinguish the actual pronunciation of all the letters on the page and that it does not weigh all repetitions.⁵ For example, in actual pronunciation the sound resemblance of "fathom" and "father" continues into the final vowels, reduced central "uh"s or schwas, but even if the fact is recognized there is no way of showing it. Moreover, non-alliterative or non-assonantal repetitions are normally by-passed. For example, the bracketing force of the "l" in "full" and "lies" would not normally be noted.

Pre-prosodic approaches, although they provide description of discriminations among sounds, do not note patterns and are inconvenient for the literary scholar because they are all studies which begin with actual sound and work toward transcription or machine representation. They are thus difficult to employ where study is constrained to move from print to sound. For example, acoustic phonetic instrumentation

gives results in the form of a continuum which is difficult to segment into units, although units are what the prosodist needs. It is a long, technical step from a spectrogram even to the tentative identification of possible stress on particular syllables.



Acoustic study tends to delve into what are micro-details to the prosodist's eye and to avoid those units which most interest him, because they are gross segments to the acoustic phonetician's eye.

The phonemic pre-prosodic approach promises more than the acoustic phonetic approach because it does segment sound into units, but phonemic systems vary from one another in their definition of the phoneme, in the sets of phonemes proposed, and in the extent to which the phonemic principle is carried, and none as such extend to noting metric pattern or sound repetitions. In the phonemic transcription of Daniel Jones, ⁷ for example, our sample line becomes:

ful 'fɛm faiv θai 'fɑθə laiz

The defect for the reader faced with a printed poem is that the system of transcription, aside from not noting regularities, cannot be applied in full. For example, Jones' system includes note of all stresses, and the sample line should therefore include the main stresses when read for sense, but since there is no sure principle in his system by which they can be marked from a printed page, a reader cannot ascertain them and can only mark, as I have, the lexical stresses. The literary critic's perception may profit, however, since phoneme transcription does uncover sound similarities hidden by ordinary letters, such as that of the vowels in the second syllables of "fathom" and "father," but even to take such note of repetition is to move out of phonemics back into traditional prosodic observations.

Another pre-prosodic approach, that of structural linguistics, promises even more, because it introduces the "prosodies" as supra-segmental phonemes, but it supplies nothing to indicate rhythm and takes no notice of repetitions. In a structuralist transcription given by Epstein and Hawkes the sample line becomes:

$$\begin{array}{c} \overset{2}{\wedge} \quad \overset{1}{\wedge} \quad \overset{2}{/} \quad \left| \quad \overset{2}{\setminus} \quad \overset{3}{/} \quad \overset{1}{\wedge} \quad \overset{1}{/} \\ \text{Full} + \text{fathom} + \text{five} \quad \left| \quad \text{thy} + \text{father} + \text{lies} \# \end{array} \quad (8)$$

In this transcription the line is marked with phonemes of four levels of pitch (low 1 to high 4) and four degrees of stress (primary //, secondary /^/, tertiary /\/, weak /~/, and with junctures (pitch sustension /|/ and pitch drop /#/).⁹ This transcription does show that stresses vary in weight in the language and that the line divides in

half structurally, but the pitch levels describe a peculiarly flat intonation which raises doubts, and, in addition, the scholar in his study is given no clear set of principles upon which he can securely base the disposition of these lesser degrees of stress.

As this brief review shows, none of the conventional prosodic systems, not even the more recent pre-prosodic systems of analysis, provides, alone, a fully satisfactory system of analysis for the use of the literary critic. Some attempts to combine pre-prosodic and prosodic approaches have been made, but they also have deficiencies. For example, when Epstein and Hawkes attempt to blend prosody and suprasegmental phonemes, the line becomes:

$$\begin{array}{ccccccc} \hat{} & \hat{} & \hat{} & \hat{} & \hat{} & \hat{} & \hat{} \\ \text{Full} & \text{fathom} & \text{five} & \text{thy} & \text{father} & \text{lies} & \\ \cup & - & \cup & - & \cup & - & \cup & - \end{array} \quad (10)$$

The marking above the line employs the Trager-Smith four phonemic degrees of stress; the marking below is in traditional prosody's two stresses as Epstein and Hawkes give them. It is curious that Epstein and Hawkes in their study abandon the segmental phonemes so that sound repetition is ignored. Since, however, Epstein and Hawkes specify that it is a phonetic fact that "the second stress in a series of the same kind is phonetically, though not significantly, stronger than the first,"¹¹ the line has iambic alternation throughout and no provision is made for spondees. If the second of a similar pair is "stronger," then the four phonemic degrees expand to eight phonetic degrees,¹² and although the prosodist cannot object to the principle

of descriptive refinement he still has no satisfactory basis on which to mark lesser degrees of stress with confidence¹³ and he has also lost the traditional refinement of being able to mark adjacent syllables as alike in stress. Pitch, moreover, has been set aside as irrelevant, although Epstein and Hawkes base the number of possible iambic feet on internal pitch as well as stress and pause combinations and state that "with them, the figure for all possible or probable iambic units in English prosody is 6236."¹⁴ As the prosodist has always suspected, the poet has resources for variety, but here the principle of economy has had the odd result of reducing all rhythmic possibilities to a binary metric with a consequent extreme proliferation of particular cases.¹⁵

This binary prosodic theory, moreover, leads to such linguistic scanning as:

² ^ ∪ ∪ ^ ∪ \ 3/ ∪ 1/ # 2 ∪ ^ ∪ ∪ 2 / 2 ∪ ∪ 3/ \ 1 #
 This is | the forest primeval, | the murmuring | pines and | the hemlocks #
 — ∪ ∪ — ∪ — — ∪ ∪ — ∪ — ∪ — — — ∪ ∪ — —

(16)

Here a complicated metric is created by what was supposed to be a simple binary stress system, and the concept of the phrase, although marked, is in turn submerged by the metric.

Another combination of pre-prosodic and prosodic is that of Seymour Chatman who attempts to combine acoustic analysis and perceptual tests with prosody, but after his extensive investigation of a Shakespeare sonnet, his results merely show traditional metrics with a

wide area of judges' agreement, and a limited area of disagreement on ictus. Line 9, for example, is given as:

$\overset{\cup}{\text{But}} \overset{-}{\text{thy}} \mid \overset{\cup}{\text{et}} \overset{-}{\text{er}} \overset{\cup}{\text{nal}} \overset{-}{\text{sum}} \overset{\cup}{\text{mer}} \overset{-}{\text{shall}} \mid \overset{\cup}{\text{not}} \overset{-}{\text{fade}},$
(17)

and it is probable the line from The Tempest would be:

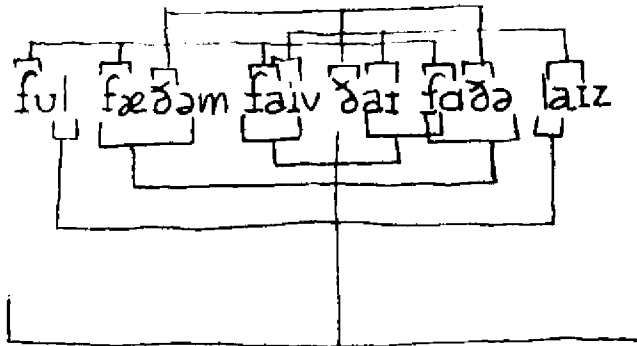
$\overset{\cup}{\text{Full}} \overset{-}{\text{fath}} \overset{\cup}{\text{om}} \overset{-}{\text{five}} \mid \overset{\cup}{\text{thy}} \overset{-}{\text{father}} \overset{\cup}{\text{lies}}$

Traditional metrics are not expanded and sound patterns are untouched, although the reader's knowledge of the complexity of physical sound is perhaps enlarged.

In both of the examples I have cited of combinations or prosodic and pre-prosodic systems, the lack of effective results is itself a result of unquestioning acceptance of full systems. The traditional foot system and its supplemental notes on sound both have deficiencies. The pre-prosodic systems extend into areas not practical for application to a printed poem, however justified they may be by observation of data and by theory. But that systems cannot be wedded "as is," does not prevent effective coupling of them in some degree.

It is proposed here that the pre-prosodic and the prosodic approaches can be combined by a selective joining of some compatible elements from each into a single system, and that the resultant union serves to refine and extend prosodic description. It is difficult to show examples of results before a demonstration of the complete system, but a few advantages of combining the approaches can be partially suggested in a limited format. For example, if one couples

phoneme-based transcription and phrasal unit with a thorough search for sound repetitions and intersections one can reveal sound structures which neither approach by itself will reveal. In the sample line,¹⁸ for example, the combined systems enable us to hear the balance between the two phrases, as neither system alone did:



Although the sets of details might be listed by a traditional metrist, it is exploration of them in relation to the juncture groups which reveals the structural function of the patterns. In the full system these structures are used as contributory forces for estimation of degrees of syllabic prominence.

In the system proposed here, a combination of findings from various pre-prosodic disciplines can join to show how syllabic *grades* of **stress** are created and these in turn can indicate the fundamental pre-prosodic rhythm of the line in graded, non-isometric relationships of medium, large, and small.

m	l	s	l	m	l	s	l
ful	fæ	ðəm	faiv	ðai	fdə	ðə	laiz

This basic pre-prosodic rhythm also points out that the line has balanced halves: (Traditional prosodic systems are limited to reducing m1 to s1 or l1.)

m1s1 - m1s1

All the elements which have been used to find the pre-prosodic rhythm, moreover, are available and practical for the literary scholar to apply.

Therefore, the system proposed here endeavors to incorporate virtues of both the prosodic and pre-prosodic approaches and to attempt a selective combination toward solution of the problem. From the prosodic, the general schemes of metrics, the syllable-count, syllable-stress, and strong-stress principles are, of course, taken into account as the most valuable metrical solutions, but the hope is that traditional metrics based in inherent language potential can be clarified so that metrical definition is made more precise and terms like "tension" explained, and that the pre-metric aids to traditional metrics can be extended by systematic and thorough application. From the pre-prosodic, those findings which the literary scholar can hope to employ with some confidence and a minimum of subjectivity are used.

The system, therefore, makes use of the phonemic principle insofar as it informs a broad phonetic transcription¹⁹ and of structural linguistics combined with the phoneme principle insofar as it provides findings on phonetic signals related to syllable,²⁰ phrase, and sentence boundaries.²¹ The system makes use of the results of acoustic

phonetic experiments insofar as they are informative on the broad characteristics of inherent phoneme quality²² and on speech sounds as they are perceived²³ and of various systems of grammar insofar as they can assist the locating of heads of phrases and potential phrasal breaks in a poem.²⁴ The system makes use of data on stress and pitch insofar as the data agree, whether the theories drawn from the data agree or not. That is, first, for example, acoustic phonetic experiments reveal no simple, single cue for stress but show a hierarchy of three parameters of stress perceived as pitch, duration, and loudness, with loudness as the least important.²⁵ Therefore, pitch and duration are here used as components of stress in discussions of metrics and in proposals for performance even though traditional metrics may by-pass them. Second, there is argument on the prosodies, the pitch levels and degrees of stress, and on their phonemic status,²⁶ but there are fairly consistent data on the usual position of main stress in the phrase and in the sentence, and on the presence of pitch movement at main sentence stress and at phrase and sentence ends.²⁷ The concept of terminal junctures and of the presence of only one primary accent between them as proposed in the Trager-Smith Outline²⁸ is accepted and used because it reflects agreement with phonetic data of both American and British studies of English although the findings are not always stated in the same terms,²⁹ but no attempt is made to employ the Trager-Smith pitch and stress phonemes in all degrees because agreement on them is not general and because no clear way of locating them is available when the study of sound moves from ordinary print into sound.

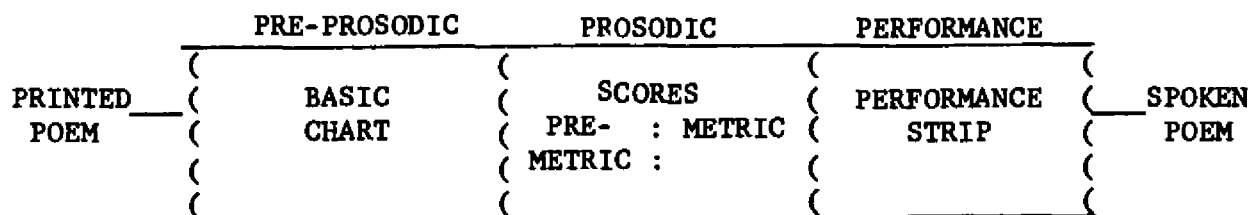
The presence in English of many phonetic degrees of stress is generally accepted, however, and the system provides a method of estimating the structural, phonetic, and lexical forces which contribute to grades of ~~stress and~~ prominence potential for every syllable in a poem.

A system is needed, moreover, not only to combine data, but to provide a form which is designed for a maximum of universality, a form which can accommodate poems of any stage of the English language and of any poetic style, and a form which can incorporate data in terms convenient for the literary scholar. In addition, the form needs to be such that any native reader of a poem can transcribe his analysis of the sound of that poem in the system and, in turn, understand any other reader's transcription. The system proposed here provides for these needs. It is not claimed that the bringing together of elements will produce a synthesis that will be a simple answer for the tonalities or rhythms of poetry, but it is proposed that the first reach toward better synthesis lies in a system structured with the aim of bringing connections to light through the principle of dissection.

It is further proposed that the way to the synthesis is a three-step system which separates the pre-prosodic elements from the prosodic and from performance particulars.³⁰ The first step is pre-prosodic, a thorough dissection of inherent sound elements. The second step is prosodic and is divided into a pre-metric section and a metric section. The pre-metric section consists of a thorough

dissection of sound repetitions and an evaluation of the prominences founded on the repetitions. The metric section is a search for the metrical patterns which best coincide with the pre-prosodic grades of stress adjusted by pre-metric weighting. The third step is the preparation of a guide for performance founded on both the pre-prosodic and prosodic steps. A system is needed which not only dissects and analyzes pre-prosodic structural elements and potential phonetic events but also charts these elements and events in a visual representation which serves to assist the recognition of sound repetition and metric patterns. The importance, however, is not in the means of visual annotation used, but in the orderly analysis which it both promotes and records.

The system, therefore, charts the three steps in detail and stretches the moment between sight and actual performance of a poem. How the principle of separation and dissection for the purpose of connection and synthesis operates in the system can be shown in a schematic representation of the system. The principle of separation is employed to divide the interval between print and sound into three major sections:



The principle of separation is further employed to divide each chart into two sections, printed matter and potential sound, both distributed

along a time axis so that the explored section becomes:

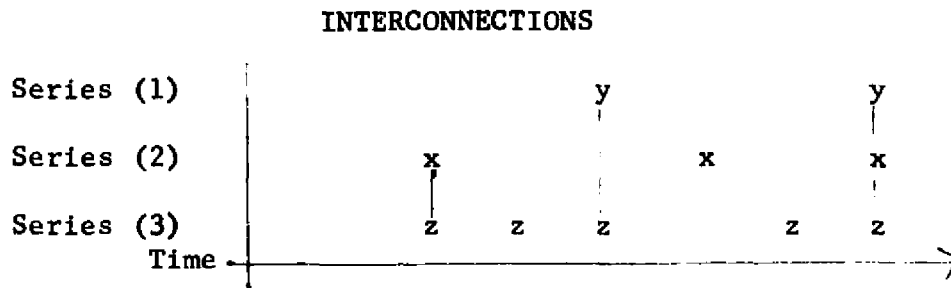
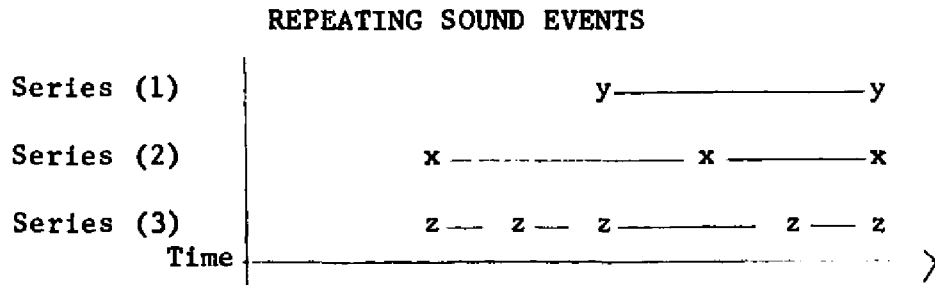
		PRE-PROSODIC BASIC CHART	PROSODIC SCORES PRE- : METRIC METRIC :	PERFORMANCE STRIP		
PRINTED POEM	Time	(Span of	(Patterns	(Choices among	SPOKEN	(
		(Sound	(of Sound	(Possible Sound		
		(Printed	(Printed	(Printed		
		(Poem	(Poem	(Poem		

Finally, each half of the first or Basic Chart is further dissected into layers of rows upon which sound and print units of various size can be plotted in relation to the central time axis. The dissection carries through until components are brought together in speech. The expanded core thus becomes:

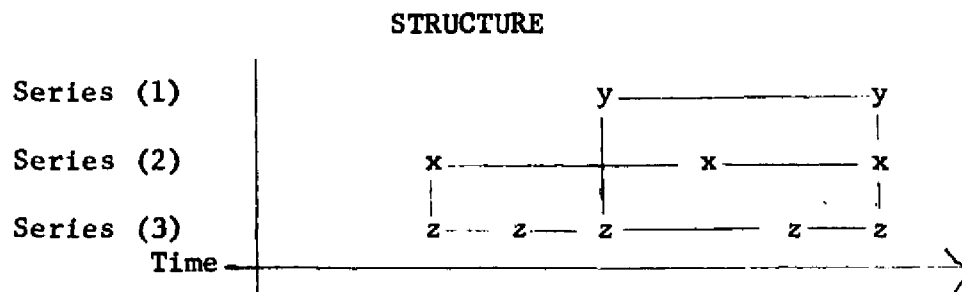
		PRE-PROSODIC BASIC CHART	PROSODIC SCORES PRE-METRIC: METRIC PATTERNS : SCORE	PERFORMANCE STRIP		
Possible Sound	Time	(Larger Units	(:	(SPOKEN POEM	(
		(Phrases	(:	(
		("Words"	(:	(
		("Syllables"	(:	(
PRINTED Poem	Time	(Phonemes	(:	(SPOKEN POEM	(
		(Letters	(:	(
		(Syllables	(:	(
		(Words	(:	(
		(Lines	(:	(
		(Larger Units	(:	(

The principle of synthesis is employed because the prosodic details are founded on the pre-prosodic, and the performance is founded on both. The principle of connection is employed because the Basic Chart and the Score are in graphic form in which speech events are mapped and which thus show the coincidences among the series of repetitions which build

into grades of stress, pause, duration and into pre-metric sound prominences. Series are recorded horizontally.



The collective framework of these patterns of repetition builds the points of phonetic noticeability which support metrics.



The interlocking sound structure is one of the unifying forces within a poem³¹ and every sound event in the poem therefore requires measurement in relation to the enclosing shape of the poem and to the other sound events within it. This system reveals the structure which

unites what has been separated for analysis, yet keeps visible the details which support that structure. Demonstration of the system is done mainly through two short selections chosen particularly because criticism finds in them two opposing styles from different centuries and traditions. They assist in showing the versatility of the proposed system because they provide a span of prosodic possibilities. They are, however, comparable in size; each contains one sentence and four lines. A Basic Chart for one selection, its mechanics and how to "read" it are all given in the next chapter.

Chapter I Footnotes

¹The term "pre-prosodic" indicates a linguistic approach to analysis. Edmund L. Epstein and Terence Hawkes use the term in Linguistics and English Prosody, Studies in Linguistics, Occasional Papers 7 (Buffalo, 1959), 14. They, however, restrict the term to the phonemic analysis of George L. Trager and Henry Lee Smith, Jr., An Outline of English Structure, Studies in Linguistics, Occasional Papers 3 (Norman, Okla., 1951). 7th reprinting by the American Council of Learned Societies (Washington, 1966).

²Strong-stress metrics are included in accentual systems.

³Isometric includes such musical foot systems as that of Sidney Lanier, The Science of English Verse (Boston, 1880), and such accentual metrics as Gerard Manley Hopkins's sprung rhythm as defined in the Author's Preface to Poems, ed. W. H. Gardner, 3rd ed. (London, 1948), p. 9.

⁴John Donne, "The Message," The Poems of John Donne, ed. Herbert J. C. Grierson (London, 1912), I, 43.

⁵The studies of David I. Masson extend and refine the analysis of patterns of sound repetitions and their functions. See "Vowel and Consonant Patterns in Poetry," and "Thematic Analysis of Sounds in Poetry," in Essays on the Language of Literature, ed. Seymour Chatman and Samuel R. Levin (Boston, 1967), pp. 3-18; 54-69, and "Sound and Poetry," in Encyclopedia of Poetry and Poetics, ed. Alex Preminger, Frank J. Warnke, and O. B. Hardison, Jr. (Princeton, 1965), pp. 784-790.

⁶Ralph K. Potter, George A. Kopp, and Harriet O. Green, Visible Speech (New York, 1947), pp. 123, 265. The example is sketched from Visible Speech and it therefore shows characteristics more definite than many spectrograms since their examples are all picked for their great clarity, and typicalness.

⁷Daniel Jones, An Outline of English Phonetics, 8th ed. (Cambridge, Eng., 1956). Phonemes used in the example are based on actual examples in the text.

⁸p. 43.

⁹Epstein and Hawkes use Trager-Smith transcription symbols for the suprasegmental phonemes.

¹⁰p. 46.

¹¹p. 14. The principle is advanced as a phonetic fact by Henry Lee Smith, Jr., in his introduction to their work, p. 7.

¹²This rule produces two weaks \cup , two tertiaries \backslash , two secondaries \wedge , and two primaries $/$, and since it specifies that the second is stronger it creates eight kinds of phonetic stress which are used in their prosody rather than only the Trager-Smith phonemic four.

¹³One of the fundamental concepts of the Trager-Smith system is that there is "one - AND ONLY ONE - primary stress," between terminal junctures (Outline, American Council of Learned Societies Reprint, p. 49). The primary stress, thus defined, can be put to use by the prosodist as a phonetic probability whether it is granted phonemic status or not.

¹⁴p. 21. They do, however, have misgivings and say "Pitch seems to be, in our terms, a consideration peripheral to the main issue, which is one of prosodic stress " (p. 17).

¹⁵pp. 36-41. Anapests and dactyls are to be subsumed by isometricism into iambic and trochaic feet or reduced to binary feet whenever some degree of stress tends to appear at both ends of a three-syllable foot.

¹⁶Henry Lee Smith, Jr., "Toward Redefining English Prosody," Studies in Linguistics, XIV (1959), 68.

¹⁷Seymour Chatman, A Theory of Meter (The Hague, 1965), p. 182. Shakespeare's entire sonnet "Shall I compare thee to a summer's day?" is given.

¹⁸Jones' phonemes are kept for the example but are not precisely those later used in the system of this thesis.

¹⁹As, for example, in the work of Daniel Jones or in a practical approach such as that of Claude Merton Wise, Applied Phonetics (Englewood Cliffs, N. J., 1957). Selected IPA symbols for a broad transcription are used in this thesis as the most universally known.

²⁰Definition of the syllable and its boundaries is an unresolved problem. A good summary of various kinds of definition is given by Chatman, A Theory of Meter, pp. 30-40. The most valuable approach for the analysis here is in phonotactic studies which examine the allowable occurrence of initials and finals and the allowable clusters of consonants. See, for example, Benjamin Lee Whorf, "Linguistics as an Exact Science," Language, Thought and Reality (New York, 1956), pp. 220-232; J. D. O'Connor and J. L. M. Trim, "Vowel, Consonant, and Syllable--A Phonological Definition," Word, IX (1953), 103-22;

Archibald A. Hill, Introduction to Linguistic Structure: From Sound to Sentence in English (New York, 1958), pp. 70-80.

²¹"Terminal juncture" (Trager-Smith Outline, pp. 46-50), for example, is a term from structural linguistics which conveniently covers the three long-recognized varieties of pitch behavior at phrase and sentence boundaries and marks a point of contact between stretches of syntax and stretches of sound.

²²Some basic studies of acoustic phonetics are: Ralph K. Potter, George A. Kopp, Harriet C. Green, Visible Speech (New York, 1947); Martin Joos, Acoustic Phonetics, Language Monograph No. 23 (Baltimore, 1948); Gunnar Fant, Acoustic Theory of Speech Production ('s Gravenhage, 1960); Peter Ladefoged, Elements of Acoustic Phonetics (Edinburgh, 1962); Peter B. Denes and Elliot N. Pinson, The Speech Chain: The Physics and Biology of Spoken Language (Baltimore, 1963).

²³Recent advances in phonetic instrumentation have made this an active field and some experiments concerned with the perception of natural and synthetic speech sound are informative for the prosodist. References in Chapter II and III and Bibliography list relevant articles. Herbert R. Moses, Jr. gives a brief and partial summary in Phonetics: History and Interpretation (Englewood Cliffs, N..J., 1964). pp. 97-111, 173-201. See also H. L. Barney and H. K. Dunn, "Speech Synthesis," Manual of Phonetics, ed. L. Kaiser (Amsterdam, 1957), pp. 202-212, for early Pattern Playback work at the Haskins Laboratories, New York.

²⁴Both standard and recent grammatical approaches contribute. H. A. Gleason, Jr., Linguistics and English Grammar (New York, 1965), pp. 497-507, gives an introductory comparative summary and a good annotated bibliography of key works, traditional, structural, and generative.

²⁵Dennis B. Fry, "Duration and Intensity as Physical Correlates of Linguistic Stress," Journal of the Acoustical Society of America, XXVII (1955), 765-768. Dwight L. Bolinger, "A Theory of Pitch Accent in English," Word, XIV (1958), 109-149.

²⁶Kenneth L. Pike states that only stress, pitch, and length "should be considered as suprasegmental phonemes," Phonemics: A Technique for Reducing Languages to Writing (Ann Arbor, 1947), p. 65, and the Trager-Smith system of suprasegmentals is generally followed, for example, by Hill in Introduction to Linguistic Structure, by Charles Frances Hockett in A Course in Modern Linguistics (New York, 1958), and, with modifications, by James Sledd in A Short Introduction to English Grammar (Chicago, 1959). Hans Kurath, an American structuralist in the Sapir-Bloomfield tradition, offers a phonology but states: "Pitch levels and degrees of stress serve to describe prosodic patterns, but in my opinion they are not 'phonemes' in any sense of the word," A Phonology and Prosody of Modern English (Ann Arbor, 1964). I accept Kurath's opinion on this point although I do not follow his particular phonemic transcription. The Prague linguists and generative grammarians do not include all the suprasegmentals as phonemes. For example, Noam Chomsky, Morris Halle, and Fred Lukoff accept the Trager-

Smith data but not the necessity for all four stress phonemes. See "On Accent and Juncture in English," For Roman Jakobson, ed. Morris Halle et al (The Hague, 1956), pp. 65-80.

²⁷There is little fundamental disagreement on such data, although various scholars use different terms to describe similar data. For example, in main stress and pitch movement Pike states that "falling intonation curves begin at the syllable which has heavy stress," The Intonation of American English (Ann Arbor, 1945), p. 117. Jones gives "normal tunes" in which pitch turns on the first stressed syllable and falls or rises sharply at the last stressed syllable of a sentence (§1021-5), An Outline of English Phonetics. Kurath, speaking of sentence stress, says, "Invariably accompanied by a pitch figure, this configuration of full stress and a pitch figure, called the sentence accent, signals the end of a segment of discourse."

A Phonology, p. 139.

²⁸see fn. 13, 21.

²⁹Jones does not use the concept of primary stress, but his evidence on stress in his normal tunes does not contradict it (An Outline of English Phonetics). Pike describes the presence of a main stress between breaks by describing the pre-contour pronounced in the same "burst," the contour which begins at it, and the pause which follows the contour. The Intonation of American English, pp. 30, 27, 32.

³⁰Separation is based on the linguistic position that abstract metric pattern is in the language of the verse line, and emerges from it under analysis. As Roman Jakobson states it, "The verse **design** is

embodies in verse instances," and "variation of verse instances within a given poem must be strictly distinguished from the variable delivery instances." "Closing Statement: Linguistics and Poetics," in Style in Language ed. Thomas A. Sebeok (New York, 1960), pp. 364, 365. See also Rulon S. Wells, "Comments to Part Five," in Sebeok, pp. 197-200; John Lotz, "Metric Typology," in Sebeok, pp. 135-148; W. K. Wimsatt, Jr. and Monroe C. Beardsley, "The Concept of Meter; An Exercise in Abstraction," PMLA, LXXIV (1959), 585-598; Roger Fowler, "Structural Metrics," in Essays on the Language of Literature, ed. Seymour Chatman and Samuel R. Levin (Boston, 1967), pp. 156-169; A. W. DeGroot "Phonetics in its Relation to Aesthetics," Manual of Phonetics, ed. L. Kaiser (Amsterdam, 1957), pp. 385-400.

³¹Samuel R. Levin, Linguistic Structures in Poetry (The Hague, 1964). Levin refers to the interlocking patterns of repetition in poetry as "couplings," which "function so as indeed to unify the texts in which they occur" (p. 1).

Chapter II

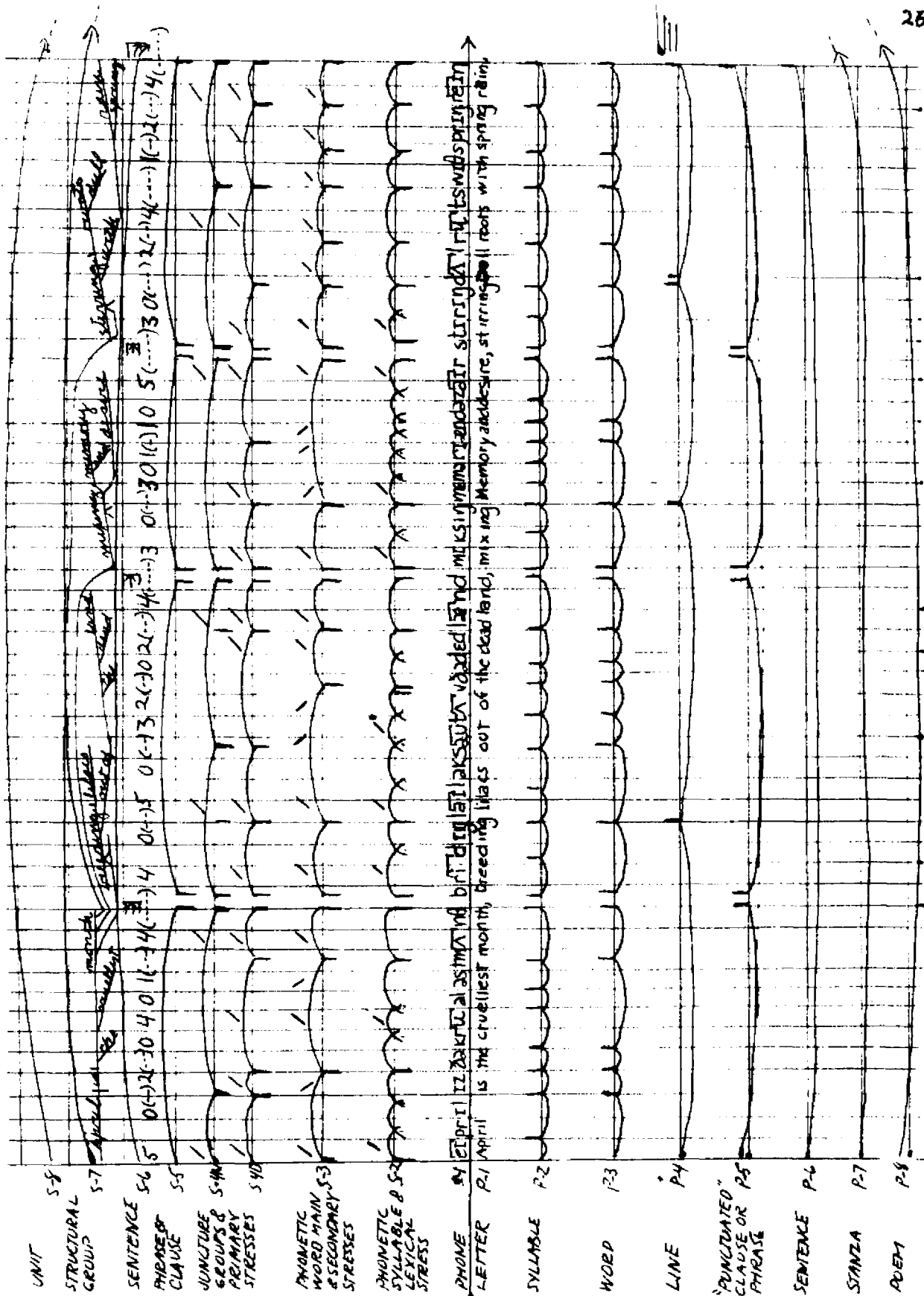
The Mechanics and Meaning of the Basic Chart

The first step, the pre-prosodic analysis of the sounds of a verse selection, consists of two parts. The first part is the dissection of the verse into units of all sizes. Each unit is analyzed as a separate domain for its inherent sound potential, and then, in the second part, these potentials are collected to provide the total pre-prosodic sound potential of the whole selection. The Basic Chart is structured to provide a framework for these two operations, each of which I shall discuss in turn.

Part I

Dissection

In the Basic Chart on the following page, the first four lines of T. S. Eliot's The Waste Land¹ are dissected. The hierarchy of rows is arranged to display speech sound units and print sound units in relation to a time axis which is the line at which change occurs from print to sound. The rows roughly mirror each other.

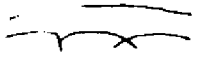


ELIOT BASIC CHART

* see p. 27

		Unit	_____
		Structure Groups	_____
		Sentences	_____
		Clauses	_____
	SOUND	Phrases normal tempo	_____
		Phrases slow tempo	_____
		Phonetic "words"	_____
		Phonetic "syllables"	_____
		Phonemes	_____
PRINTED		Time	
POEM		Letters	_____
		Syllables	_____
		Words	_____
		Lines	_____
	PRINT	Clauses	_____
		Sentences	_____
		Stanzas	_____
		Poem.....	_____

The Waste Land is used because the demonstration of pre-prosodic analysis of verse can be best shown at first by a sample in which metrics do not strongly obtrude. It is generally agreed that The Waste Land does not fall easily into ordinary syllable-stress metrics, and, therefore, the non-appearance of metrical markings in the pre-prosodic properties of the passage is not disturbing.

The structure of the Chart and some of the elements and oppositions they disclose are fairly clear on sight. It is easy to see at once that the phrase marks  indicate the lengths of units of sound and that sharp points between phrases show potential breaks whereas crossed ends represent places where separation in the sound continuum is not clearly marked.

The eight horizontal rows below the time axis are designated as print or P-rows and show the visual units from the smallest, the letters and the punctuation, through ranges of increasing size to syntactic stretches and on to structural groups, the stanza and the poem. Stanza and poem are, in this case, larger than the selection shown, as the arrows and dashes indicate. The only element of the printed poem which is lost in this framework is the two dimensional pattern of the arrangement and spacing of lines upon the original page. However, indentations, vertical spreading by extra inter-linear spacing, or any arrangement into a "shaped" poem such as George Herbert's "Easter Wings" or Dylan Thomas' "Vision and Prayer," with its series of squares turned point uppermost, do affect the sound by influencing pitch sustention or pause at line ends, and therefore the shape is reclaimed from the page for the memory by the little diagram at the end of the line, or P-4 row. The rows above the time axis are designated as the sound or S-rows and provide levels on which the lengths of eight kinds of sound units are represented, from the smallest, phonemes and pauses, through the ranges of increasing size with their discreteness or ambiguous join to adjacent members, and on to the larger syntactic and structural groups.

It is easy to see, also, some of the vertical relations between rows, such as that stresses and potential breaks heap up at some points and that blank alleys show major potential silence, but it is also evident that the inner sound rows are a blurred mirror of the print rows. Discreteness on the printed page is not always reflected in the sound; syntax and line can be offset in enjambment as at Rows P-5, P-4, respectively.

and a vertical check at any point shows the details of the difference between sound and print at that point as well as conflicts between breaking and joinings.

It is clear, furthermore, that indicating the phrase marks for the print rows is a fairly simple matter. All the print units are already visible in ordinary print except, of course, the syllable and sometimes the clause, but rules of custom for the first and grammar for the second make specification a small problem.

Not immediately clear, however, is the basis on which sound units are specified, the meaning of their interrelationships, and the use to which they can be put. Perhaps, too, it is not evident that once criteria for units are known a Basic Chart can be sketched out fairly rapidly. Meaning and use are discussed in the second part of the chapter and the preparation of a Chart is clarified in the first as the controls which govern the Chart are taken up row by row.

There are three general premises on which sound is dissected and entered on the Basic Chart. The first is that the distribution of sound into time is represented by the relation of the row of smallest units to the time axis. These basic units of Row S-1 measure off one space each on the time axis and are the consonants, short vowels, and short pauses. With a few modifications, long vowels, diphthongs, and major pause measure two units. The fact, however, that the English syllable is actually elastic and is not the sum of arbitrary durations is provided for in an adjustment discussed in connection with stress in Chapter III. The second premise is that each sound unit for Rows 3,

4D, and 4N, once its length has been established by means of the controls for its row, is considered for its probable stresses when spoken as an isolated unit without either increased stress or stress moved for special emphasis or emotive gradients. The third is that inherent phonetic stresses are of varying degrees. These varying inherent phonetic stresses are not here held equivalent to the four phonemic levels as proposed in the Trager-Smith Outline.² There are more shades of inherent or potential stress than four and no way of reducing them to the four supposedly phonemic degrees is suggested here.

The preparation of the Chart begins with the row of phonetic symbols, Row S-1, for it is here that the first distribution of sounds and silences into time occurs through the distribution on the x axis of the symbols of a broad and essentially phonemic transcription to represent the first stage toward the act of speech. It is this distribution which makes the x axis final for the Basic Chart, although the axis will be variable and elastic within limits in metrics and for performance. Once transcription symbols are established the assignment of time values to them can be undertaken.

The transcription symbols used on Row S-1 cannot be, with any severity, termed phonemes. Unfortunately the identity of the phonemes of English is still argued.³ Various listings, and, indeed, the definition of the phoneme itself rouse opposition even among those who strongly assert and defend the phoneme principle, the principle itself has been attacked, and the precise relation of phonemics to phonetics

remains unsettled.⁴ The direction of study for the practical phonemicist is, moreover, a movement from the raw data of spoken sound towards the establishment of phonemes, for, as Pike says, "the purpose of practical phonemics is to reduce the language to writing."⁵ But the direction of study for the literary analyst, who sits alone at his desk, is the reverse. He is constrained to move from the printed page through a phonemic grid towards actual sound. It is probable that he cannot estimate the exact shape and placement of that grid, but he can let its general shape influence his steps. That is, he probably cannot find a location in the arguments on phonemes where he is certain his position is both fully consistent within itself and precise. It is best, then, since the analysis must move toward sound, that the transcription be undertaken in broad phonetic terms which are sufficient for his purpose, which have the virtue of incorporating the practical results of various linguistic schools, and which have the added convenience that they employ the International Phonetic Alphabet and permit convenient later movement into narrow phonetic range for some particular performance detail.⁶

This step towards sound is therefore both phonetic and phonemic, and it can be indicated in a transcription with more latitude than either a rigidly phonemic or rigidly phonetic approach could employ, because its purpose is to indicate a broad span of reasonable possibilities. The transcription is phonetically based in that the analyst tests possibilities in sound at least by projecting them onto his own

speech and listening to his own samples, and it is phonemically based, in a rough way, because he is not yet listening for distinctions of sound which do not alter the meaning of his spoken sample, but only for those which do (within, of course, here, standard cultured American English). Furthermore, where two sounds seem equally possible, he can enter both as alternate possibilities at that point in the transcription. A practical transcription leading towards eventual realization in speech need not be, as Claude Merton Wise suggests, "cumbersomely phonetic or starkly phonemic,"⁷ but here it is as close to the phonemic as it is possible to come with IPA symbols. The row is loosely called the "phoneme" row although "phone" might be more precise since there is no convenient word which clearly indicates a broad rather than a narrow transcription symbol.

Appropriate narrow phonetic modifications belong on the performance chart where a final placement (for that particular chart) of a stress may influence vowel color and where dialect influence such as a Scotch or Irish flavor or a historical phase of English such as Elizabethan English (insofar as it is known) may shift some vowels and *some* details of consonant articulation.

Lists of the IPA symbols and broad transcription sets for English are available and resemble each other sufficiently so that a transcription by one analyst is readily understood by another. A convenient list is in Wise's Applied Phonetics.⁸ The list used here resembles his, except that inverted w [ʍ] is not included and [a], [ɑ], and [ɒ] are merged to [a]

to represent all three since there is great variation among the various regional pronunciations of low, lax, unround "ah" as used in father, calm, hot, watch, barn,⁹ and since here the concern is not to show regional differences and precise vowel quality, but to represent by one symbol those vowels likely to be pronounced the same by one reader.¹⁰

The following symbols for transcription are used in this dissertation. There are fifteen consonants used as they are used in the printed alphabet.

[b, d, f, h, k, l, m, n, p, r, t, v, w, z.]

Three are alphabet symbols but are not used precisely as in the printed alphabet.

[s] is always the [s] of rice, not the [z] of rise

[g] is always a stop as in good, go

[j] is used instead of alphabet y, as in yo, yaw

Seven consonants are phonetic symbols.

[θ] thing, thought

[ð] this, that, they

[ʃ] ship, shy

[ʒ] rouge, loge

[ŋ] ring, slang

[dʒ] John, juel

[tʃ] chain, chew

The front vowels are:

- [i] seed, feet, peat, peel, pier
- [I] sit, bid, pit, pill, bier
- [e] vacation (not in syllables with the main lexical stress)
- [ɛ] set, bet, pet, sell, bear
- [æ] vat, cat, pat, cad, pal

‡

The back vowels are:

- [ɑ] father, palm, hot
- [ɔ] hall, bore, Paul, caught
- [o] notation (not in syllables with the main lexical stress)
- [U] book, boor, foot, nut
- [u] boot, pool

The center vowels are in stressed syllables

- [ʌ] up, but
- [ɜ] fur (the same with r coloring)

in unstressed syllables

- [ə] about, soda
- [ɚ] schwa with an r color

The "schwa" is the form which most full vowels take in unstressed syllables. Some reductions of [i] as in party seem to reduce to some sound within the [I] span. If decision is difficult for the Basic Chart, the principle of span suggests that both be indicated.

The diphthongs are:

[eɪ] the ay sound in stressed syllables as in bay, bait

[aɪ] bite, by, kite

[oʊ] though, boat, the oh sound in stressed syllables

[ɔɪ] boy, soil

[aʊ] thou, howl, owl, mouse

The transcription has to be in the main variety of English which the transcriber speaks, since he can only transcribe in terms of his own knowledge. Therefore, for British transcription the r-colored symbols would not be needed, and the diphthong [əɪ] might be.

The main areas of disagreement both in phonemics and phonetics are on the disposition of the vowel nuclei into simple or complex diphthongal units, and on the related argument on the disposition of the second and less dominant half of the diphthongs either into vowels [ɪ], [ʊ], and [ə], or into glides, [j], [w], and [h].¹¹ Broad phonetic solutions in general veer to providing diphthongs for [e] or [ɛ], [o], and [a] by adding a final vocalic element, but retain [i] and [u] as simple nuclei. The Trager-Smith phonemic system, however, for example, provides /i/ and /u/ as phonemes,¹² but phoneme /i/ includes among its allophones one like phonetic [ɪ] in pit, and it also functions as the first member of a diphthong written /iy/ for phonetic [i] in bee, and phoneme /u/ includes among its allophones one like the phonetic [ʊ] in put, and it also functions as the first member of a diphthong, written /uw/ like the phonetic [u] in do.

The system used here is a compromise which permits the use of IPA symbols yet accounts for all the phonemic situations except for possible diphthongization of [i] and [u]. The possible occurrence of such diphthongs, insofar as it is relevant for the Basic Chart, is provided for in the system used here, nevertheless, by the way in which duration is to be assigned to the various vowels (shown later). Furthermore, whether the second element is designated as [I] and [U] or [j] and [w] is immaterial in this system as long as space on the time axis is provided for the second element. And, finally, adopting the convention that simple [e] and [o] do not appear in syllables of primary or secondary stress but are there diphthongized to [eI] and [oU]¹³ provides for the duration distinction needed in this system between simple and complex nuclei.

The question of how the list of symbols is to be distributed into time along the x axis does not unfortunately resolve itself into any simple allotments in terms of hundredths of seconds to each on the basis of acoustic phonetic evidence, but the evidence available from many spectrographic experiments has at least created a general agreement that a few duration relationships constantly appear. Certain long vowels, short vowels, and diphthongs usually dure longer than most consonants. A voiced consonant slightly lengthens the preceding vowel more than a voiceless consonant does, and "syllabic" consonants such as m or n in rhythm or button dure longer than their consonantal form. At best, these are grossly simple statements about a complex situation. Vowel and consonant separation is not simple. In actual sound there is an

"overlapping" of the consonant and vowel which makes a statement about "edges" a convention of the code rather than a result of measuring discrete entities. For example, if spectrograms are made of recordings of the words mama and nana, a cutting, interchange, and splicing of their parts reveal that what appear to be (and are) the vowels yet contain some sound cue which identifies the original consonant.¹⁴

The assignment, therefore, of any quantitative durations to discrete phonetic symbols can only be a convention, since the sounds themselves are not truly discrete. Yet within the terms of such a convention measurements have been made of the durations of the sounds of speech by spectrograph, and the relative spans of several classes of speech sounds are sufficiently recognized to be crudely translatable into a few relative lengths upon this system's axis, although, it is understood, the lengths are subject to some alteration for any particular performance and the representation in the Basic Chart is only an indication of the most usual hierarchy of durations.

Durations of the sounds can be roughly sorted into a few classes. On the ready evidence of numerous spectrograms, it is generally agreed that consonants are usually shorter than many vowels and even the combinations [dʒ] and [tʃ] are quickly articulated and do not double the time of other consonants. The plosive voiceless stops [p], [t], [k] are seldom extended since they are an interruptive silence in the main stream of sound followed by a very slight and short burst as the breath is released, but, of course, all the continuants, fricatives, nasals can be extended and some consonants extend even into the following vowel.¹⁵

It is not inconsistent with these general conditions to make consonants the fundamental unit along the time axis and assign them one unit apiece.

The vowels and diphthongs present more of a problem and their durations have been the subject of a number of studies. A few characteristics have been shown which are perhaps broad enough to represent in the crude scale possible in the Basic Chart. The sum of the results shows [ɪ, ɛ, ə, U, ʊ] the shortest, all the diphthongs the longest, and the remaining vowels "long," [i, æ, a, ɔ, u, ʌ], with [æ, ə, ɔ] perhaps longer than [i] and [u],¹⁶ and vowels followed by voiced consonants longer than those followed by voiceless as in bid and bit.¹⁷ But vowels are not only different in inherent duration but that duration is one of the identifying signals in vowel perception¹⁸ and is therefore not to be discounted in the temporal analysis for the distribution on Row S-1.

In my system the variation between the [ɪ] in bit and in bid is too minute to be represented on the scale, but that unstressed vowels are shorter than stressed is automatically recorded in the transcription because either [ɪ] or [ə] is used, as in [mɛmərɪ] "memory" in the Eliot chart, and [ɪ, ɛ, ə, U, ʌ, ʊ] can be assigned one unit along with the consonants as can the few unreduced vowels in secondary syllables such as the [o] and [e] of notation and vacation.

The diphthongs are in general longer than the remaining long vowels, but not exclusively so. Yet the only way to give representation in the chart scale is to give two units to both diphthongs and the long

vowels [ʌ, æ, a, ʊ, i, u, ɜ̃]. The ratio is a falsification but at least keeps in focus the fact that the sounds are extending into time in varying degree. Therefore, in the Eliot chart, for example, the A of "April" is given two units [eIprIl], as is the ee of "breeding" [brɪdIŋ], or the u of "cruel" [kruəl]. It would be informative if a separation could be made into three or four instead of two gross sets, but it is hardly practical to introduce half units and it seems preferable to accept the exaggeration of the one to two ratio rather than to try to chart half-units. However, if more detailed study of a limited area is desired, it is always possible to increase the overall time scale and assign a few finer distinctions in accordance with data on which there is general agreement from recent and various acoustic phonetic experiments. Indeed it is possible, of course, to extend the scale of the Basic Chart to that of the spectrogram and, if any spectrograms are available for readings of the poem under study, to enter relevant duration data into the Basic Chart as a check or guide, though not as a final control. Spectrograms can be "read" fairly easily, but making any but gross measurements from them involves problems of segmenting the continuum which demand sophistication in acoustic phonetics.

The two-way distinction here used for duration of the sound symbols, although it is far from ideal, does at least serve to force recognition that inherent duration differences do exist, so that there is some evidence which can be employed in proposed quantitative theories in the Score. These inherent durations echo the classic

distinctions among long and short vowels and diphthongs and, to some degree, may echo the classic lengthening of a vowel by position before clusters, since voiced clusters are known to lengthen it.

The research so far available to the literary scholar does not give much that he can yet put to use with any precision beyond some tentative differences in nuclei, but it does indicate that in the future some useful agreements may come out of research. Further acoustic study of the inherent durations of the fundamental speech sounds may make it possible to sort them into several groups of sounds of various durations with rules for change under environmental influence. Further acoustic study may isolate for each language those meaningful duration distinctions which are conditioned by learning to speak that particular language and which are therefore a part of that language.¹⁹ All this study will not be without value for analysis of rhythms in poetry. At present it is a long gap from the data on micro-details of small sound units in individual utterances to the general sums of their interrelationships in syllables and in the complex of what is called stress, but as studies continue, it is possible that the gap may be bridged.

The question of how punctuation or any indications of possible pause suggested by the text are to be represented by duration distribution into time on the x axis also needs some transcription convention. Pauses vary in length. In line with the principle of this system in which elements are divided into components for study and in which components are assigned to the various rows, different degrees of pause

and the locations of potential pauses are indicated on various rows. Clearly any provision for major pause needs indication in Row S-1 which controls the fundamental time distributions, while lesser or optional pauses are either too short in duration or too problematic to require unit measures.

The degree of variation of pause in casual speech extends from the long hesitations which can occur anywhere while the speaker gropes for his thought, or the expression of it, to the absence of pause which can occur when the speaker hastens over boundaries in order to forestall interruption. Neither of these extremes is likely to occur in the reading of poetry, where the words are given and the listener is apt to wait for a final signal, not only of silence but of some gesture or facial expression. Thus the major pauses can be expected to fall within a moderate range and, therefore, where punctuation suggests final or sentence boundaries or where it sets off internal sections, or where analysis of syntax suggests that such a boundary should have been indicated in the text, some moderate units of time can be allotted on the x axis.

The kinds of boundaries in speech which can or need to be marked in sound fall into two groups: first, that consisting of the potential breaks which can, but do not need to be made between words or between short groups of words in slow speech, or between longer groups in faster speech, and second, that consisting of the boundaries which are needed to prevent ambiguity and to signal sections of utterances and finals. The first group of boundaries, the potential,

is indicated in the Basic Chart in various rows. Wherever phrase marks dip to a clear point, potential break for the size unit of that row is indicated. In the eventual "reading" of the Chart the various breaks and joins are summed vertically. On Row S-1 no minimal potential breaks are indicated among the symbols which lie between major punctuation (punctuation printed or proposed on syntactical grounds), because these potential breaks can be better distributed in conjunction with the appropriate size units of the various rows, and the possible separations between syllables, words, and phrases will be discussed in the sections dealing with Rows S-2, 3, and 4. The continuum characteristic of speech sound is therefore represented by writing the symbols without spaces.²⁰

The second kind of boundary consists of the breaks necessary to prevent ambiguity or confusion and to signal ends of phonetic units. The omission of this kind of boundary changes meaning because it conceals or alters underlying structure. The smallest is the kind that separates a name from an aim²¹ and is indicated on Rows S-2 and S-3 and discussed in conjunction with S-2. Whatever pause or phonetic signal it involves is too small to demand an allotment of time on the phoneme row. The other junctures which mark boundaries are called terminal junctures and have been found to be signaled by pitch sustention, fall, or rise, and by extension of the durations of the syllables they close. Silence or pause can and often does follow them. Those terminals necessary to prevent confusion are usually

signaled in print by punctuation, and the pause which follows needs representation on the time axis and on the phoneme row which controls it in the Basic Chart. These juncture phenomena, therefore, need examination. In structural linguistics these junctures have phonemic status. Their function is to delimit and define syntactic units by the phonetic signals of pitch rise, fall, or sustention²² and of the lengthening of the sounds preceding juncture. Here, however, the step must be taken from the text to sound, with a detour through syntax, and the presence or absence of potential phonetic breaks must be projected.²³ According to the principle of dissection, the components of these junctures and the pause which can follow them or the time into which they can extend are distributed on various rows. The major syntactic groups signalled by punctuation in the text are accepted as signalling a major break and on Row S-1 one unit of time is assigned to transitional marks and two are assigned to finals. In performance the time can be consumed either by the extension of a final syllable or pause. Here it is only necessary to leave the space for either. In sound the sustention juncture /→/ can signal major syntactic break. On the page the comma can signal such break, as for example in the Eliot Chart where a unit is left open after "month," "land," and "desire," but in sound the sustention juncture /→/ can signal minor syntactic break which is not shown in the printed poem but is indicated on Rows S-4D and S-4N as potential juncture by marking points of potential minor break. The detailed components of /→/

involve pitch sustention, slight duration extension, and possible fade in loudness. In the Basic Chart what little can be shown concerning basic pitch movement is indicated above Row S-5 in the form of fragments of a DPL strip which is described in Chapter III, and which can be seen in the Eliot Chart as little insignia above S-5.

The distribution into time of the sounds on Row S-1 depends on which sound and its symbol are chosen in transcription, and these in turn depend on the reader's own variety of English and on the presence or absence of stress, but the transcription is broad enough to absorb many of the regional variations and only the effect of lexical stress need be considered. "Sense" stress is indicated on S-4D and S-4N and "metrical" stress, another matter entirely, is considered in the Score. The broadness of the transcription as already noted uses [a] to represent the various shades of [a], [ɑ] and [ɒ] because they show regional variation in English and are, actually, one way of distinguishing the speech of various regions.



It is accepted that in English there is a strong tendency to reduce the quality of unstressed vowels toward [ə] or [ɪ] or sometimes if followed by final [r] to [ɚ]. Lexical stress is a guide to reduction in polysyllables, and in general, syllables that do not carry it may have the vowels reduced as in the first syllable of "desire," [dɪzəɪr], or the last of "lilacs," [lɑɪlɔks]. Secondary lexical stress does not always carry reduction all the way to schwa but may retain the color of an [e] or [o] as noted in vacation and notation. Sometimes, then, secondary syllables can contain a long

vowel, as in, for example, repository, where the o in -tory can keep its [ɔ] flavor. In these cases long vowels or diphthongs can be reduced from their allotted two units to one. In transcription for the Basic Chart monosyllables can be given their full color and length, since the transcription is designed to represent the possible span of sound. In any guide for a particular performance the few reductions created by a selected metric pattern can be entered and any over-pedantic flavor can consequently be subdued. A few exceptions can be incorporated from the beginning, however. The vowels in the and a, unless they are in capitals or italicized in the text or are singled out by some isolation in the line arrangements for special emphasis can reduce to schwa. There are a very few common short monosyllables which contain "long" vowels for which reduction of duration to a single unit is likely. An, and, and as can have a one-unit [æ].

A summary of the controls of Row S-1 is based on three principles: the phonemic selection of the appropriate and obvious transcription symbol which will not change the meaning ([reɪn] not [raɪn] or [rɛn] or [beɪn]); the known position of the primary lexical stress and also sometimes of the secondary; and the tendency of English vowels to be reduced in unstressed syllables. The list which controls S-1 and therefore the time axis is:

established all the printed units are distributed on their appropriate rows in alignment with the positions dictated by the transcription. The lengths of units, thus under control of sound and of the time axis, reveal different relationships than appear in print. "April" becomes as long as "breeding," "roots" and "rain" are equalized, "dead" becomes as short as "out." Although these relationships are tentative, they force the scholar to reacquaint himself with sound and its possible span in time.

The next row is the phonetic "syllable" row, S-2, which differs as much from the printed syllable as the transcription symbols do from the letters. The conventions for the printed syllables, although they do not show in the printed poem are in the dictionary. The divisions are sometimes arbitrary and usually are not recoverable from the sound continuum. Yet we generally feel we can recognize the syllable and put it to use in metrics,²⁵ a process that sometimes "destroys" or "creates" syllables by compression through elision or extension by breaking diphthongs as, for example, breaking hour [aUr] into [aUʒ], or even tide [taId] into [taIəd] or perhaps [taIjad] . For Row S-2, however, such distortions, unless clearly indicated, can be reserved for the support of theories in the Score or renderings in performance. For instance, if hour rhymes with tower that is a sufficiently clear indication that it can be stretched in the Basic Chart.

When the division between two syllables, either in one word or between two words, cannot be discovered, the uncertainty is indicated in the Chart by an x in the phrase ends, . That an apron was once a napron²⁶ shows the uncertainty of the inclination of a single consonant between vowels. There is no way in sound to tell where, or if, there is a separation unless an ambiguity threatens, and the speaker takes pains to indicate the potential separation in his speech. Ordinarily he does not need to differentiate, and spoken syllables and words run together. On the Basic Chart any such ambiguity can be clarified by showing definite division, , but in the Eliot there are no confusions of this kind.²⁷

When terminal pauses or clarification of an ambiguity do not mark separation in the sound continuum there is no finally settled criterion by which it can be specified that a consonant (except *h, ɣ, ʒ*)²⁸ between vowel nuclei "belongs to" one or the other, and therefore single consonants are marked to show that division is potential either before or after them.²⁹ For example, in the Eliot no cause forces sharp division within "breeding," and either "bree-ding" or "breed-ing" is a possible theoretical division of that which is not actually divided. Therefore an x in the phrase ends is marked over the d. There is a potential both to connect or to disconnect between the words "April is" and an x is marked over the l [*eIprIlIz*]. Where double consonants occur in print, they are usually spoken and transcribed as a single sound marked with x as in "stirring" or in "and desire" [*stIriŋ*] and [*ɹndəzəIr*].

When a cluster of consonants lies between vowel nuclei, and no major pause or clarification of ambiguity forces separation, the status of the cluster as a final or initial cluster in English, or as a group which can break into a combination of final and initial, determines the possible point of clear division³⁰ or the particular sound about which uncertainty is centered.³¹ A small chart demonstrates.

For example for [zð]:

	used as FINAL		used as INITIAL
[Izðə]	(((
"is the"	([-zð]..... no	(-----	(
	(-----	([zð-] no	(
	(((
	([-z] yes	([ð-] yes	(
	(((

There is only one possible break, between the [z] and the [ð], and in the next example there is also one possible clear break in the cluster [stm]:

	used as FINAL		used as INITIAL
[kruɔlɔstmʌnθ]	(((
"cruellest month"	([-stm] ... no	(-----	(
	(-----	([stm-] no	(
	(((
	([-s] yes	([tm-] no	(
	(((
	([-st] ... yes	([m-] yes	(
	(((

There is a clear possibility for break between [st] and [m], but breaks are not always clear. In [ks] one sound can have two functions:

	used as FINAL		used as INITIAL
[lɪlɪksaʊt]	(((
"lilacs out"	([-ks].....yes	(-----	(
	(-----	([ks-] no	(
	(((
	([-k] yes	([s-] yes	(
	(((

Since [s] can work in two possible situations its attachment is uncertain and an x is marked over it on the S-2 Row, because a break could come either before or after it. The break could be around the first of two, as in [pr]:

	used as FINAL		used as INITIAL
[eIprIl]	(((
"April"	([-pr] no	(-----	(
	(((
	(-----	([pr-] yes	(
	(((
	([-p]yes	([r-] yes	(
	((((

Since [p] can work in two ways, it is the uncertain member. It is possible, of course, to have the whole cluster uncertain, as in [st]:

	used as FINAL		used as INITIAL
[st]	(((
	([-st]yes	(-----	(
	(((
	(-----	([st-] yes	(
	(((
	([-s] yes	([t-] yes	(
	(((

It is true, of course, that the redundancy of signals in language clarifies these uncertainties in due course, and that grammatical, lexical, and structural clues help the listener decode the continuum, but in the Basic Chart each event, each unit, is under its own mastership insofar as is possible, and thus the uncertainties are noted. There are interrelationships, of course, which will eventually come to light. The stresses, row by row, build to totals which will effect durations and metrics. Row S-3, where the "phonetic word," is registered will have one control dependent on the S-2 Row. Therefore,

it is important to note that when the consonant clusters between nuclei consist of three or more consonants and when there is no single clear break indicated by initial and final cluster criteria, it then becomes doubtful whether the connecting force of the continuum is as strong as it is when the clusters are short. Furthermore, larger groups of consonants are more difficult to articulate than small.³² For example, the group [θspr] is not easy to connect.

	used as FINAL		used as INITIAL
[θspr]	(((
"with spring"	([-θspr] no	(-----	(
	(-----	([θspr-] no	(
	([-θsp] no	([r-] yes	(
	([-θs] yes	([pr-] yes	(
	([-θ] yes	([spr-] yes	(
	(((

The basic uncertainty centers in the s, but for large groups the phonetic force to join can be considered inadequate and the cluster can be divided at word edge. It is generally agreed that initial clusters take precedence over finals,³³

There are lists available of the possible combinations that constitute initial and final clusters in English,³⁴ but the literary scholar's usual knowledge of the language lexicon is sufficient to make most syllable marking easy for him, except that he will have to resist his etymological knowledge in favor of his ear. The marking serves the purpose, too, of forcing more attention on what could or

could not reasonably happen to the syllable principle in actual sound, and the marking of the separations and ambiguities discloses that rhythms are affected by the tendencies in speech sound which create either run-together stretches or passages of discrete elements.

Stresses are marked throughout the Basic Chart in conjunction with each size of unit. The main lexical accents of polysyllables are marked on the S-2 Row because they are associated with particular syllables. These known stresses are marked on the S-2 Row or sound-of-syllable row. For the time being, a simple mark serves to show that the phenomenon of stress (whatever its components may be in general or particular) does exist and is recognized as connected with certain syllables in words of two or more syllables. This main lexical stress is usually known by the native speaker's knowledge of the language or by reference to a dictionary, and the accent marks on S-2 show where it usually occurs. There is one variety of what really is lexical stress which is not always clearly recognized, because it involves two words generally printed as separate but spoken with a custom-fixed accent as a combination, such as a few compound prepositions which are fore-stressed. In the Eliot, for example, "out of" is such a combination and is generally stressed as "out^{/'} of."³⁵ It has to be borne in mind that all lexical stress is only potential. Were it omitted and "April is the cruellest month" spoken with syllables as even in pitch, duration, and loudness as possible, so that no cue to stress appeared of which the speaker was aware (and he could not really do it), the phrase would still be understood and the

rendition, though it would be considered flat, would not seem foreign or substandard or doltish, except perhaps for the "el" in "cruellest." It can be seen, then, that lexical stress can often be reduced without producing shock to the listener, whereas bringing up some unstressed unit might make that unit suddenly seem "prominent" or, in other words, somehow stressed. It is therefore suggested here as a general rule that whatever the stress complex is, reduction of a normal lexical accent to an unstressed level is more ordinarily tolerable than increase of normal unstress to stressed level. That is, the raising of a lexically unstressed syllable to the general level causes an odd effect, and raising it above the general level causes attention-marking emphasis. Even words which are phonemically differentiated by stress, such as abstráct and ábstract, verb and noun, can usually suffer reduction of lexical stress because surrounding syntax shows in which set they are functioning. Only if there is ambiguity does lexical stress need to be present.

The controls of Row S-2 are based on two principles: that the position of lexical stress is known or ascertainable; and that forces of potential connection and disconnection create uncertainties in syllabic division, but the division can be located because the sets of initial and final consonants and consonant clusters have been analyzed for the syllables and words of the language. The list which controls unit lengths and borders and accents on Row S-2 is:

Syllabic division is ambiguous where there is

no intermediate consonant,

only one intermediate consonant (except [h], [ŋ], or [ʒ]),

any member or members of a cluster which can function

in two or more divisions with the remaining members.

Syllabic division is clear where there is

an intermediate cluster which can function only one way,

a major pause,

a /+/ juncture to remove an ambiguity.

Main lexical stress is known and indicated.

The next Row, S-3, is the "word" row in sound. This row is controlled by the speaker's knowledge of the lexicon and can be easily marked on the principle that uncertainties of internal syllable division can be dropped as not relevant here, but inter-word uncertainties retained. Where a word border coincides with a clear syllable division, it marks off units and creates what are defined here as "phonetic words," some of which are the same as printed words and some of which are combinations, such as "Aprilis," "thecruellest," "lilacsoutof," "thedead."

Every one of these groups of sound, these phonetic words, when spoken as an isolated unit for sense has one syllable which carries the main accent of the group marked and is marked (/). If there is only one syllable in the group, it has, for that group, the main accent and is marked (/). Whenever there are more syllables, there

may be several secondary accents which can be marked (\). For example, accents could be "Április," "thecruéellest," "lílacsoutof," "thedeáad."

Some phonemic marking of accents, such as the Trager-Smith system, employ four degrees of stress, and it is perhaps possible to isolate and mark four degrees when a particular set of sounds is listened to, but when possible sound is being projected out of the silence of the page, it is very difficult to apportion as many as four degrees with any precision. Therefore, the forces which cause the various grades of stress are distributed on the rows that bear them. On this row it is possible at least to mark three phonetic grades, main, secondary, and weak or unstressed, with some hope of reasonable accuracy when the distinction is between the most important stress and a secondary or several unranked secondaries. Since the eventual value of a stress marked on Row S-3 is only one unit of five which sum into stress potential, decisions of stress on Row S-2 are balanced by the weight of decisions on other rows.

Just as stresses or lack of stresses balance with or against those on Row S-3, so other rows may later contradict division or separations of this row, but a span of potential is what is being made, not, of course, an "accusation" that speakers run everything possible together although in fact they often do. The units on this row are not synonymous with certain structural linguistic units. They are units of the system used here and are not, for example, equal to Trager and Smith's "morphemic word," which consists of

"a single base [a root], its accompanying suffixes [if any], and a superfix [stress and plus junctures]."36 The controls of Row S-3 are simple.

1. Phonetic words are divided where syllable division between them is clear and occurs at lexical word boundaries or where a loop indicates "weak" joining.
2. The main stress and any secondary stresses are marked for each created phonetic "word."

Each row, as has been shown by its summary of controlling criteria, is as much as possible a domain of its own and a level at which one of the sets of forces working within speech is given expression. Row S-1 is related to local tone quality, the individual quality of vowels and consonants. Row S-2 shows the syllabic wave; the lexical accent associated with some of them; and the discreteness or connectedness of these nuclei. Row S-3 shows the relationship of such joining or separating of syllables to the concept of the word, and, in addition, shows the primary and secondary stresses of its "word" units.

The next row is the domain of the phrase and of the primary accent in each phrase, and is associated with grammar. It is separated into two levels of tempo, first, because different rates of speaking exist, and because poetry can often reasonably be spoken at a more deliberate rate than ordinary matter. Comparatively slow speech rates have, besides, a greater acceptability than very rapid rates even for the performance of poetry, because as rate increases

distinctions are lost, and the sense, too, can be lost, because the complexity of some poetry demands time for grasping meanings.³⁷ Second, the rate of speaking affects the length of phrase into which speech is broken, and the length of phrase determines the position of potential stresses for each unit. Therefore, the two levels are Row S-4D, Deliberate, and Row S-4N, Normal. Row S-4D carries the breaking into the smallest word groups which are consistent with sense, but might be those of a dignified, deliberate, stately, but not foolish speaker -- the slowest reasonable tempo. Row S-4N shows the phrases at the more ordinary pace of casual speech. (Even the phrasal breakings of very rapid speech do appear in the Basic Chart since the next row, S-5, shows clauses, and could be viewed as showing the junctures occurring in the upper limits of clear but very rapid speech. At this kind of pace, however, the dispositions of stress important to prosody can hardly be marked.) The two Rows, S-4N and 4D, show the stresses and breaks of two sense readings, but later, when vertical tabulations are made, those breaks which do not disappear at the normal pace are taken as the most fundamental for a reading by phrase.

If rate dictates the separation of the S-4 Rows, the problem remains of what criteria dictate the points of separation, the junctures, within each row. There are two: the principles of grammar, and the phonemic principle of contrast. The literary scholar can apply principles of grammar without, perhaps, direct recourse to

the sound of the text, but he can only apply the principle of contrast by means of sound. Again, unlike the linguist who is listening to a particular performance and marking junctures from the evidence of configurations of pitch and sustention characteristics and silences, the analyst alone at his desk is forced to project, perceive, and analyze his self-made samples of sound. He may have, but cannot always have, recordings of performances of the selection, oscillograph or spectrograph data, and a handy set of representative listeners to tally what is perceived as relevant sound out of the actual sound, so that he can compare the results of the physical data. He is, therefore, the target of criticism which objects that his sample of sound is too limited, his perceptual check too individual. To this objection he can only answer by methodically submitting a wide range of his own samples to his judgment and keeping his judgment as unprejudiced as possible. He may also remember for his comfort that speech sound, whatever its actual form, is nothing but disturbance of air particles until passed through the ear into the mysterious activity of the human brain, which is able to translate it somehow into terms which can be presented to its decoder and passed on as signals to meaning.

In order to maintain as much objectivity as possible, the contribution of semantics is not invoked as a control here because it is difficult to measure or manage the force, direction, and extent of such control.

Grammatical aid to finding the points of separation is available in both traditional and the more recent structural and generative systems and the assistance of all is needed because no system of grammar is perfect and because results will be checked again by phonemic testing. No one system is recommended here because, although the central concepts of the various kinds of grammar are clear and practical, the outward edge of every system is a vague border of unsolved problems or problems "solved" by naming the recalcitrant or isolated peculiarities.

Traditional grammar, with its emphasis on the principle of dependency, will suggest most of the same small phrase groups that structural grammar can arrive at such as:

A noun and its modifiers,
 an adjective and its modifiers,
 a verb and its modifiers,
 a verb and its auxiliaries,

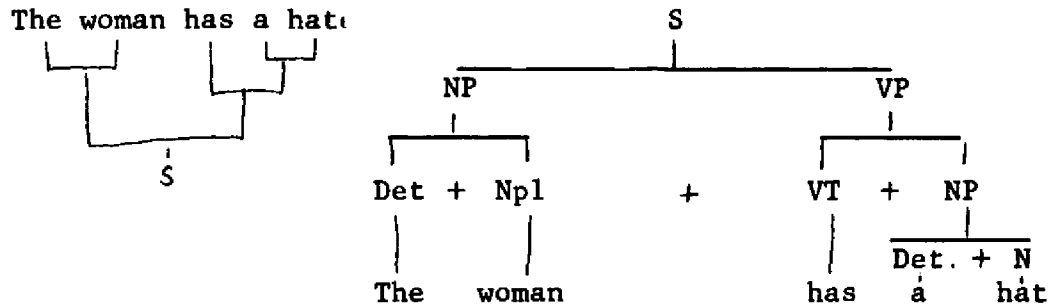
or such bundles as

prepositional phrases,
 coordinate structures

It is, however, outside of the scope of this dissertation to describe systems of grammar in the particulars of their application, but the question of the applicability of generative grammar as an aid to isolating phrasal groups does arise.

Generative grammar moves in the wrong direction for separations. It is the reverse of the operation of immediate constituent analysis.

It seeks those rules by which grammatical structures can be generated, where IC grammar seeks rules by which what has been built can be broken apart, and indeed the upright "tree" shape of an IC analysis is the reverse of a generative grammar "root-growing" shape (as long as there are no transformations or deletions).



Obviously, in my system, where break-down analysis is in order, generative grammar is a long road to take. Moreover, the available generative rules are not yet sufficiently refined to permit generation of all the complex sentences of poetry. Therefore, in order to generate a given sentence in a poem it is sometimes necessary to work out many problems and test out the solutions, an interesting but time consuming process. Further, since metaphorical statements are "ungrammatical" by definition, the necessary kernels cannot be generated, such as the matrix "April is a person" and the kernel "The person is cruel." Nevertheless, applying the generative process does reveal hidden relationships and is informative in showing the origins of many commas which might be "felt" to be necessary, and, while perhaps the omission or elision they often represent could be

guessed at and suggested by traditional grammar, going fully through the process of generating the sentence in question by generative grammar, starkly reveals the "deletions" that underlie them.

In the Eliot selection the coordinate kernels "April is a month" and "April is breeding lilacs" are combined by the deletion of the conjunction and its replacement by a comma. Certainly, the explanation for the comma is not here newsworthy or needed, but many such deletions are concealed in poetry, and the process of generating the sentences of the poem does reveal them. The process of generating could even be invoked to defend an editorial decision or to clarify a textual difficulty about punctuation. In any case, the effort to justify phrasal separations with the help of the analysis of the grammatical forces underlying groups is clarifying.

That the potential breaks or junctures in spoken English coincide with points of separation between syntactical groups has long been known and has been thoroughly demonstrated by structural linguistics, and grammar helps to decide on most. However, a test of the kind of meaning change created by the presence or absence of a break serves as a further check on the inherent position of potential juncture and to classify the change as gross or subtle. That is, a break can be classed as one which is phonemic and alters the entire meaning or one which is not phonemic in the system here, but adds the speaker's special attitude or emphasis and merely shifts focus and dimensions within the same frame of meaning.³⁸

The first gross kind of change in meaning caused by entrance of various junctures shows in an example from Hill:

John looked right at Mary.

John looked right at Mary.

John looked right at Mary.³⁹

All are different in meaning. If such an ambiguity arose in charting a poem where context did not immediately indicate the proper choice, then such an ambiguity would have to be marked in the Basic Chart with x's over the ends of right to show the uncertainty, raIt .
 Ultimately, for a performance, a decision would have to be made, but on the Basic Chart conflict and potential are acceptable and are displayed precisely so they will not be forgotten, but rather, remain present to irritate and to demand consideration in final performance.

The second kind of meaning change, the addition of the speaker's emphasis or attitude is not entered on the Basic Chart. A little experimenting (putting obvious pitch changes aside as much as possible and sustaining the pitch of the last syllable) will show which of the potential breaks might add dimensions of special emphasis beyond the neutral. For example, in the Eliot selection, "April is the cruellest month" is declarative and informative, and experiment with various separations show which create special emphasis. In a Performance Chart some such emphasis might be indicated, but only as an individual stretching not clearly indicated by the structure of the poem.

April is the cruellest month (declarative, deliberate)
April is the cruellest month (special emphasis on is)
April is the cruellest month (special emphasis on the)
April is the cruellest month (special emphasis on cruellest)
April is the cruellest month (declarative, deliberate)
April is the cruellest month (emotion choked? stupidity?)
April is the cruellest month (special emphasis on cruellest)
April is the cruellest month (special emphasis on is and the)

The breaks, then, on the basis of this contrastive principal are:

S-4N April is the cruellest month

S-4D April is the cruellest month

It might be worthwhile to add that the degree of sustention and pause at potential breaks can affect meaning. For example, in the phrase men and women a minimal sustention after men could be normal as in:

men and women

whereas greater degree becomes at some point an indication of after-thought, and, therefore, changes the relationship of the two items from coordinates to dominant and less dominant items.

men and women

Such a break would probably be punctuated with a dash, which is customarily employed precisely to indicate long pitch sustention and pause

men -- and women

In experiments with juncture, of course, the break employed is only the minimal sustention or break necessary to create separation. Sustention juncture involves lengthening the duration of the final syllable of the group,⁴⁰ thereby helping to direct attention to that syllable if it is a monosyllable, or, if it is an unstressed final, to the word it lies in, thus creating special emphasis when a break is postulated after such a word as "the."

Once potential junctures have been established, the remaining characteristic of their domain, the primary stresses, can be easily marked. Perhaps it should be restated that the phonetic actuality of terminal junctures and various degrees of stress are accepted here. The grades of stress and pause are arrived at in this system by first apportioning stresses by kinds in relationship to the units of separate rows, and junctures by kinds, minimal on Row S-2, potential on the S-4 rows; major in the alleys, and second by summing them vertically. However, here, especially on Row S-4N, where phrases are relatively long, the assignment of stresses into four phonemic levels, even if such levels were accepted as phonemic, would become difficult and open to argument. Attempts have been made to work out rules which describe and predict what happens, but none, I believe, is sufficiently certain, accepted, or simple to be a practical guide.⁴¹ If

the order of incidence of relative stresses is in doubt, so is the very number of them. What is much clearer and generally agreed upon is that there is one and only one primary stress in any phrasal group set off by junctures and that it is generally situated toward the end of the phrase on the last lexically accented syllable or full monosyllable.⁴²

Therefore, on each S-4 Row, with each group a kingdom to itself, one potential phonetic primary stress can be assigned to each group on the most important syllable that does not create a special emphasis or a feeling that stress is moved out of normal position. If there is only a monosyllable between junctures, it receives the primary stress for that group, and if there is a polysyllabic word between junctures, the lexically stressed syllable receives the primary stress, as in the cases of "is" and "memory" in the Eliot, Row S-4D. The primary stress of one group is not equated in degree of force with the primary stress of some other group either in this system or in the Trager-Smith.⁴³ Like two kings of equal domains, they may have power not related to the size of their domains and not equal to each other. Usually decision is simple. Ordinarily in a noun phrase such as the big boy the noun receives stress, but in the Eliot there is a noticeable pull between adjective and noun in such groups as "the dead land," "with spring rain," "dull roots." It is not necessary to weigh semantic force behind this pull, but it is necessary to consider the grammatical force. The ambiguity of function of "dead" and "spring" tend to

create a break since "the dead" and "with spring" both could be complete phrases without further addition, and therefore a potential juncture is marked after "dead" and "spring" on Row S-4D. Such nominal modifiers, moreover, either as separate words or in compounds are generally known to receive some stress.

The summary of controls, then, for these rows is:

1. tempo, deliberate for S-4D, normal for S-4N.
2. grammar and syntax as indicators of likely phrasal groups.
3. the phonemic concept of contrasting utterances identical except for one sound, as a check on separations into groups.
4. the concept of separate domain of groups between junctures.
5. the apportionment of a primary stress to each domain checked to prevent creation of special (moved) emphasis.

The next row, S-5, the clause row, shows the clear separations that punctuation in the print has dictated. This information is redundant, as far as showing lengths of clauses is concerned, because the pauses have appeared in all the sound rows so far and are a reflection of the print row P-5, but row S-5 provides a convenient place to enter the sum of what is known about the complex of stress in its relation to its components, pitch, duration, and loudness. It is, therefore, the place, also, where pitch information (not

supposition) can be entered and where a few supplemental, very small variations of duration in the junctures are collected and represented by small insignia. Their meaning is discussed along the way in the next chapter on the stress complex, and explanation of their entry on the Basic Chart must be delayed until the end of Chapter II. Here, too, appear numbers and dashes in parentheses. These are the grades of stress and pause potential summed in a vertical tally. They are explained in Part II of this chapter.

There remain three rows, S-6, S-7, and S-8, whose units are moving in size from the domain of rhythm into the domain of structure, and thus somewhat away from sound details, but, of course, any unit on any one of these rows can well contrast with another unit on the same row. If the matter is pertinent, as it is in a change of voices, the contrast can be marked, as it would need to be on line 150 of The Waste Land to show the change of voices:

"Oh is there, she said, Something o' that, I said."

where the first sentence would probably be in some different pitch, tempo, or timbre from the second, but at least a general change of some kind would be made and could simply be indicated by \updownarrow a mark between units, indicating that an overall contrast in this size of unit is likely to begin.⁴⁴ In a Performance Chart the kind of contrast could be specified.

Row S-6 is a convenient place for a grammatical diagram of some kind. Syntax, discussed as the way to locate potential junctures on Rows S-4D and S-4N, can be kept visible for reference by any preferred

method of diagramming of those available for representing grammar. In the Eliot chart a traditional diagram is used, but some other diagram could be employed.⁴⁵ Certainly with many a Miltonic sentence it would be difficult to squeeze in the connections in this particular manner. Yet connections should be investigated and relations should be made explicit in the terms and method most convenient to the analyst, so that patterns of repetition and balance will become visible. There is no standard constituent analysis marking that has achieved the status of the old Reed and Kellogg diagrams; the Chinese box,⁴⁶ tree,⁴⁷ slot and filler⁴⁸ are unwieldy, as are generative grammar diagrams. I have seen, however, a practical marking for constituents which employs nests of brackets.⁴⁹

Row S-7 is entitled "structural group" and the control can sometimes be a formal element such as stanza, refrain, quatrain, change in rhyme scheme, repetition of or change from some unit established as a structure guide, but large structural groups are more often expressed in sound by variations in dynamics (Pike's gradients) and their details belong in performance, not in the basic dissection.

These dynamics which accompany large structural units are the long-range expression contours, such as swells or slopes between sections of quiet speech and sections of loud, ringing speech, or between sections of relatively low pitches and sections of higher-placed pitches, or between stretches of slow tempo and stretches of increased tempo where durations are respectively

extended and filled with pause or compressed. These variations are, like the expression marks in music such as crescendo, leggiero, accelerando, marcato, very large patterns in sound, composed as always within the four basic polarities of sound: soft-loud, low-high, short-long, one timbre to another as thin to round, rasping to smooth, breathy to resonant. On Row S-7, as on Row S-6, points where such changes begin or end can be marked on the Basic Chart. Particular patterns for them can be proposed in the Performance Strip.

That rhetorical colors can change the complexion of the meaning is certainly true. There is only one type of shift which changes and destroys the message in the way that the change from [eI] to [oU] alters pale to pole, and that is simply to move out of range of rational delivery of the words of the message. The listener has a code for what is appropriate, acceptable, sane in expressive modulations of the speech continuum. Renderings which move beyond this range "mean" something, but convey a message that counteracts the language of the message. They are outside of linguistics.

The last row, the unit, S-8, reflects the P-8 row, but not always. It is capable of showing that a poem, for instance, complete in itself, may yet be only a section of a longer unit, such as a play.

The long dissection has filled the framework of the Basic Chart with pre-prosodic details which, when re-connected by vertical addition, give the meaning of the Basic Chart.

Part II

Summation

The meaning of the Basic Chart

The meaning of the Basic Chart, when its results are summed vertically, is that it describes a neutral, natural prose reading of the passage concerned. It provides, along with the segmental sounds, six grades of potential phonetic stress and three grades of potential duration for syllables, and, also, six grades of potential pause.

The six grades of potential phonetic stress are computed by vertical summation of the stress components from the sound rows for each syllable. The premise is that the dynamic charge, or potential for stress, of any syllable lies in a scale of degrees, and that the stress potential of each syllable is the sum of the stress properties of that syllable which are revealed by the analysis of the various units of size in which it or its members appear. The scale extends from a dynamic charge of zero through intermediate grades to a high dynamic charge of five. Zero charge is perceived as non-stressed; high charge as stressed. The intermediate grades lie in a scale of phonetic noticeability or prominence termed potential stress and are sometimes perceived as stress. How the six grades of phonetic potential relate to the traditional binary stress in metrics and how they define and describe the rhythms within meters is discussed in Chapter V.

The vertical summation which gives the stress grade for any syllable includes the force of vowel quality from Row S-1, main lexical stress from Row S-2, 'phonetic word' main and secondary stress on Row S-3, and phrasal primary stresses dependent on the structural forces of Rows S-4D and N. Each of the five rows can contribute one unit. A long vowel or diphthong which is given two spaces on the time axis in the transcription is assigned a value of 1 toward stress prominence. All other vowels have no value toward the inherent stress total of any syllable for the Basic Chart. The refinement of value which assonance or alliteration contributes is a prosodic value and is considered in Chapter IV. Any stress mark is assigned a value of one unit. The highest possible grade of stress potential is therefore five, the lowest zero, and the total number of grades is six. For example, the "A" of "April" has an inherent grade of five, "pril" of zero, "is" of two, "the" of zero, and these numbers are entered above Row S-5. The selection is read by these grades, giving the most phonetic prominence to the highest and the least to the lowest, and apportioning the others in accordance with the grade.

However, even in this pre-prosodic step the patterns on which metrics will depend begin to appear in the disposition of stress grades and can be seen in a quick tabulation. The summation is easily done merely with chart in hand, but the components can be abstracted into a tabulation of inherent stresses above each syllable, and the heaping at syllables becomes conveniently visible. The table for the Eliot is given here. It shows major junctures by

double bars, line ends by extended single bars and the stress information from the five sound rows of the Basic Chart.

ELIOT STRESS TABULATION BY ROWS

	5	0	2	4	0	1	4	4	0	5	0	3	2	0	2	4	3	0	4	0	1	1	0	5	3	0	2	4	1	2	4																																																
S-4	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/																																																
S-4	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/																																																
S-3	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/																																																
S-2	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/																																																
S-1	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/																																																
	e	i	r	e	l	i	z	o	u	a	l	z	s	t	m	a	n	θ	b	r	i	d	i	g	l	a	r	s	a	v	o	d	e	d	a	n	d	m	i	s	t	i	n	g	m	e	m	o	r	a	n	c	i	a	s	a	r	e	s	t	e	r	g	d	i	l	r	e	u	s	w	r	o	s	p	r	i	n	g

Although demonstrating the presence of prosodic patterns is not our aim at this point, a glance shows that the alternation of iambic or trochaic meter is not emerging, and that the grades support the general critical agreement that the lines are not best explained in terms of traditional feet.

The six inherent grades of stress potential are also able to show a case where traditional metrics is emergent. For the example a selection from Thomas Campion is used, and a full Basic Chart is given for the first few lines from his "Now Winter Nights Enlarge" (XII in the first book of The Third and Fourth Book of Aires.)

Now winter nights enlarge
 The number of their houres;
 And clouds their storms discharge
 Upon the ayrie towres.⁵⁰

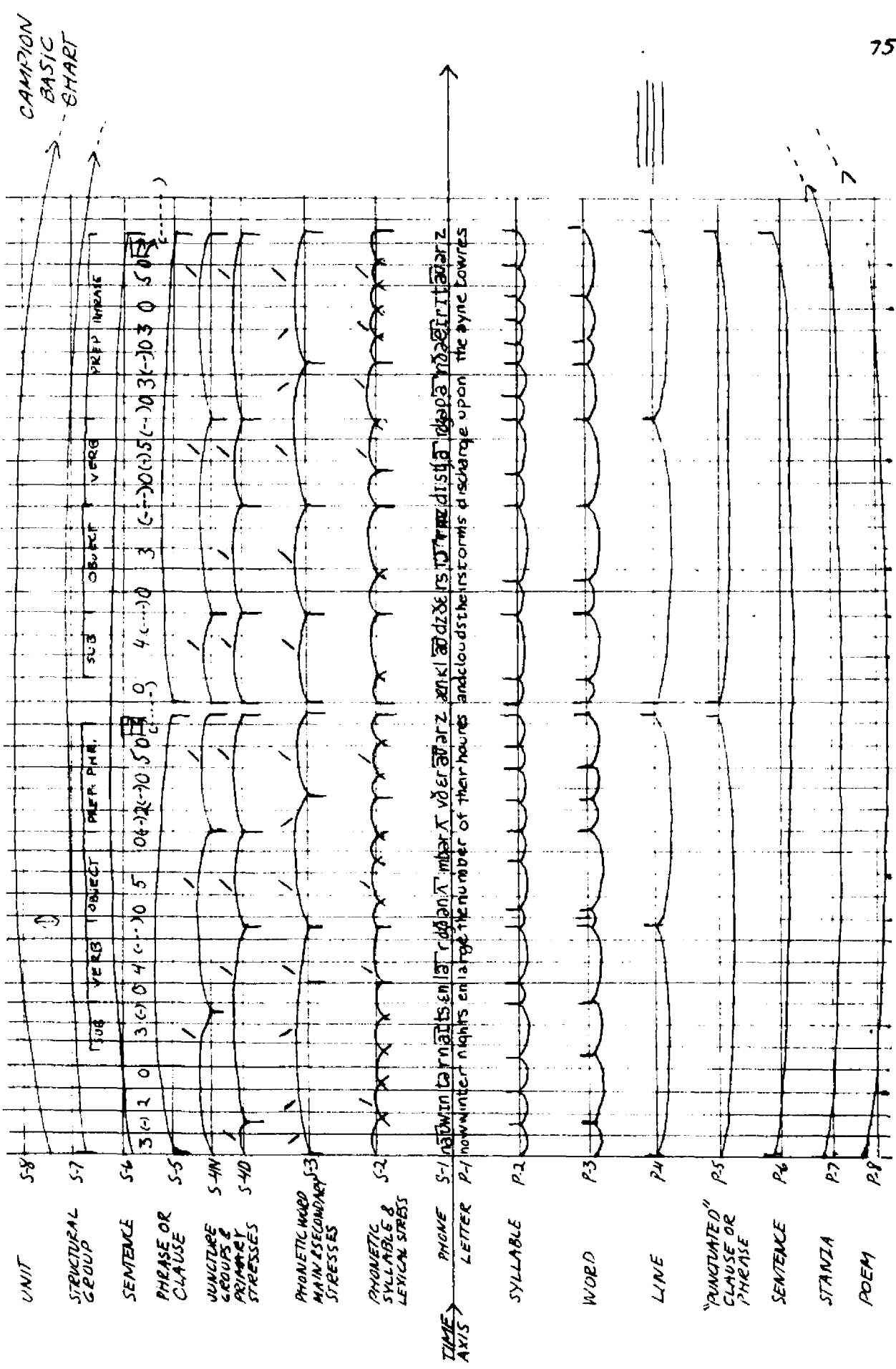
This selection was chosen precisely because the impression it creates opposes that of the Eliot, and because the difference in

impression can be founded on facts that locate the Campion and Eliot toward different poles, a fact which will also be helpful for contrasts in later chapters. The Campion is from an early period, it is rhymed, and it is clearly in meter. It is a song which was set to music by Campion himself. The words of the Eliot selection differ greatly. They are not designed to be sung. They seem to approach prose rhythms or strong-stress rhythms rather than metrical patterns, and they are not rhymed. The polarity of the two selections provides a range in which to explore the application of various theories onto works which seem to differ.

The preparation of the Basic Chart for the Campion selection introduces the problem of making a broad phonetic transcription for a work of another historical period. The problem has no easy solution. Much work, however, has been done on the phonetic details of the English of Shakespeare's time, and Campion's language is of this time so that an attempt at historical transcription is defensible.⁵¹

Equally valid, from another standpoint, however, is the preparation of a non-historical Basic Chart, because the printed text whether it pleases historical correctness or not has most often to be read in today's sounds. The difficulties and the time consumed in attempts to restore the lost qualities of Elizabethan sound are prohibitive, and reading, except by the relatively few qualified to suggest how it might have been read, inevitably must gravitate to a contemporary reading. After a search to uncover any lost rhymes or echoes of vowel color, then, and after the general placing of boundaries between the ascertainable, the doubtful, and the unknown, it is procedurally most convenient

and honest to prepare the Basic Chart on the basis of contemporary pronunciations and save any assembled details of proposed historical transcription for the Performance Chart if so desired.



The appearance of the Campion basic tabulation is square and orderly compared to the Eliot Chart and the stress prominence grades fall in a different sequence, a general alternation of zero grade with higher grades. The abstracted tabulation shows emergent alternation, yet a prose or pre-prosodic reading by the stress potential values remains in keeping with normal English.

CAMPION STRESS TABULATION BY ROWS

	3	2	0	3	0	4	0	5	0	2	0	5	0	0	4	0	3	0	5	0	3	0	3	0	5	0			
S-4N	/			/			/			/			/			/			/			/			/				
S-4D	/	/		/	/		/	/		/	/		/	/		/	/		/	/		/	/		/	/			
S-3	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/		
S-2	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/		
S-1	n	a	w	i	n	t	a	r	n	e	i	t	e	n	i	a	r	d	g	e	n	i	m	h	a	m	v	e	r
	z	e	n	k	a	u	d	z	e	r	s	t	o	r	m	z	d	i	s	t	f	a	r	d	y	a	p	o	
	n	d	a	e	i	r	t	a	u	r	z																		

A comparison of the Eliot and Campion stress potential tabulations shows that they reflect the "felt" difference of the inherent rhythms.

Precisely as consideration of the grades of potential stress begins to lead toward prosody, so do examination of grades of pause and grades of syllabic duration move toward prosodic concern, because there their patterns are relevant in prosody, whereas in ordinary speech they have always seemed less critical. The basic duration grades depend on the basic grades of stress prominence, but are explained in Chapter III.

The varying inherent grade of pause after any syllable is the value assigned to it by vertical summation of the juncture forces. It is in this sum that the force of ends of printed lines of verse in Row P-4 is included. Throughout the explanation of the mechanics of the Basic

Chart, the Print Rows have been little mentioned, but their force is included. The concept of the syllable has provided position for stresses and these positions are not displaced by the difference between the edges of the phonetic and the Printed syllables. The phonetic force of the printed word has been incorporated in the potential breaks of Row S-3, in which printed word edge and phonetically discrete syllable edge coincide. The outer Print Rows 5, 6, 7, 8 mirror the outer Sound Rows 5, 6, 7, 8 and only the effect of Row P-4, the graphic verse line, remains as yet unincorporated into sound. The force of the line as a unit, however, and the force of the line end to oppose or abet potential juncture, is not a pre-prosodic matter, but a prosodic, and is accounted for in Chapter V on metrics.

The vertical count which results in the pause sum includes the forces of phonetic separation shown at work on the Sound Rows S-2, 3, 4D and 5. Row S-5 includes the major junctures. All are assigned one unit, so that the highest number of pause potential is five, the lowest zero, totalling six grades in all.

For example, in the Eliot, at the end of the "A" in "April" There are no junctures, at the end of "April" there are two, at the end of "April is" three, "roots" four, "month" five. The potential juncture total after each is marked by shorthand rather than numbers to keep it clearly separate for the eye from the stress numbers. The marking is none (no mark), one (-), two (--), three (---), four (----), five (-----).

Pause, however, is better defined as available space for either sound or silence than as mere silence. It is potential room into which sound can extend. For example, the Eliot first line is:

April (--) is (---) the cruellest (---) month (-----) breeding (----)

In a reading, potential can be made actual in several ways: by extending sound to fill the space as would probably be done after "April" or "is"; by using mostly silence as after "month"; or by combining extension with very slight break as after "breeding." Admittedly, pause lengths seem to be micro-details, yet if the introduction of a longer pause than expected can change a compliment:

"You spoke very well."

into a possible insult:

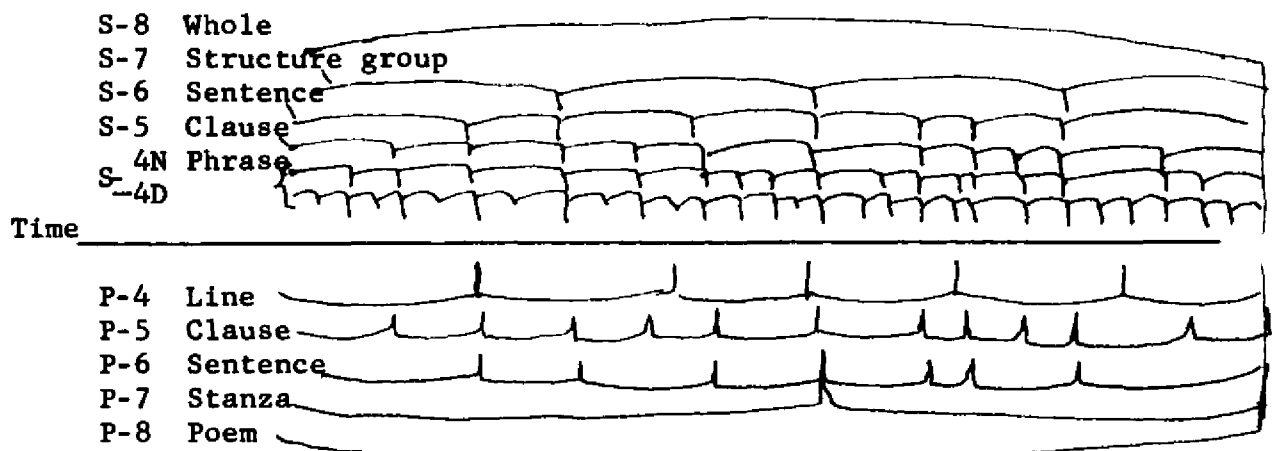
"You spoke very -- well."

then potential pause and its shades deserve attention.⁵² Moreover, the grades of potential pause are important in prosody to help distinguish fore-stressed units from end-stressed and, in strong-stress metrics, where distance between stresses is the relevant unit, to provide room for sufficient stretching or compression to make the strong stresses a functioning pattern. Pauses, therefore, reenter the discussion in Chapter V on metrics.

The Basic Chart both serves as a guide to a neutral prose reading and as a step toward prosodic concerns. The Basic Chart is

a pre-prosodic structure designed not only to reveal the potential span of sound but also to provide a framework to show the patterns of sound repetitions and prominences on which metric pattern is founded.

In general, therefore, a full Basic Chart is preferable to any partial chart, but in practice some rows could be omitted in any one of three ways for special purposes -- as long as recognition is retained that a partial chart is always partial, incomplete, and, therefore, only a temporary convenience. If the force of the study is to be mainly prosodic, then it is practical to limit the chart to the inner rows by the dropping of S-7 and S-8 and P-5, 6, 7, and 8. A different partial chart is useful if the focus is to be on the relationship of large or structural units; then the chart can be limited to the outer rows by dropping out the central lines of the smaller units. The study of structure can be further facilitated by reducing the overall scale, that is, by condensing the units apportioned to time on the x axis so that patterns of relationship in clause length, sentence type, and structure blocks become visible in relation to printed units. A poem might then appear:



A third kind of partial chart is useful when the focus is on instrumental recording of phonetic detail in relation to the smaller size units; then the chart can be limited to the four central rows, and the study can be assisted, as has been mentioned, by greatly expanding the units apportioned to time on the Basic Chart, until they coincide with the units of time used in the recording, so that micro-details from it can be entered directly.

A Basic Chart covers only several lines, but for analysis of longer stanzas or long poems or, indeed, for comparisons of any sections of a work or of two works, a series of Basic Charts is efficient. They can be prepared as a sheaf of pages in continuous transcription, and the charting can be broken wherever the page fills. These can be laid side by side for particular study of any section or, for example, if the study involves comparative analysis of the poem's stanza structures, quick tracings of one stanza can be overlaid over another. The overlays would reveal the structural variations among stanzas and, therefore, the extent of the force of the stanza as a controlling pattern in the selection.

The full Basic Chart includes two notations not yet covered in the discussion of mechanics or meaning, the insignia above Row S-5 and the letters above Row S-1. The insignia show pitch; the letters represent basic syllabic duration grades. In order to demonstrate these pre-metric components, however, discussion of the components of stress and the way in which they can be graphically represented is needed. The next chapter, therefore, deals first with the stress

complex and then with the pitches and durations which complete the pre-prosidic Basic Chart.

Chapter II Footnotes

¹The Complete Poems and Plays: 1909-1950 (New York, 1952), p. 37.

²Trager-Smith four phonemic degrees of stress, Outline, pp. 35-39.

³There is a summary by C. M. Wise, "Thesis and Antithesis in the Evolution of English Linguistics," In Honour of Daniel Jones, ed. David Abercrombie, D. B. Fry, P. A. D. MacCarthy, N. C. Scott, J. L. M. Trim (London, 1964), pp. 206-216.

⁴For a Praguian view of various theories of relationship see Josef Vachek, The Linguistic School of Prague: An Introduction to its Theory and Practice (Bloomington, Indiana, 1966), pp. 40-78, and for a Praguian statement, Roman Jakobson and Morris Halle in the opening section, "Phonology and Phonetics," in Fundamentals of Language (The Hague, 1956). Elbert R. Moses, Jr. gives a short history of various views, "The phoneme," Phonetics: History and Interpretation (Englewood Cliffs, N. J., 1964), pp. 33-34.

⁵Phonemics: A Technique for Reducing Language to Writing (Ann Arbor, 1947), p. 57.

⁶Here, by incorporating results of various schools two somewhat contradictory definitions of the phoneme are put to use. Daniel Jones in The History and Meaning of the Term "Phoneme," Supplement to Le Maître Phonétique, CVIII (1957), p. 11, defines the phoneme as "a group of related sounds of a given language which are so used in

connected speech that no one of them ever occurs in positions which any other can occupy." This concept is used here, since a connected movement from a broad transcription to the possible use of narrowed details for performance implies that the broad symbols are classes of sounds. Furthermore, the distribution principle used in phonotactics is used to assist in the marking of syllabic boundaries. The Praguean concept of the phoneme as a bundle of distinctive features and of the relevance of meaning in contrastive tests is used because acoustic phonetic findings involved with the distinctive features are relied on and because in listening for distinctions which change meaning, as for the breaks which prevent ambiguity, the criterion of meaning is employed.

⁷Applied Phonetics (Englewood Cliffs, N. J., 1957), p. 78.

⁸pp. 25-30. Additional useful details are on pp. 81-145.

⁹Wise, pp. 102-105. See also John S. Kenyon, American Pronunciation, 10th ed. (Ann Arbor, Mich., 1960), § 271-288, and Kenyon and Thomas A. Knott, eds. A Pronouncing Dictionary of American English (Springfield, Mass., 1953).

¹⁰Cf. the American Phonemes given by Morton W. Bloomfield and Leonard Newmark, A Linguistic Introduction to the History of English (New York, 1964), p. 67.

¹¹Charles F. Hockett in A Course in Modern Linguistics (New York, 1958), pp. 31-32, discusses the argument about diphthongs: "Linguists who have worked with English phonology are in disagreement as to the

status of these seven vowel-like elements. Some believe that a word like bay contains a vowel which can be identified with the initial phoneme of you, yes (our /j/). For them, once the symbols "e" and "j" have been assigned the values just indicated, then the notation /bej/ for the word bay, or /bejt/ for the word bait, is a necessary consequence. A similar line of reasoning justifies the other compound notations with "w" and "j" as the second mark.

Other specialists in English phonology disagree, feeling that everything after the /b/ in bay is just a single phoneme, entirely on a par with everything between the initial and the final consonant of beat, bit, bet, bat, and so on."

Wise in *Applied Phonetics*, pp. 95-98, also discusses the argument. "Phonemicists, thinking through the problem of transcribing diphthongs phonemically, may decide that /j/ and /w/ are the proper and inevitable final symbols for use in the five common diphthongs. They would be the last, however, to insist that phoneticists should feel obliged to use them in practical transcriptions" (fn. 19, p. 97). Some do, however, on the basis of acoustic phonetic evidence, which, as Wise points out, can be interpreted two ways, and he argues for the use of /I/ and /U/.

¹²Outline, p. 27.

¹³Gordon E. Peterson and M. S. Coxe show that, although it is common knowledge among phoneticians that /e/ and /o/ diphthongize slightly, appreciable diphthongization is restricted to certain kinds of stressed syllables, "The Vowels [e] and [o] in American speech," QJS, XXIX (1953), pp. 33-41. See also Wise, pp. 17-18 and 96-97.

¹⁴Gunnar Fant, Acoustic Theory of Speech Production (The Hague, 1960), p. 23, reports that "The word [mama], for example, containing four speech sounds, may be dissected into four corresponding acoustic units. The same would be the case with the word [nana]. If a tape recording of these words is divided into these appropriate segments and respliced with an exchange of all [m]-sound intervals for [n]-intervals, there does not result a corresponding phonemic shift, as observed from listening tests. An interchange of the "vowels," on the other hand, does cause a shift in identification." Fant's account is based on A. Malécot's "Acoustic Cues for Nasal Consonants" Language, XXXII (1956), 274-284. He also gives other more technical examples showing "overlapping." See also the "hub" principle throughout Ralph K. Potter, George A. Kopp, and Harriet C. Green, Visible Speech (New York, 1947). Martin Joos discusses the "slur" or the causes behind the descriptive statement that "the effect of each consonant extends past the middle of the vowel, so that at the middle the two effects overlap" (pp. 104-126), and the "smear" or instrumental lag of spectrograms (pp. 66-87), Acoustic Phonetics Language Monograph No. 23 (Baltimore, 1948). S. Ohman presents data to show that the transitions between a voiced stop and a preceding and following vowel are both influenced by both vowels. "Coarticulation in VCV Utterances: Spectrographic Measurements," Journal of the Acoustical Society of America, XXXIX (1966), 151-168.

¹⁵For a brief but excellent and not highly technical account of consonant cues in vowel formants see the section on pattern playback

experiments using synthesized speech in the Bell Telephone Laboratories publication: Peter B. Denes and Elliot N. Pinson, The Speech Chain: The Physics and Biology of Spoken Language (Baltimore, 1963), pp. 129-135. Listeners hear p, t, or k before a vowel although representation of the "plosive burst" which signals these consonants has been removed. One of the frequency components of the vowel seems to convey these consonant cues.

¹⁶Potter, Visible Speech, pp. 55, 60, and throughout; R-M. S. Heffner, General Phonetics (Madison, Wisc., 1950), pp. 30-40; Harvey Fletcher, Speech and Hearing in Communication (Princeton, N. J., 1953), pp. 62-67; D. B. Fry, "Duration and Intensity as Physical Correlates of Linguistic Stress;" A. S. House, "On Vowel Duration in English," Journal of the Acoustical Society of America, XXXIII (1961), 1174-1178; Ilse Lehiste and Gordon E. Petersen, "Transitions, Glides, and Diphthongs," Journal of the Acoustical Society of America, XXXIII (1961), 268-277; Pierre Delattre, "Some Factors of Vowel Duration and Their Cross-Linguistic Validity," Journal of the Acoustical Society of America, XXXIV (1962), 1141-1143; Dwight L. Bolinger, "Length, Vowel, Juncture," Linguistics, I (1963), 5-29; Donald J. Sharf, "Vowel Duration in Whispered and in Normal Speech," Language and Speech, V (1964), 89-97. The length of diphthongs appears in Kenneth N. Stevens, Arthur S. House, and Allen P. Paul, "Acoustical Description of Syllabic Nuclei: An Interpretation in Terms of a Dynamic Model of Articulation," Journal of the Acoustical Society of America, XL (1966), pp. 123-132.

¹⁷Gordon E. Petersen and Ilse Lehiste, "Duration of Syllable Nuclei in English," Journal of the Acoustical Society of America, XXXII (1960), 693-703. Donald J. Sharf, "Duration of Post-stress Intervocalic Stops and Preceding Vowels," Language and Speech, V (1962), 26-30.

¹⁸George A. Miller shows evidence for the importance of duration as a distinctive feature in vowel perception. Long vowels are confused with other longs in heed, who'd, had, hod, and hawed; short vowels with short in hid, hood, head, and hud. "The perception of Speech," For Roman Jakobson: Essays on the Occasion of His Sixtieth Birthday (The Hague, 1956), pp. 353-359.

¹⁹For example, Pierre Delattre believes that vowel length is conditioned, "Some Factors of Vowel Duration and Their Cross-Linguistic Validity," Journal of the Acoustical Society of America, XXXII (1962), 1141-1143, and he disagrees with Arthur S. House who believes that the greater effort involved in pronouncing a coming consonant affects vowel length, "On Vowel Duration in English," Journal of the Acoustical Society of America, XXXIII (1961), 1174-1178.

²⁰What is called "normal" transition in the Trager-Smith Outline (p. 37) and defined as "the phonetic characteristics of the manner of offglide and onset from any one segmental phoneme to the next" is indicated by them (and generally in other phonemic and broad transcriptions) by writing symbols without any intermediate marks. Bloomfield and Newmark, for example, symbolize separation between "phonemic words" by a space, but phonemic minimal juncture by a hyphen /-/, pp. 76-77.

²¹Trager-Smith give phonemic status to the plus juncture /+/ which interrupts to separate "is" and "the," the /iz+ʔλ/ in some pronunciations, from the /izʔλ/ which occurs in others, or it interrupts to distinguish /λ+neym/, a name, from /ən+eym/, an aim, Outline, p. 38. However, to set aside the criterion of meaning puts two events of different function in the same class. In the first, the difference between /izʔλ/ and /is+ʔλ/ may change the attitudinal meaning but not the hard core of the message. In the second, the difference between /λ+neym/ and /ən+eym/ shifts the primary meaning. The first I do not accept as phonemic. I regard it as a variety or shade of meaning which shows a variation from the normal in emphasis or attitude. The second, which prevents ambiguity by its presence, does change the hard core meaning, and I do regard it as phonemic.

²²Trager and Smith, studying pitch behavior in the phonetic phenomena at boundaries, isolate the characteristics of pitch "movement" as rise, sustention, or fall, from the starting pitch of the final syllable until terminal silence is reached. From these phenomena they set up three phonemic terminal junctures marked respectively /||/ (sustention), /||/ (rise), /#/ (fall), Outline, pp. 46-47. They are designated as /→/, /↑/, and /↓/ by C. F. Hockett, A Course in Modern Linguistics (New York, 1958), pp. 34-35. Trager and Smith designate a unit marked off by terminal junctures as equally a phonemic, morphemic, and syntactic clause, Outline, pp. 49-50; 56-57; 69, and thus they make the step from sound to syntax. That the terminal junctures are sometimes phonemic in that their presence or absence

can change the meaning of the message is amply demonstrated by this example:

I know Tom and Mary will arrive by eight they perform well.

Breaks introduced at various points produce different meaning:

I know. Tom and Mary Will arrive by eight. They perform well.

I know Tom, and Mary will arrive. By eight they perform well.

I know Tom and Mary will arrive by eight. They perform well.

I know Tom, and Mary will arrive. By eight they perform. Well?

In these cases terminal junctures are phonemic. However, junctures can be introduced at points which do not change meaning but add attitude. They vary from the normal, but do not alter the core meaning.

I know Tom, and Mary will arrive by eight.

I know Tom, and -- Mary will arrive by eight.

The juncture added in the last example is not phonemic. Therefore the terminal juncture is used here as a phonemic necessity where its absence or introduction clarifies ambiguity, but as a phonetic configuration where it adds only attitude.

²³Archibald A. Hill outlines procedure to connect stress, pitch, and terminal phonemes to syntax in his Introduction to Linguistic Structures: From Sound to Sentence in English (New York, 1958), but it is questionable if the literary scholar can fully put Hill's suggestions into practice since details seem to depend on Hill's own speech and require stress degrees difficult to estimate.

²⁴Daniel Jones, The Pronunciation of English, 3rd ed. (Cambridge, 1950), pp. 106-109.

²⁵Whatever the syllable is, and it has not been successfully defined, it is perhaps conditioned into our code. Pike notes that "observers of different language backgrounds by no means 'hear' or readily count the same number of syllables in an utterance" Phonemics, p. 65.

²⁶Oxford English Dictionary.

²⁷See fn. 20, 21 of this chapter. The phonetic phenomenon which is accounted for in the Trager-Smith system by plus juncture /+/ (called a "sharp transition within a macrosegment [a section between terminal junctures]" by Hockett, A Course in Modern Linguistics, pp. 55-58) is accounted for on the Basic Chart by the phrase marks showing sharp transition. But sharp transition is considered necessary (phonemic) here only if an ambiguity would occur without its presence as in /aneym/, a name. Otherwise sharp transition is considered dependent on the phonetic properties of the sequence in the continuum rather than on word borders. For example, in "cruellest month" the transition between [st] and [m] is sharp and would also be sharp in "postman." In the Trager-Smith transcriptions /+/ juncture is inserted between most words, but that it is phonemic in most cases seems doubtful. Few speakers make the separation between words clear, and if they do so constantly, they distress their listeners.

²⁸In English [h] is not used as a final consonant and [ŋ] and [ʒ] are not used as initials.

²⁹Lawrence Gaylord Jones "English Consonantal Distribution," For Roman Jakobson, pp. 245-253, concludes his distributional analysis

of final and initial consonant clusters with statement that the analysis can resolve many medial clusters but that the problem of a single consonant occurring medially between two vowels and the problem of medial clusters which can separate two ways are both beyond the scope of such technique. Using synthetic spectrograms, Bertil Malmberg finds modifications in the formants of a vowel which signal whether the adjoining consonant is in the same syllable or not and which, for example, differentiate ag a from a ga, but for the literary scholar at his desk even such limited help is not yet in a form convenient for his problems. "The Phonetic Basis for Syllable Division," Studia Linguistica, IX (1955), 80-87. Chatman reports Malmberg's experiment in lay terms in A Theory of Meter, fn. 21, p. 36.

³⁰Einar Haugen, "The Syllable in Linguistic Description," For Roman Jakobson, pp. 212-219. Haugen states that speakers, when asked to separate syllables without regard to prescriptive spelling rules, show preference for divisions which do not offend the patterns of initial and final clusters in their language and do not introduce divisions which create new clusters, "in subscribe, for example, the only possible division is after the /b/," (pp. 218-219). L. G. Jones' analysis in "English Consonantal Distribution," For Roman Jakobson gives initial and final clusters for General Eastern American English. (pp. 245-253).

³¹Phonotactic study is concerned with privileges of occurrence of phonemes relative to each other and it provides findings on syllabic

divisions based on the structure and distribution of morpheme borders in the language. However, in connected utterances there are forces which serve to join as well as to separate sound at word boundaries. In the analysis here, where each row is under its own control as much as is possible, there can be uncertainties whenever the consonants or clusters between words have members which could act as either finals or initials if the morphemes were not considered.

³²That "difficult" combinations do not cluster and thus can be broken on Row S-2 is borne out by frequency studies. That the clusters in the language are structured by the principle of least effort for speaking and hearing is suggested by Sol Saporta "Frequency of Consonant Clusters" Language XXXI (1955), 25-31. Charles E. Osgood and Thomas A. Sebeok report that the prediction indicated by the distinctive feature analysis in Roman Jakobson, Gunnar Fant, and Morris Halle, Preliminaries to Speech Analysis (Cambridge, 1952) is borne out by the John B. Carroll phoneme frequency data and Osgood and Sebeok show that the lowest frequency of clustering is with phonemes maximally similar or different, and they conclude that "in consonant clusters, maximum efforts for either encoder or decoder are avoided in favor of those situations where the effort is more or less equally divided" in Psycholinguistics: A Survey of Theory and Research Problems. With A. Richard Diebold, Jr., Survey of Psycholinguistic Research, 1954-1964 (Bloomington, Indiana, 1965), p. 102.

³³J. D. O'Connor and J. L. M. Trim, "Vowel, Consonant, and Syllable -- A Phonological Definition," Word, IX (1953), 103-122.

³⁴Hill, Introduction to Linguistic Structures, gives very complete lists in his chapter on phonotactics, in which he is interested in showing the structure system of the kinds of clusters in the language, p. 70-80. See also Hockett, pp. 86, 87, 91.

³⁵Hans Kurath gives lists, A Phonology and Prosody of Modern English (Ann Arbor, 1964), p. 145.

³⁶Outline, p. 56.

³⁷Pike, Phonemics, p. 210. Pike recommends the slow normal for the linguist who is transcribing in order to enable him to grasp clear natural sound. The principle holds for the pre-prosodic analysis of poetry; clear and natural sound is the only basis on which metrical and performance variations can be accurately described. I. A. Richards advises slow reading in performance, very slow for study. Practical Criticism: A Study of Literary Judgment (New York, 1929), p. 222.

³⁸See fn. 22 of this chapter.

³⁹Introduction to Linguistic Structures, p. 327 Hill's interest is in showing all sustention junctures /->/ as phonemic. In the system in this study, however, if no ambiguity in the context creates doubt, sustention junctures are marked as potential junctures, but the pause in John looked right at Mary is not entered as a potential juncture since it involves only the addition of attitude.

⁴⁰Trager-Smith, Outline, pp. 38, 39.

⁴¹See, for example, Hill's Introduction, or Noam Chomsky, M. Halle, and F. Lukoff, "On Accent and Juncture in English," For Roman Jakobson, pp. 65-80.

⁴²The general agreement on the position of the main stress of a phrase shows in the phonetic data that lie behind statements by descriptive linguists whose theory differs somewhat. Trager-Smith specify that the "position of primary stress [is] at the end of a phonemic phrase between terminal junctures in most constructions," Outline, p. 76. Kurath states "The English phrase normally has the heaviest stress at or near the end," A Phonology and Prosody of Modern English, p. 139. See also S. S. Newman "On the stress system of English," Word, II (1946), 171-187. Noam Chomsky accepts the data of Newman and the Trager-Smith Outline as a basis for the statement that "in a sequence of vowels not containing junctures, the final one has the heaviest stress," "On Accent and Juncture in English," For Roman Jakobson, p. 71.

⁴³No claim is made in the Trager-Smith Outline for the phonetic equality of their phonemic primary stresses. However, if we are interested in relations among primary stresses occurring in different phrases, then their disregard of the different phonetic degrees is a handicap. It leaves unordered the rank of the possible phonetic variety among primaries in a sentence which has several phrases and primaries so that no provision is made for discriminating the main stress of the whole unit. For example, the question, Are you reading Macauley? asking if one is reading a book by Macauley is given in the Trager-Smith Outline as one sentence without any internal terminal

junctures and with the primary accent on "cau" and the secondary on "read." But the question, Are you reading, Macauley? asking someone named Macauley whether he is reading is given with an internal terminal juncture and two primary stresses, one on "cau" and one on "read" (p. 46). No provision is made for discriminating the phonetic rank of "read" and "cau." When the primaries are considered as phonetic potential contributing to a collective stress grade at one place, then interrelationships of rank become possible.

⁴⁴Pike, Phonemics, p. 124, calls tempo or pitch change a gradient. But I think it is possible occasionally to show where a few points of probable change stand.

⁴⁵Alonzo Reed and Brainerd Kellogg, Higher Lessons in English, new ed., 1909. Homer C. House and Emolyn Harman, Descriptive English Grammar, 2nd ed. (Englewood Cliffs, N. J., 1950).

⁴⁶Nelson W. Francis, The Structure of American English (New York, 1958).

⁴⁷Eugene A. Nida, A Synopsis of English Syntax (Norman, Okla., 1960)

⁴⁸H. A. Gleason, Linguistics and English Grammar, (New York, 1965).

Gleason also compares systems.

⁴⁹Used in "On Accent and Juncture in English," For Roman Jakobson, p. 70.

⁵⁰Thomas Champion, Works, ed. Percival Vivian (London, 1909), p. 165.

⁵¹Elizabethan consonants fall into phonemic patterns similar to today's and with a few points in mind about characteristic omission or addition of consonants, such as that unstressed ing was pronounced [In] or [n], the consonants can be broadly transcribed with some modest

hope of a fair representation. Vowels, however, are another matter. The Great Vowel Shift was not entirely over, and certain sound changes from Old English to Modern English were still in transition. Spelling is, of course, small guide without the history of the word, and even that is of limited aid. Vowels and diphthongs have to be tracked down in reference books such as Eric J. Dobson, English Pronunciation: 1500-1700, 2 vols. (London, 1957) and Helge Kókeritz Shakespeare's Pronunciation (New Haven, 1953). Since a Basic Chart does not record refinements of pronunciation such as might be necessary on a Performance Chart, but only indicates the span of possibilities, it can include choices if decision among several cannot be made.

⁵²See the tables on duration of syllables and pause from a reading of PL, II, 604-628, in Ada F. Snell "An Objective Study of Syllabic Quantity in English Verse," PMLA, XXXIII (1918), 396-408. See also her Pause (Ann Arbor, 1918) and PMLA, XXXIV (1919), 416-435.

Chapter III

The Stress Complex

The pre-prosodic analysis has specified six phonetic grades of potential stress. It is out of this phonetic variety that the two stress grades of prosody will emerge in metrical patterns. Yet, despite the importance of stress to English poetry, the nature of stress is often misrepresented by casual reference to it as loudness. Such reference, however, is misleading, since acoustic experiment has shown that the physical nature and perceptual cues of stress are complex and include duration and pitch as well as loudness.¹ In this chapter the complex nature of stress is investigated. The action of the three parameters of sound: duration, pitch, and loudness is discussed, and to facilitate discussion and to provide a way of showing the action of the parameters, a notation is given for them which is also suitable for later prosodic and performance needs.

The concept of the nature of linguistic stress has been clarified recently. The old and casual assumption has most often been that, like prosodic stress, linguistic stress is binary and is simply a change on a scale of loudness. Concern about the nature of stress, until recent scientific investigations of language and sound, was mainly prosodic, and the prosodic viewpoint was focussed on the nature of ictus. The traditional prosodic assumptions have been that stress is binary, that metrical stress is best described simply as loudness or force of utterance, and that phonetic varieties or phonetic

components of stress are irrelevant to prosodic description. Traditional prosodic description is mainly limited to defining metrical pattern in terms of syllable and ictus without specifying the phonetic nature of ictus. Both poets and prosodists, however, have long been aware both that all icti are not equal in force of phonetic prominence and that duration and pitch can be involved at stress.² Recently phonologists and phoneticians have presented data which show the importance of grades of stress in the language and which show the importance of pitch and duration in stress. American structural linguists have proposed four phonemic degrees of stress³ and, although all linguists are not convinced, the force of the Trager-Smith arguments is sufficient to necessitate consideration of stress grades in discussions of stress. If degrees of stress can be defended strongly, even if not conclusively, as phonemic, then the presence of various grades of stress cannot be ignored. Phoneticians, furthermore, note that pitch and duration are involved in stress,⁴ and acoustic phoneticians find stress a complex of variables. In Visible Speech, 1947, a report of early spectrograph work, stress is defined as resulting from "changes in loudness, in pitch, and in the amount of time given."⁵ R-M. S. Heffner also finds it a complex, "the result of changes of dynamic stress, of pitch, of duration, and of quality in the sounds or syllables which have the accent. English accentuation always involves at least two of these factors; frequently three contribute to the accent."⁶ Experiments in acoustic phonetics, both on the components of stress and their perception, have confirmed this

complex, and efforts have been made to rank the components in order of perceptual importance. Results show pitch and duration more important than loudness as cues of stress.⁷ If all stresses are graded and all involve three parameters, metrical stress also has these properties and prosodic description can be refined by taking note of them.

The nature of stress seems to be caused by a movement in the three parameters into a configuration different than its surroundings. If it can be shown that these parameters can function independently at any time, then a description or transcription which attempts to represent any stress should include all three parameters. It has been shown that duration and pitch can function independently and that duration alone and pitch alone are better cues to stress than loudness.⁸ Contrast to a ground⁹ can be caused by a change in any one of these three elements of sound, by movements in a pair, or by movements in all three.

In color there can be a situation of contrast which is comparable to the situation of contrast which creates stress in sound. The differences in color are created in three scales: HUE, the spectrum color from the span of the rainbow; VALUE, the scale without hues from white to dark, a familiar component to all through the black and white and gray snapshot, and INTENSITY, the scale of brilliance to dullness. Thus a bright yellow spot stands out more strongly when it differs in both hue and intensity with a dull blue ground, and a bright yellow spot differs in all three scales of hue, intensity, and value from a dark, dull, blue ground.

Degree of difference is the sum of the amounts of difference in three separate scales and those amounts can themselves vary from small to great. The difference is physical and perceptual.

When contrast is relevant to a code it can be phonemic. That is, if the viewer has been given a code in which all spots which seem yellowish, not dark, and not dull, are designated as "stress," he might select a rather dull and dark orange, for example, as a stress, because on a deep blackish blue ground it is the only spot he finds which approaches the given set of characteristics for stress.¹⁰ For him it is stress. Stress is the relative degree of difference from context, in sound as well as in color. Here, however, the point is not the phonemic status of stress but that movements in several parameters create various grades of stress and that, therefore, all three parameters are important in any description or transcription of stress.

Throughout this dissertation, the belief is that the student of the sound of literature wishes to use linguistic findings, yet may not be a linguist. He cannot devote himself to collecting data for making descriptive studies of the sounds of language or of stress; he can only attempt to apply what others present. However, when he endeavors to use the results established by valid experiments on stress, and when he attempts to treat stresses as various complex configurations created by the three parameters, pitch, duration, and loudness, several difficulties arise.

The fundamental difficulty arises from the fact that the various disciplines which deal with stress use different approaches, and, therefore, different terminology and notations. In linguistics, psycholinguistics, phonemics, articulatory phonetics, acoustic phonetics, and, of course, in music, prosody, and literary criticism much is said of stress, but to bring together the statements, or even to express one in terms of the other is not only inconvenient, but is sometimes hardly possible. Even among contemporary linguistic approaches problems arise for the literary scholar who desires to translate one transcription into another or to uncover the data each presents on the three parameters of sound.

Phonemic treatment of stress and pitch, for example, is inconvenient and misleading for any analysis of stress which calls for separating sound into duration, pitch, and loudness in stressed syllables. In phonemic notation stress and pitch are handled separately, pitch figuring in intonation contours.¹¹ This separation of pitch and stress obscures the recognition that they are interconnected and that whatever the actual pitch of the intonation contour is at any occurrence of stress it is also the pitch parameter of the stress complex within that stressed syllable. The phonemic separation of pitch from stress also suggests that both are parameters of sound. The separation obscures the fact that the nature of stress differs from the nature of pitch and that stress is a complex characteristic of sound whereas pitch is a simple component of

sound. Stress is a complex configuration of several components and is difficult to measure, whereas pitch is in a single scale and its frequencies can be measured even if damped. Perceived pitch is sufficiently close to acoustic frequencies in the speech range to permit fairly simple calibration between a mel scale (perceived pitch) and frequencies (physical pitch), at least in pure tones,¹² but perceived loudness and its physical intensity, one of the components of stress, are far from simple to relate, and there are many problems in the acoustic measurement of the intensity of speech sound.¹³

The multiplicity and partiality of graphic forms in which phonetic and phonemic data are transcribed add to the difficulties which face the literary scholar who is interested in investigating the nature of stress. All notations develop in response to needs and practical limitations. The cost of printing and the symbols available in the printer's type fonts combine to squash phonemic notations into one line with arrows, dashes, slashes, and numerals, and severely inhibit the form of notation. The special interests of each study, as here, limit and direct each notation to those aspects of sound pertinent to the particular investigator. His notation may convey much about pitch and amplitude and neglect duration, about which he nevertheless may have a few pertinent words, or he may study pitch in stressed syllables only. Or the results of a study may appear as a graph, or a proposal may be expressed in a paragraph of description. Valuable material,

therefore, is waiting to be used in literary studies, but translating one method into another is a time-consuming and troublesome task since no one notation seems to accommodate all the information residing in another notation and since each method is supplemented by worded rules which control the transcription and which must be remembered in order to make a translation.

For example, consider the difficulties of restating any of these representations in terms of another although they are not unlike:

(A) $\overset{2}{/ow} + \overset{3}{luk}\overset{1}{\#}\overset{2}{ayv} + \overset{\wedge}{fawn} + \overset{\setminus}{may} \quad | \quad (P) \overset{33}{kard}\overset{1}{\#}/$ (Hill)¹⁴

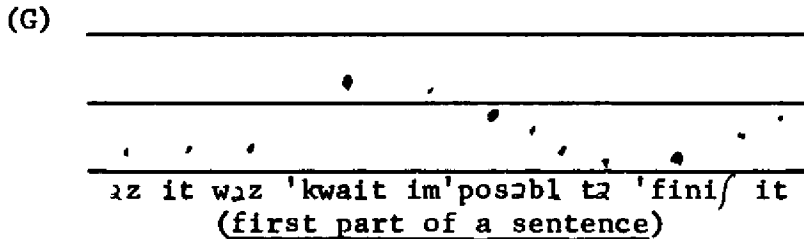
(B) $/\overset{1}{rifar}\text{-}\overset{1}{s\acute{e}l\grave{a}rz} \text{ t}\overset{3}{\acute{u}} \text{ b}\overset{1}{\grave{a}rn}\overset{3}{\rightarrow}\overset{3}{st\acute{a}p} \downarrow \# \text{ mel } \overset{3}{\text{rd}\acute{a}rz} \overset{3}{naw}\overset{3}{\uparrow}\# /$
(Bloomfield & Newmark)¹⁵

(C) $\overset{3}{/h\acute{e}w} + d\grave{a} + \overset{\setminus}{\acute{e}y} + st\hat{a}diy \overset{2}{|} \overset{2}{n\acute{a}w} + wiyv + g\hat{a}t + \overset{\setminus}{\acute{e}hr} + buks \parallel /$
(Trager & Smith)¹⁶

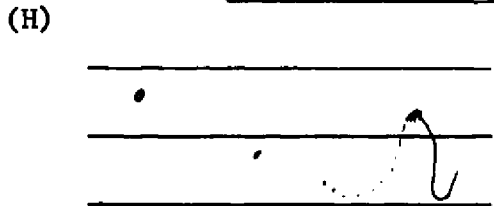
(D) $\overset{\circ}{s}i \quad d\grave{a} \overset{\circ}{s}korpian \quad | \quad wil \ d\grave{a} \quad \overset{\circ}{s}korpian \quad \overset{\circ}{ba}it \ \overset{\circ}{n}\overset{\circ}{o} \quad |$
(Pike)¹⁷

(E) $\frac{\cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot}{/ \text{ its kwait im}'pasibl \ t\grave{a} \text{ 'gou eni 'hai} \text{ } /}$ (Robins)¹⁸

(F) $\frac{\cdot}{\cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot}$
 $\text{it w\acute{a}z 'kwait im}'pasobl.$ (Tune I, Jones)¹⁹



(Tune II, Jones)²⁰



(Implying 'though I don't
 know if it's what he meant!)

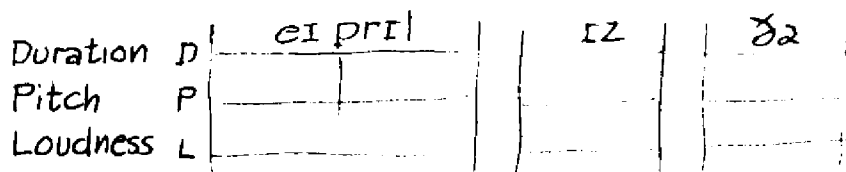
("Emphases for
 Contrast," Jones)²¹

Clearly a notation is needed for the literary scholar which will encompass the three major components of sound plus the segmental phonemes when thought of from the syllable level, yet which will be useful for both general concepts and particular cases and which could even be adaptable to incorporating some of the relevant points from machine measurements of sound. A notation is needed which is graphic, simple, flexible, easy to execute, and capable of both general and particular statement. A notation is needed which provides a way of translating many types of linguistic and phonetic statement and example into one non-scientific idiom where they become clear, succinct, good for comparisons, and useful for prosodic and performance details. The notation needs to relate all data to the syllable, for despite its blurry edges, its variable measurements on the scales of length, loudness, and pitch, the syllable is the smallest unit counted by the prosodist; it is the box that contains

stress, and it is the unit of measure to which he often relates all other units of measure.

A notation is therefore proposed here to answer these needs and to make it possible for the literary scholar to make use of linguistic and acoustic findings. In this notation stress is considered as a complex configuration created by and containing the three parameters of sound: duration, pitch, and loudness. The notation is therefore called a DPL strip, short for Duration, Pitch, and Loudness.

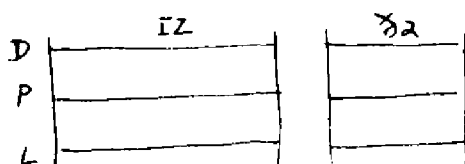
To demonstrate the notation, and at the same time show how some accepted information about Duration, Pitch, and Loudness (DPL) can be represented, "April is the" from Row S-4D of the Eliot Basic Chart is used. The junctures of the deliberate tempo rather than the normal tempo are selected for the demonstration merely because they offer the convenience of two potential junctures within a few syllables. The notation consists of three lines set under the phonemes, divided at syllables by a single vertical between syllables and by a space at junctures. A square is taken as a syllable norm, and the lines represent Duration (D), Pitch (P), and Loudness (L).



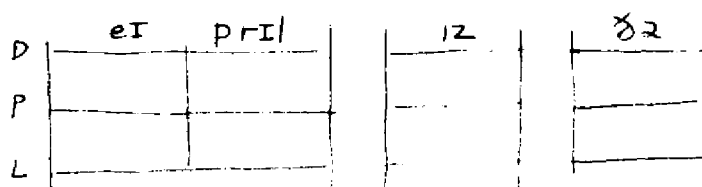
A syllable about which no duration information is given in original data or for which no assumptions about duration are proposed can be represented temporarily as a square. If relatively

longer or shorter syllables occur or are postulated, they can be represented by extending or shortening the block accordingly.

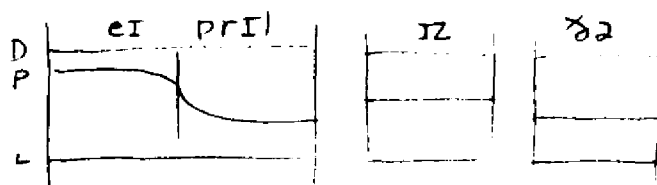
Perhaps, for example, [ʒə] is shorter than [ɪz].



Since little is known about the relative durations of [eɪprɪl], [ɪz], and [ʒə] and it is not even certain whether the syllables divide [eɪ-prɪl] or [eɪp-rɪl], all that can be marked so far is:

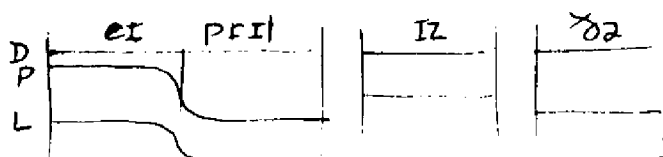


The middle line is pitch. The inherent pitches of the phrase are not established, but for demonstration we may surmise that the first syllable of "April" is higher than the second and that "is" is higher than "the." On the middle line, which is pitch, the supposition can be recorded.



The bottom line is loudness. About this element psychoacoustic experiment has shown that surprisingly little is known. Experiments with increases in amplitude, as shown by the Fry and Bolinger studies, indicate that what has been called stress is far more clearly cued by pitch and duration than by true amplitude, which has to be in notably gross amount to override other elements as a cue to stress. Amplitude does seem, however, often to be greater in what is perceived as stress than in unstress.

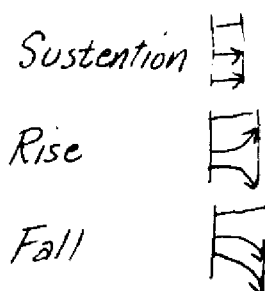
Therefore, some rise in amplitude probably happens at the [eI] of "April." [Iz], however, because it lies between terminal junctures, is marked with a primary stress. It is the only place such a "stress" could go in this little domain, but the problem remains of what constitutes that stress. The pitch of [Iz] seems to rise slightly, duration is not known, no amount of loudness is certain. April is the cruellest month can be said with a quiet or a louder [Iz] but as soon as pitch rise and loudness are increased, a sense of special emphasis on [Iz] is felt, yet the control in this dissertation is to pick the marking which does not create special emphasis. Therefore, all that can be marked is a slightly higher pitch level for [Iz] than [pril].



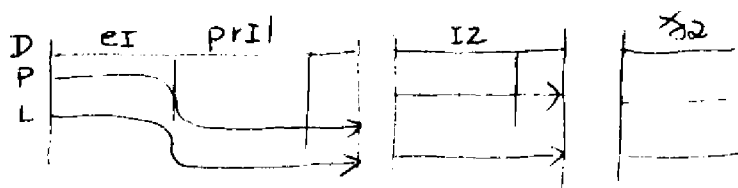
However, more than this is known about what happens to duration, pitch, and loudness in the potential junctures if they are spoken, and the notation can conveniently express what is known to occur there.

Trager and Smith provide explanations of observed phonetic phenomena at junctures as being pitch sustentions, rises, or falls.²² But junctures have been further found to include some changes in loudness, since sound seems to fade along with the falling pitch at /#/ . Falling pitch is an inadequate mark of juncture, however, as Hill points out, because pitch is constantly rising and falling to some degree and some other special quality of sound must appear which identifies juncture. It is duration. "All of the junctures prolong the immediately preceding sound or sounds, but in various degrees." Hill assigns "working formulations" or "length of one average sound for //, one and a half average sounds for /||/, and two sounds for /#/, and he adds that it is "not clear whether it is the down-turn or the trail-off which is the distinguishing feature of /#/.²³

It would seem then that all three factors of sound are involved in ways which can be graphed in DPL notation, not as phonemic units but as phonetic insignia which represent the action of all three parameters and which can be added to syllables before potential or major juncture. The insignia continue to use the three lines for duration, pitch, and loudness to indicate activity before junctures.

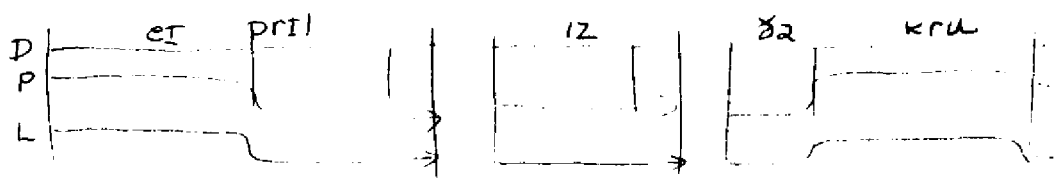


The level of the pitch line continues whatever level is already present in the syllable, and the loudness when it falls, drops away from the loudness already present. Therefore, pitch and loudness could begin at any level. The amount of rise or fall is less extreme than pictured.²⁴

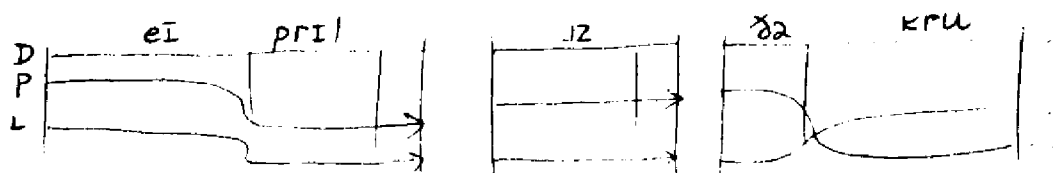


The primary stress on [Iz] simply marks the rank of [Iz] in its group. What the phonetic characteristic of that stress is in terms of pitch and loudness is not precisely known here. The supposition might be made that the phonetic characteristic which creates a sense of stress on a single syllable between junctures may be its extra duration. That is, the isolation of the syllable may make noticeable the sustention before the break. Something, however, is known about the duration of segmental sounds. Diphthongs and long vowels generally do last longer than short ones, unless the speaker is condensing them in haste to reach some more important syllable.

In the selection there is no reason to slight the [eI] of "April," [Iz] already is set off by junctures, and the next important seeming syllable is the [kru] of "cruellest" with its long vowel [u]. Therefore, there is every reason to suppose that [eI] gets its normally slightly longer duration than [I] so that the first syllable can be shown longer than a basic square. Moreover [ʔə] is probably slighted in the movement to "cruellest," and contains only two sounds, one of them the short schwa, so that [ʔə] can be shown shorter than the basic square. The selection now appears as:

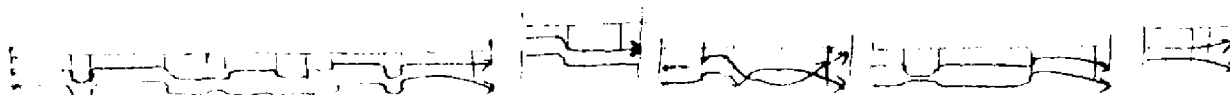


For performance, these details could be altered, of course, but if wanted for the Basic Chart they are appropriate, except that pitch might drop for contrast at [kru] instead of rising.



In either case the DPL strip shows the first and last syllables' probably contrast to the others and makes graphic the components that can join to produce that which is perceived as stress.

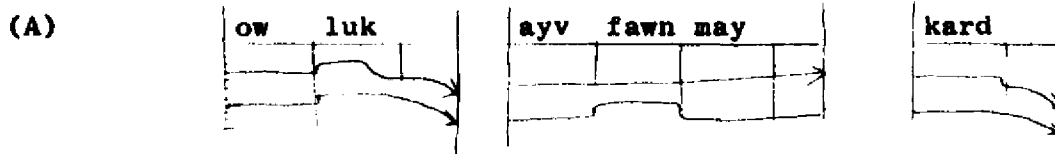
Without pursuit of the notation possibilities very far, it can be seen that degree of pause between groups, change in overall pace, pitch, or loudness of any group could be portrayed in some such results of longer groups as the following diagram:



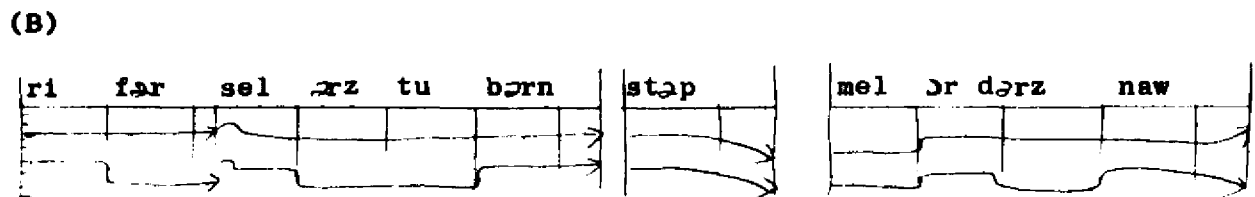
Unfortunately there is no type-face for DPL, but there easily could be and there ought to be since it is a convenient notation which is highly suitable to type.²⁵

When a translation into DPL strips is made of the transcriptions which were given a few pages back to show variety, it appears that some very similar phenomena are recorded by all, especially pitch behavior at terminals and major stresses, and the general contrast which occurs at these points. In each case the details of concepts developed in the systems for which the notations were designed are incorporated in the strip as much as possible. Most of the originals do not undertake to show duration except at terminals, and therefore syllabic durations are put in the DPL transcription as equal, although few would accept "even" syllables as typical of English and almost all the authors of the examples at some point discuss the length likely to be found in stress and the differences between long and short vowels. The connection of some loudness to other components in stress is therefore given form in

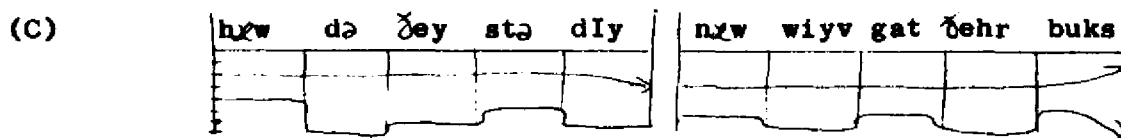
DPL by a rise of the L line according to the level of stress which is marked in the original. I have not changed any of the transcription letter symbols. Details of the bases for translating the suprasegmental phonemic symbols and the prosodic lines, dots, and accents of the phonetic transcriptions are given in the footnotes, and the general commentary is reserved until the discussion following the strips, so that the similar behavior at terminals and major stresses among the various strips can be easily seen. Since the pitch of the intonation contour is what is given in transcriptions, the central line in these strips shows intonation contour.



26

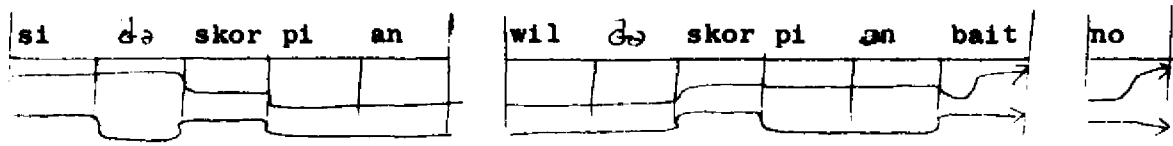


27



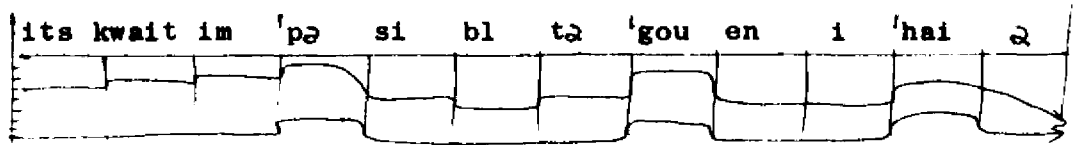
28

(D)



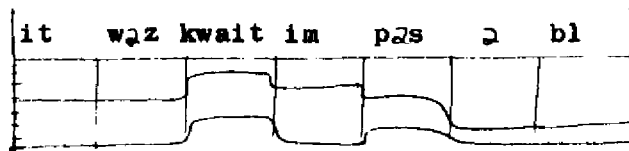
29

(E)

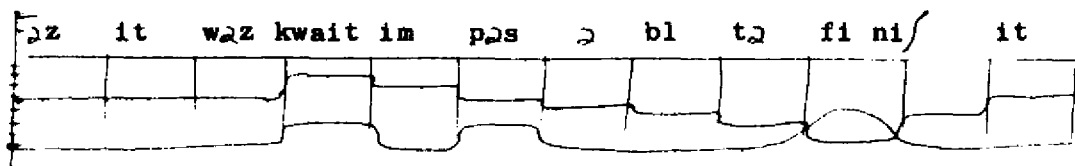


30

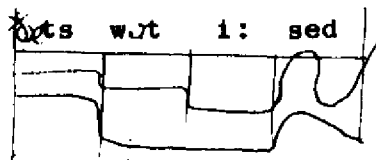
(F)



(G)



(H)



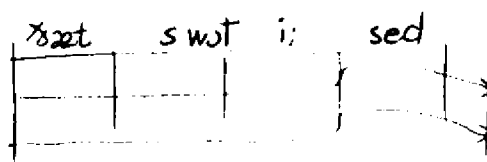
(F), (G), (H)³¹

The strips show agreement on several phenomena. All show the sustentation of pitch at breaks which are not final, as at the second juncture in (A), the first in (B), the central in (C), the first in (D), the last in (G), which is an incomplete sentence. They show the usual fall of finals in the first and third break of (A), the last two of (B), and last of (E), and at (F) the fall from the last stressed syllable. They also show the characteristic rise of some finals at (C), (D), and (H). The strips show the contrast at stressed syllables and also that stress is not always at a rise of pitch but can also be at a fall of pitch, as at the first [skor] in (D) and the [fi] in (G). What seems to differ in the transcriptions is seen in DPL to be the result of presenting similar events in different guise.

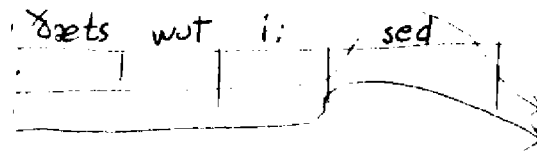
All the examples except the last one (H) and the [no] of (D) were originally transcribed as examples of "normal" or neutral ways of performing the words, but these introduce two varieties of stress and what Trager calls paralanguage. Paralanguage includes voice qualities and vocalizations. The matter of vocalizations, which are identifiable noises, not strictly linguistic such as giggling, yelling, grunting, is not considered here, but voice qualities are. The voice qualities are speech events, "phenomena that can be sorted out from what is said and heard," and which vary from a norm lying in between extremes of pitch range, vocal lip control from rasp to open, glottis control from sharp to smooth pitch transitions, articulation control from forceful to relaxed, rhythm control from smooth to jerky,

resonance range from resonant to thin, and tempo increased or decreased from a norm.³² Such variations add and convey information about the speaker's attitude to his message, as when one woman says to another "What a lovely dress you are wearing," and the second goes home in anger or tears. Both stress for emphasis, unless signalled by typographical device in the poem, and the range of paralanguage do not belong in the Basic Chart, but rather are appropriate as proposals for particulars in the Performance Strip; however, their relation to the DPL strip can be briefly touched on. Example (H) shows both emphasis stress on [ʔæts] and the special play of attitude in the pitch warble on [sed].

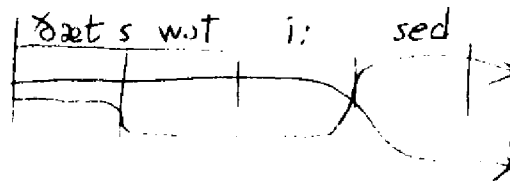
Stress for emphasis is generally understood as either marked increase of stress on an already stressed syllable or as a stress moved out of its neutral and expected position to bring some other particular syllable to attention. That is, a more normal rendering of (H) would be



The change in parameters would be less for [ʔæts], and [sed] would be simplified. The moved or out-of-place stress for emphasis on [ʔæts] would disappear. Stress for emphasis could, however, be added to [sed] which already has the primary sense stress.



Increased loudness and raised pitch (and increased duration perhaps) can signal such stress. A pitch drop along with rise in loudness also can signal stress for special emphasis.



It is possible that the more complicated crossing of the scales of loudness and pitch suggest overtones of meaning, as though some doubt is cast upon the simple declarative statement. If the doubt is awakened then a movement into paralanguage has probably occurred. If a whole phrase is moved out of the general pitch or loudness levels of the context, then paralanguage has been used.

There are occasions when the meaning conveyed by special "play" with language is understood very well, but others when the first question the mind raises is "What did he mean by that tone of voice? What was he implying?" Pike's valiant attempt to classify intonation patterns into an intonation lexicon could hardly succeed because more than pitch is involved. Both duration in the long drawl and the short

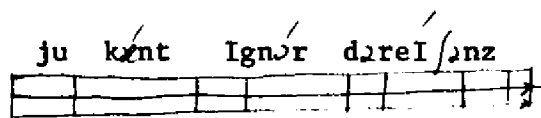
clipped syllable or phrase are used to show the speakers' attitudes. Force enters when a phrase is dropped to a whisper or raised to a shout. Pitch-play on particular syllables or on whole phrases conveys attitudes. The DPL strip can make visible the difference among ordinary stresses and can indicate any stresses for special emphasis. The Performance Strip of the system is in DPL and can show any extreme changes which may be desired.

But more important at this point than discussion of special effects which can be added to language is the fact that all the transcriptions, although they seem faithful detailed descriptions, reveal themselves to be un-English and defective when made visible by translation into DPL. The lack of durations jumps to view and any reading from the strips would therefore not be standard English. It is true that English with un-English rhythm can be understood and that description of English rhythm is a complicated problem, but that does not mean that the problem of syllabic durations can be ignored. Since duration is one of the parameters of stress and since, as previously noted,³³ an increase of the duration of a syllable has been shown generally to cause an increase in judgments of that syllable as stressed, syllabic durations deserve a place in descriptions of English.

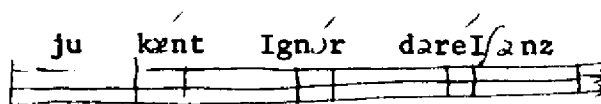
There are some limits, not yet fully analyzed or established, beyond which the duration of any syllable in context cannot be compressed or extended. Of the syllables of a phrase which is bounded by terminal junctures, something is known about the action of duration

in the final syllable of the phrase. Ordinarily, as has been mentioned, the syllable before a juncture is lengthened slightly,³⁴ and, if it does not already carry lexical stress, it is still generally not judged to have become stressed through the additional length. Of the remaining syllables of a phrase, however, less is known about the degree of length which can be added or subtracted without affecting judgments of stress.

There are four basic duration relationships possible among the syllables of any phrase. Syllabic durations can be random or unclassifiable by any clue so far discovered, they can be generally longer at stresses, they can be generally shorter at stresses, or they can be generally even. The first case is ruled out because studies of syllabic length at stress have shown the second to be generally true and the third to be generally not true.³⁵ Anyone can try a simple exercise which shows that there is some kind of limit for related syllabic durations, a limit which cannot be crossed without affecting stresses. For example, the sentence You can't ignore durations is given in "flat" DPL (changes shown in duration parameter only) with stressed syllables longer than unstressed



A reading by this guide does not offend the English ear. However, if the balance of durations is reversed so that stressed syllables are shorter than the unstressed, the resultant reading is un-English, and stresses are confused.



In fact, it is fairly difficult for an English speaker to achieve a reading which follows the guide. Therefore, although the precise degree of allowable duration change is not known, and although there are known to be some exceptions, a full description of any English syllable in context needs to include some guide to its duration relative to surrounding syllables.

Readings from even syllables, such as are temporarily given in the group of DPL translations of the various phonemic notations, omit duration grades. Readings from them would flatten all syllabic grades into one level and would be termed "foreign." Yet readings which flatten pitch and stress levels would merely be termed monotonous. Grades of length for syllables, then, are fundamental to English rhythm. The native speaker is disturbed by lack of action in the duration parameter. He cannot state the rules which limit relative syllabic durations, but he is conditioned to them, and he speaks by them. Linguists are well aware of the fact that even-timed syllabic length is foreign to English, and some have proposed guide rules in response to the problem of teaching foreigners English. Both Jones³⁶ and Pike,³⁷ for example, have found that foreigners learning English need help to move from syllable-timed speech to English rhythms. They suggest that the foreigner shift to stress-timed speech in which the syllabic durations of unstressed syllables are controlled by the distances between stresses.

The difficulty with stress-timing for the problem of syllabic durations is that it does not solve the relationship of the syllabic durations within the stress-timed segment, nor does it solve the problem of how to ascertain which of the available potential stresses are to mark the time segments. Jones finds a "strong tendency" for stressed syllables to "follow each other as nearly as possible at equal distances," but finds many variations which are "dependent on the grammatical relations between the words as well as upon the number and nature of the sounds."³⁸ It is apparent, then, that all potential stresses are somehow not equally reliable as marks for measuring the "equal distances" in time. Pike, although interested mainly in intonation, finds it necessary to devote a section to "The Essentiality of Combining Intonation with Rhythm," and recommends placing "stresses at equal intervals,"³⁹ crowding and extending syllables and silences between them, but he is not clear about the ties to intonation contours and to grammatical phrases although he involves both in the discussion, nor is it clear from his work on what basis syllables could be selected as markers in a printed poem, since he equates the length of time between the marked accents in both examples as transcribed from speech.

'English is 'easy.

An 'English lesson's very 'easy.

On the printed page all the lexical stresses have potential and selection of which ones control time is a puzzle. Jones seems to

refer to closely spaced stresses, Pike to the one strong stress or prominent syllable in "primary contours," which can contain many syllables.⁴⁰

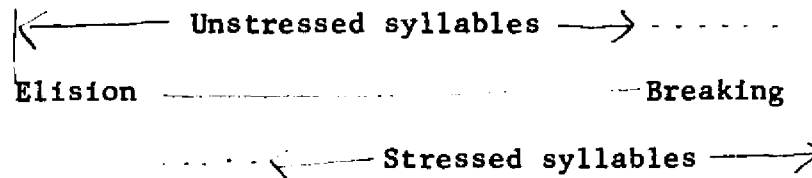
Although the criteria for selecting the stresses which control the length of segments of time are not clear, they are certainly needed by the literary scholar who wishes to find them in the poem under study. If the controlling stresses are located, then the time between them is defined and can be isochronous as Pike and Jones imply, although there is some disagreement that such isochronism is actual.⁴¹ But even if, let us say, the controlling syllables are known and the intervals between them approach isochronism, the condition still does not provide a guide to the durations of those syllables.⁴² However, it is known that various forces in the language do contribute to syllabic length. For example, when Pike states that everything between pauses should be rushed over "except the stressed syllables,"⁴³ then, by mention of pauses he has brought the force of sense groups into the problem of durations, and by mention of the uncompressed stressed syllable he has brought the force of stress into the problem of durations. These same forces which contribute to length are the same which are held to contribute to stress. Therefore, the premise here is that potential grades of duration can be tied to potential grades of stress.

Each of the forces in the pre-prosodic analysis of the Basic Chart which have been held to contribute to stress potential are also associated with length. For example, on Row S-1 the nuclei of

stressed syllables are longer in duration than those of unstressed. Generally now is longer than the, and thus stress and length are related.⁴⁴ On Row S-2 lexical stress is associated with length, since unstressed vowels generally reduce to schwa. The last syllable of succumb is longer than the last of oakum, and again stress and length are associated.⁴⁵ In any group of syllables, as in the phonetic words of Row S-3, some syllables often stand out as stressed more than others, so that pauses or breaks are related to lengths of stretches and to grades of stress, as they are in the S-4 Rows. The Basic Chart provides a way to sum these accumulated forces into stress potential, and logic and gross language conventions can provide a way to relate the grades of stress potential to grades of duration potential.

It is impossible without the data behind a Jones or a Pike or the descriptive linguists to prove a proposition about grades of syllabic duration, but it is possible to suggest one on the basis of logic and their stated findings and to put it to effective use. The fact that an unstressed syllable is longer than a stressed syllable somewhere nearby is not evidence of inexplicability of durations but of the presence of two separate scales in action which overlap. The foundation for this statement lies in generally admitted gross phenomena of English. All syllables can be reduced in duration and some elided to nothing by dialect, carelessness, or an overlaid metrical pattern; all syllables can be stretched for the same reasons, until they break by diphthongization of the

nucleus or by consonantal insertion. That is, beet [bit] can become [bi-ɪt] or even [bi-jɪt], and even it can be stretched to [ɪjɪt]. In general, however, in standard English and the literate E[ɪjɪt]. of most poetry even in a pre-metric reading stressed syllables are not compressed to elision and unstressed are not stretched to diphthongization. Therefore, unstressed syllables can be said to vary in length from zero at elision to some degree of length, and stressed can be said to vary from some degree of length to an increase where breaking occurs. Two scales of elasticity thus exist:



To represent syllables as equal is to ignore these scales, and to try to find examples where the scales overlap and create what seems to be exasperating reversals solves nothing, but my system provides an aid. The principle of dissection in the Basic Chart reveals the presence or absence of each kind of potential stress in relation to the force that creates it. The principle of connection at vertical intersections of phenomena reveals the grade of potential stress for each syllable, and this grade provides a simple guide for assigning syllabic duration. Syllables with no long nuclei and no accumulated stresses and therefore a zero grade of stress potential are assigned a short grade of duration. Syllables with the higher accumulations, the three, four, or five grades of stress potential, are assigned

a long grade of duration and those with a light total of one or two are assigned a medium grade of duration. The relationship is expressed in the working formula:

$$\begin{array}{rcc} \text{Stress grades} & & \text{Duration grades} \\ 0 - 1 \ 2 - 3 \ 4 \ 5 & = & S - M - L \end{array}$$

The formula keeps the overlapping scales of elasticity in which unstressed syllables are in one scale which reaches into "shortness" and the stressed are in a scale which reaches into "length," but the overlap is accounted for by the medium duration for medium grades of stress, in which one medium can be longer than another and can approach equality with some short or some long, and thus represent the typically English elasticity of syllabic durations. These duration grades, when entered into the DPL strips, render readings possible which have English rhythm and which give a basic span of durations. Metrical patterns can be overlaid, furthermore, with clarity, since the proposed compressions or extensions demanded by any particular metric can be considered and discussed against the workable set of potential duration relationships which can be shown on the DPL strip.

The Eliot selection is shown in basic DPL strip with potential durations added. Longs are given two squares, mediums one, shorts a half, not to imply any actual ratios but merely to provide the eye with recognizable stretches as symbols for long, medium, and short. They represent grades only, and therefore the neat

L	M	S
---	---	---

 represents varieties such as

L	M	S
---	---	---

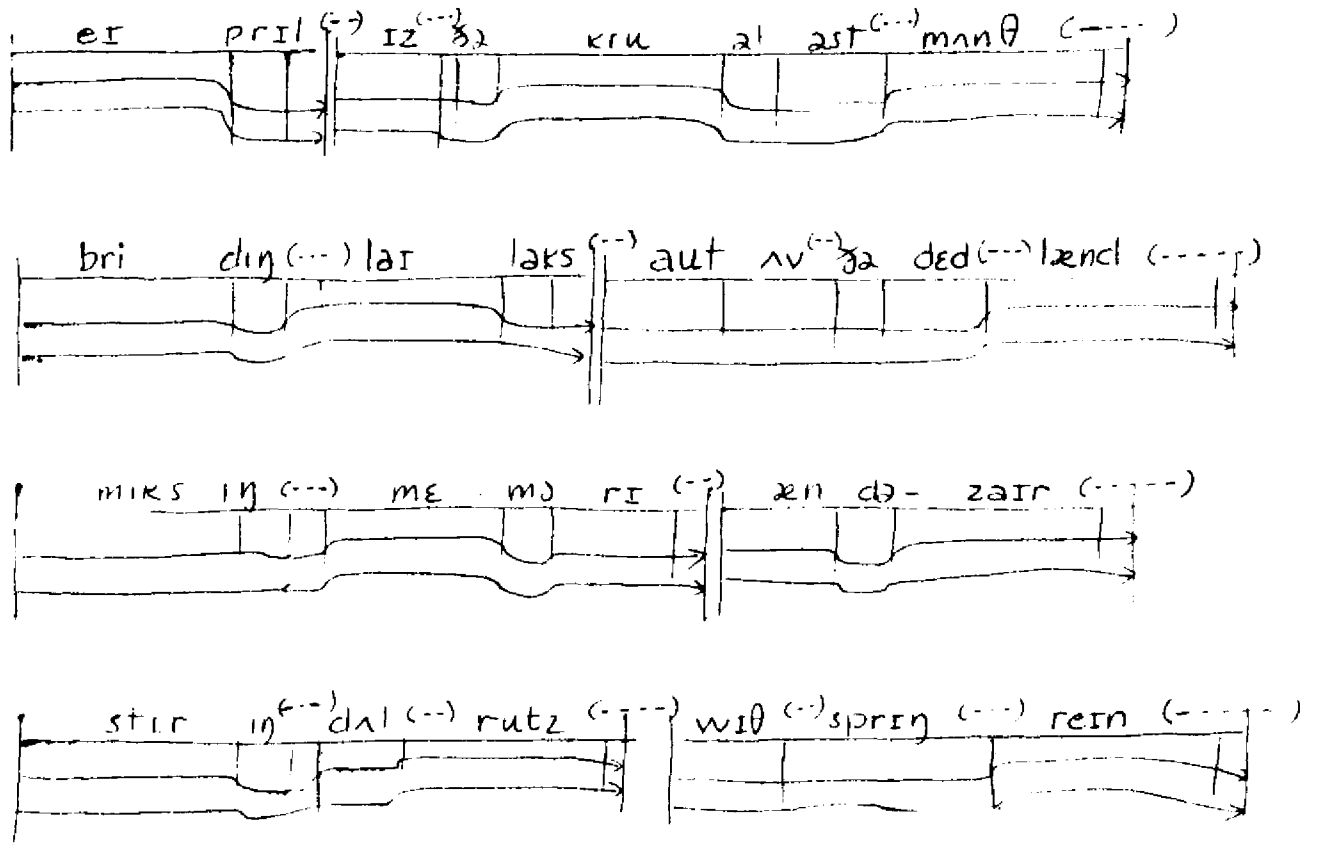
,

L	M	S
---	---	---

, or

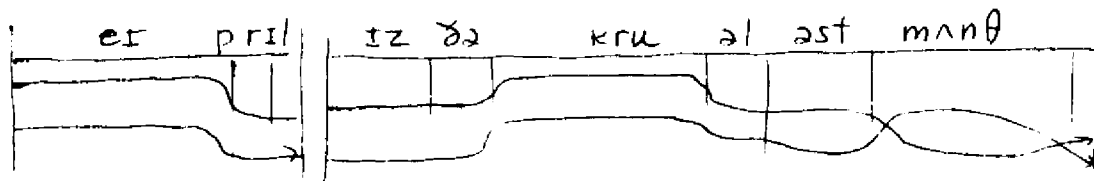
L	M	S
---	---	---

 and many other combinations. The Eliot is shown with the junctures of Row S-4N indicated and is broken into lines at these junctures.



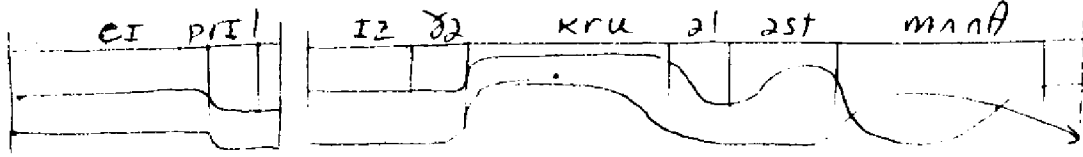
Pause potential does not disturb the basic grades of syllabic duration,⁴⁶ and for this demonstration Basic Strip, pitch and loudness are simply moved proportionately with the various degree of stress, but it is clear that the rhythms are consistent with reasonable English and also that interesting patterns appear for consideration. It might appear at this point that a long journey has been taken and that, useful as the grades of stress and duration potential might be, the resultant DPL

strip is merely a picture of what one "knew" in the first place. Perhaps it is, but there are guides for its formulation, and its main virtue lies in its usefulness as a basic strip against which variations can be played and through which the degree of variation can be judged, precisely because DPL components do have some independence of action. It is well known that pitch can drop as well as rise to signal stress, and Fry shows that duration alone can signal stress and that loudness can be omitted or minimal. All these variations can be employed in various degree, but as the degree of complication rises, as noted before, a level is crossed above which the attitude of the speaker comes into being and is added to the message. Above this dividing line experiments leave pre-prosodic basics and indicate performance particulars. But, for a brief illustration, the following strip of Eliot's first clause can be compared with the Basic Strip, and shows the kind of variations which can be experimented with:



Durations are not changed, but the last syllable of "April" is dropped in pitch, "is" comes in at a higher pitch level with small force, and "month" is dropped in pitch but loudness is kept up. For another particular performance the reader can add increased play to bring out irony, and is thus expressing his attitude that the words alone are not

sufficient and that the irony needs "bringing out" as the main point of the phrase. For example:



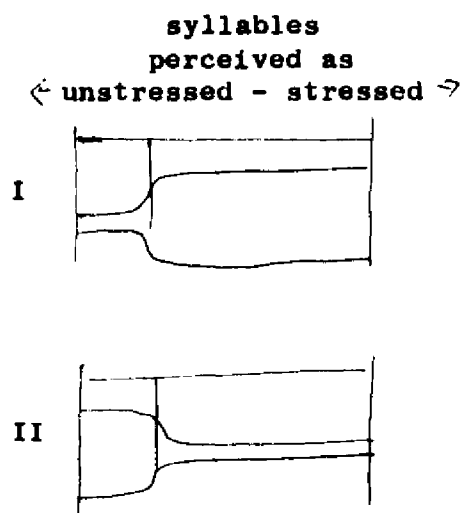
The first few syllables are kept flat so that the modulation in duration, pitch, and loudness on "cruellest month" can contrast. But some other reader might feel that the irony is overdone by such color and that flatness will convey it better, and he can express his attitude to the message even without altering durations. For example:



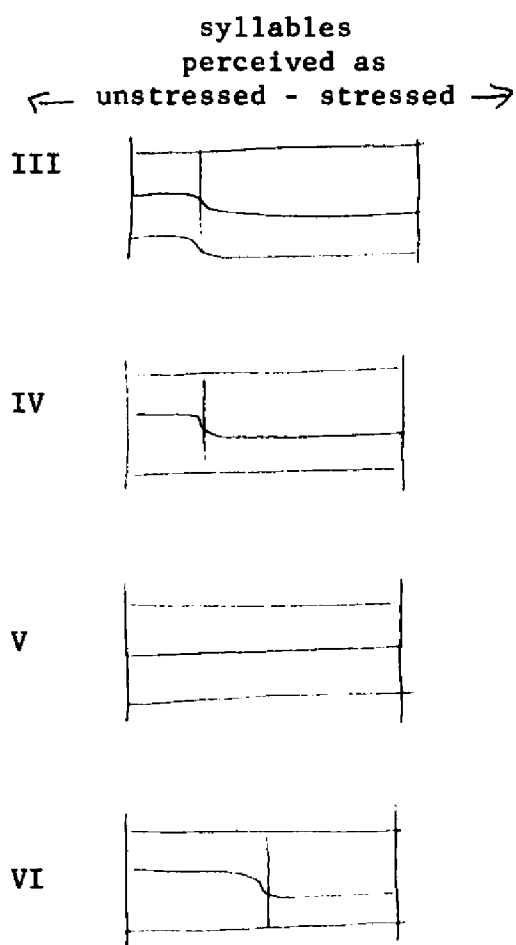
These examples show not only the range possible to the speaker, but demonstrate visibly by the amount of deviation from the Basic Strip the degree to which performance liberty is being taken. When metric patterns are experimented with, durations can, of course, be pushed around to conform, and again, the degree of deviation which may appear when an idea is carried out in a DPL strip may rouse caution or cause some pet hope to be discarded. DPL strip is an aid, therefore, for each of the three major divisions of my proposed system and can function as a basic guide, as the place to test score experiments, and as a detailed notation for particular performance. In it the "music" of poetry can be written and passed from scholar to scholar for argument and delight.

Independent control of pitch and duration may not be equally easy for all to perceive or to execute and some musical talent or experience is perhaps needed.⁴⁷ There are always some who can hear that there are modulations but find them evanescent in analysis and some who cannot hear pitch rises and falls or duration changes, and for that reason may deny that they occur at all much less independently and may assert much of the variations is irrelevant.

If all listeners do not easily perceive in which parameter movement is occurring in speech sound, it is a just question to ask if independent movement does in fact occur.⁴⁸ It does, and one of the most convenient and interesting places for the prosodist to see evidence in a form which is technical but not forbidding is in Chatman's A Theory of Meter, where he presents data on the duration, frequency, and amplitude of the word "compare" in eleven readings from a Shakespeare sonnet.⁴⁹ Not all of the possible combinations of the three parameters appear in the samples, but some of those perhaps most doubted do appear, and show clearly when translated to the general terms of DPL. (The numbers are not keyed to Chatman.)



In I and II pitch and loudness move in opposite directions in the stressed syllable,



In III and IV pitch falls with or without loudness drop.

In V duration is the only signal
It moves independently, loudness
and pitch remain level.

In VI pitch moves independently
since loudness is level and
duration has not increased,

Of course, in machine measurement it is clear that the continuum is in constant fluctuation. In the gross terms of DPL "level" pitch represents frequencies which have moved a small amount, since they are seldom truly level, and increase or decrease of loudness represents gross changes in amplitude, since it is a parameter very difficult to even estimate.

These examples demonstrate the place which data from performances of a poem can fulfill in a prosodist's study. Such data provide

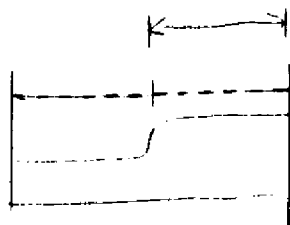
evidence that various physical events can and do occur in readings, but not evidence that certain events do not occur, since the samples are not sufficiently large. Nor do the data from performances of a poem prove that a single metrical theory is the "answer" to the poem, although the data can certainly indicate areas of agreement in contemporary interpretation, and can illustrate a theory in action. If the data from performances are submitted to judges, the data can act as a guide against which their perceptions can be checked, as Chatman here checks his own perceptions of sound.

These examples also demonstrate that there is some evidence of independent movement in the parameters of sound from syllable to syllable. Evidence that they all can move singly, in any pairs or together also lies in the work of E. A. Glikina (1958), whose experiments show accentual prominence created by all the combinations.⁵⁰ There are, no doubt, some inherent limitations in English; some of these combinations may not be possible in some sound contexts,⁵¹ but experimental work is not generally done with the aim of isolating independence of movement in the terms which DPL requires.

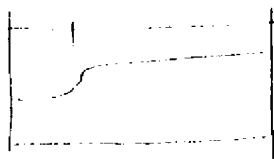
What does emerge, so far, from some data in regard to stress is that the ear can confuse parameters and that the least isolatable and dependable in human perception of stress is intensity or amplitude. For example, when duration and frequency were not changed and intensity was raised in one of Bolinger's tests, the intensity rises were heard as pitch rises,⁵² and Fry, as previously noted, finds duration a better cue than intensity.⁵³

Results shown in DPL show pitch and duration moving with greater effect than independent loudness. (Since these experiments were designed to measure relationship of pairs, the third parameter is generally held as level as possible, but published data are not thoroughly clear on this point. Therefore, dotted lines represent the component not under study.)

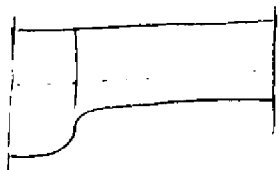
Syllable
perceived
as stress



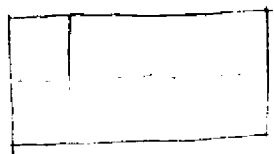
Pitch moves independently. (Bol.)



Pitch and duration co-variables⁵⁴

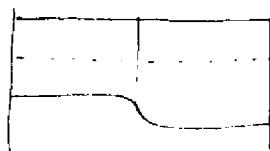


Duration and loudness can work together to signal stress. (Fry)



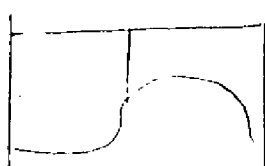
Duration alone can be a cue, thus can move independently. (Fry)

Syllable
not perceived
as stressed



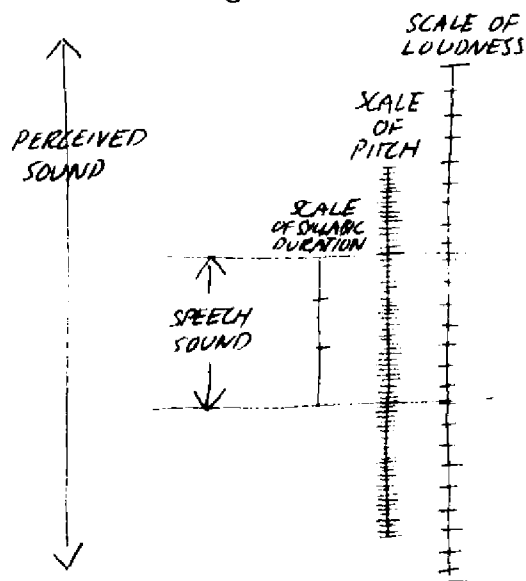
A drop in loudness alone does not signal stress. (Fry)

Syllable
perceived
as stress



Only when the loudness was raised greatly was loudness alone perceived as stress. (Fry)

In spite of the excellence of the experiments referred to here, they cannot be taken as final, since they were based in part upon synthetic speech, and a question yet remains about the precise relationship of synthetic to natural speech. However, it is clear that the prosodist can manipulate DPL components, as long as he does not depend heavily on loudness alone to create all the metric effects he is considering. In non-scientific terms the problem of the relationship of the three components can be represented by three scales set vertically. The kind of intervals which listeners distinguish are different on each scale, and pitch is the one which can be divided into the smallest degrees.



For the literary scholar who is not familiar with the complexities of the scales of frequency and amplitude and of calibrating them to scales of perception, Ladefoged presents a clear account of the entrance to a complicated subject.⁵⁵ But the scale of amplitude, physical and perceptual, of syllables is not worked out, first, because syllabic edges are sometimes difficult to establish, and second, because acoustic phonetic interest has been directed towards smaller components. The general sizes of syllabic durations, on the other hand, as well as their rough minimal and maximal limits are common background knowledge to researchers using spectrograms, but have not been systematically studied in terms suitable for the prosodist although useful data lies concealed in numerous experiments. The prosodist would greatly like to know, for example, how short or long one syllable in a particular context could be made and still be recognizable, and also at what range in the scale of increase it might move from perceived lack of stress to perceived presence of stress, both when other parameters are held level or added singly or as a pair. The same kind of experiment for each of the other components on the same syllable and context, if proper tests and controls can be set up, would be of great assistance.

Until such time as he is provided with more accurate and workable information and notation, the scholar at his desk can keep the basic DPL strip he has prepared of the poem beside the Basic Chart and complete the Chart by entering the three potential grades of duration above the syllable row, S-1, and entering the DPL insignia for the

major junctures. These entries complete analysis of the pre-prosodic as far as it is here proposed to dissect it, and the duration, stress, and pause grades, plus pitch movement at terminals, provide a pre-prosodic guide. A reading, still essentially a prose reading, could be made from it and would include the force of the line for pause and a basic rhythm which does not offend normal neutral English. The aim, however, is not to provide a chart for such a reading, but for the facilitation of uncovering sound repetitions and the prominences used in metrics for an eventual reading which includes metric pattern. Therefore, when the Metric Score is prepared, the summations of the Basic Chart are entered upon it. Before, however, a Score of patterns can be prepared for the exploration of metrics, the influence of sound repetition in refining the grades of stress potential needs consideration. In the next chapter this pre-metric influence on stress along with the patterns of tonality, the sound coloration of a passage, and the pre-intonation patterns of inherent vowel-pitch quality are explored.

Chapter III Footnotes

¹See, for example, D. B. Fry, "Duration and Intensity as Physical Correlates of Linguistic Stress," Journal of the Acoustical Society of America, XXVII (1955); Dwight L. Bolinger, "A Theory of Pitch Accent in English," Word, XIV (1958); H. Mol and E. M. Uhlenbeck, "The Linguistic Relevance of Intensity in Stress," Lingua, V (1956), 205-213; Ilse Lehiste and Gordon E. Peterson "Vowel Amplitude and Phonemic Stress in American English," Journal of the Acoustical Society of America, XXXI (1959), 428-435. Kenneth L. Pike lists older studies of stress in which stress is treated as complex, The Intonation of American English (Ann Arbor, 1945), p. 15, and Seymour Chatman summarizes experimental work on the complex nature of stress, A Theory of Meter (The Hague, 1965), pp. 43-52.

²There is a long tradition of those who feel stress involves the matter of syllabic duration. T. S. Omond gives a comprehensive list in "Appendix A," English Metrists: Being a Sketch of English Prosodical Criticism from Elizabethan Times to the Present Day (London, 1921), pp. 273-292. "Musical" prosodists describe stress in terms of precisely ratioed durations. For example, Sidney Lanier, The Science of English Verse," (Boston, 1880); Morris W. Croll "The Rhythm of English Verse," ed. Robert O. Evans in Style, Rhetoric and Rhythm: Essays by Morris W. Croll, ed. J. Max Patrick et al (Princeton, 1966), pp. 365-429; David Abercrombie, "Syllabic Quantity and Enclitics in English," In Honour of Daniel Jones, ed. David Abercrombie, D. B. Fry, P. A. D.

MacCarthy, N. C. Scott, and J. L. M. Trim (London, 1964), pp. 216-222. Some traditional views have long implied that loudness is compatible and associated with length. Sheridan Baker, a traditionalist, equates weight (stress?) and duration and finds "light and heavy as synonymous with short and long" and "absolutely congruent," "English Meter Is Quantitative," *College English*, XXI (1960), pp. 309-315. Critical statements are common, for example, that Elizabethan quantitative attempts were successful when "stress" coincided with supposed "quantity," and such statements imply length is not antagonistic to stress but can be coincident. Catherine Ing, for instance, says of Thomas Campion's quantitative experiment, "Rose-Cheekt Lawra," that "nearly all his long syllables have their length reinforced by the natural stress of English speech," Elizabethan Lyrics (London, 1951), p. 153. Of Sir Philip Sidney's quantitative experiments William A. Ringler, Jr. says that only in two did he "succeed in so ordering his syllables" that artificial quantity and natural stress coincide, The Poems of Sir Philip Sidney (London, 1962), p. 393. Association of two components in stress is, moreover, venerable in English poetry. Thomas Campion in his Observations in the Art of English Poesie (London, 1602) associates pitch rise with length and fall with brevity, implying that duration and pitch are components of the important or "accented" syllable of a word. "In words of two syllables, if the last have a full and rising accent that sticks long vpon the voyce, the first sillable is alwayes short, . . . Words of two sillables that in their last sillable maynetayne a flat or

falling accent, ought to hold their first syllable long, . . ."

unless, as Champion adds, the rule of position alters matters, Works, ed. Percival Vivian (London, 1909), p. 54.

³George L. Trager and Henry Lee Smith, Jr., An Outline of English Structure, SIL, Occasional Papers 3 (Norman, Okla., 1951), 7th repr. American Council of Learned Societies (Washington, 1966).

⁴Pike, Intonation, p. 11. "I am convinced that part of the difficulty in the analysis of phonemic degrees of stress is due to the failure to give sufficient weight to conditioning factors caused by intonation. . . ." Jones sees "extra length" as sometimes used to give "special prominence," The Pronunciation of English (Cambridge, 1950), p. 142.

⁵Ralph K. Potter, George A. Kopp, and Harriet C. Green (New York, 1947), p. 151.

⁶General Phonetics (Madison, Wisc., 1950), p. 228.

⁷Fry finds that duration influences judgment of stress more strongly than intensity, JASA (1955), and Bolinger finds pitch a better signal than intensity, Word (1958).

⁸Fry's experiment, JASA (1955), shows that when duration alone was increased on a syllable, judgments increased that the syllable was stressed, and Bolinger's experiment, Word (1958), shows that when pitch prominence alone was given to items in a sentence these items were heard as accented.

⁹The concept of contrast here is the physical one, not the phonemic principle.

¹⁰Even chickens can recognize relative contrast. Trained to avoid a black field and choose a grey, when given two greys, they chose the lightest, in an experiment by W. Koehler in H. Werner Comparative Psychology of Mental Development (New York, 1940), p. 216f., as reported by Roman Jakobson and Morris Halle in Fundamentals of Language (The Hague, 1956), p. 15.

¹¹The phonemic separation of the suprasegmental phonemes as in the Trager-Smith system into four levels of pitch and four levels of stress is misleading, and the various notations which employ the system compound the difficulty. Since stress and pitch are presented to the eye as if they were equivalent phenomena, an impression is created that each lies along a single scale physically, whereas they are unequal sets. Stress is a complex of three scales, one of which is pitch; pitch is a single scale. Both the phonemic degrees of stress and pitch pertain to syllables between terminal junctures in the Trager-Smith Outline, but in some studies pitch intonations can extend beyond junctures. For example, Archibald A. Hill states that "The pitch contour, defined as a sequence of pitches with only one peak, may extend beyond the boundary of a single phrase as it does in the sentence 'I think so,' said John," Introduction to Linguistic Structures: From Sound to Sentence in English (New York, 1958), p. 28.

¹²Peter Ladefoged, Elements of Acoustic Phonetics (Edinburgh, 1962), p. 79.

¹³See Peter B. Denes and Elliot N. Pinson, The Speech Chain: The Physics and Biology of Spoken Language (Baltimore, 1963), pp. 85-87,

on loudness and intensity. See also, Martin Joos, Acoustic Phonetics, Language Monograph No. 23 (Baltimore, 1948) and Gunnar Fant, Acoustic Theory of Speech Production (The Hague, 1960). The instruments used for experimentation in this field are constantly being improved. On the contour marking of intensity and other improvements of spectrograms see A. J. Presti, "High-Speed Sound Spectrograph," Journal of the Acoustical Society of America, XL (1966), 628-634. Chatman uses the Trans Pitchmeter and the Minograph ink-writer for "Some International Cross Currents: English and Danish," Linguistics, XXL (April, 1966), 24-44.

¹⁴Introduction to Linguistic Structures, p. 341.

¹⁵Morton W. Bloomfield and Leonard Newmark, A Linguistic Introduction to the History of English (New York, 1964), p. 79.

¹⁶Outline, p. 51.

¹⁷Kenneth L. Pike, Phonemics: A Technique for Reducing Languages to Writing (Ann Arbor, 1947), p. 50.

¹⁸R. H. Robins, General Linguistics: An Introductory Survey (London, 1964), p. 150.

¹⁹Daniel Jones, An Outline of English Phonetics, 8th ed. (New York, 1956), p. 281.

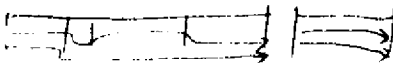
²⁰Jones, Outline, p. 284.

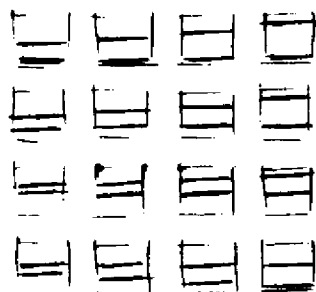
²¹Jones, Outline, p. 304.

²²Outline, pp. 44-49.


²³Introduction to Linguistic Structures, p. 24. Note also that Hill reports that acoustic phonetics bear out his "working formulation" of extension of sound at juncture.

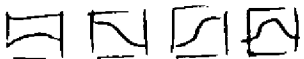
²⁴Trager and Smith give the set of "allophones" of terminal junctures and describe the phonetic data which are used here, Outline, p. 47.


²⁵Although the DPL strips are made large for purposes of exposition, they could easily be shown in a size that would fit transcription symbols set in 8 or 10 pt. type as  or the DPL strip could be even smaller and be a 10 pt. type itself for use without the transcription symbols for general discussions. It is also possible to keep separate given components from proposed components by solid and dotted lines. A type face designed for it need have no more characters than are available in any normal font. Standard square units, plus half and quarter units:



Pause: 

A few crossings: 

A few curving pitches: 

A few terminals: 

²⁶Hill gives values for pauses and juncture extensions which are included in the strip.

²⁷The Bloomfield and Newmark transcription uses /' / phrase stress and / / word accent. They use terminal phonemes /↑/, /→/, and /↓/, and symbolize disjuncture by space between letters. For a separation within a phonemic word group they use /- / juncture. The disjuncture and /- / juncture both lengthen preceding phonemes and strengthen following phonemes (pp. 76, 77). In the translation to DPL this slight lengthening is added and some loudness is shown for the accents.

²⁸The Trager-Smith Outline does not mention syllable durations and therefore durations are translated in the DPL as even squares. Pitch behavior is specified, however, at /| / as sustention, and at /|| / as rise. The characteristic is "movement . . . until terminal silence is reached" Outline, p. 46. Thus fall in force is implied and shown in DPL at the last syllable.

²⁹Pike does not show durations in his transcription, although he recommends getting from [°] to [°°], sentence stress to sentence stress, at regular intervals (Phonemics, p. 89) and he gives a list of his symbols and their meaning: [|] tentative pause, ['] innate stress, and four levels of pitch, shown by intonation contour (p. 45).

³⁰Robins follows Jones but does not use a center line in his pitch dots.

³¹Jones' dots show pitch and stress in an extremely convenient way, but since they are measured at the center of syllables and placed in accordance with fall of the transcription symbols, they do not show durations in a way convenient for metrics; they could probably be spaced, however, to show time relationships. Jones uses music

notation for rhythms.

³²George L. Trager, "Paralanguage: a first approximation," Studies in Linguistics XIII (1958), 4, 5.

³³Fry, JASA (1955).

³⁴See fn. 23 of this chapter.

³⁵Fry's experiments confirm this general trend, JASA (1955) and "Experiments in the Perception of Stress," Language and Speech, I (1958), 126-151.

³⁶Jones, Outline, p. 244.

³⁷Intonation, "In Teaching English to Latin Americans," pp. 107-117.

³⁸Outline, p. 237, pp. 242-243.

³⁹Intonation, pp. 109-110.

⁴⁰Intonation, p. 34.

⁴¹Yao Shen and Giles G. Peterson, Isochronism in English, Studies in Linguistics, Occasional Papers 9, 1962.

⁴²Abercrombie's musical solution is an attempt, "Syllable Quantity and Enclitics in English."

⁴³Intonation, p. 110.

⁴⁴See the work on vowel length, fn. 16 in Chapter II.

⁴⁵For convincing examples of varying syllabic lengths see Dwight L. Bolinger, Generality, Gradience, and the All-or-None (The Hague, 1961).

⁴⁶The pause potential is:

April (--) is (--) the cruellest (---) month (-----)

breeding (---) lilacs (--) out of (--) the dead (---) land (-----)

mixing (--) Memory (--) and desire (-----) stirring (---)

Dull (--) roots (----) with (--) spring (---) rain (-----).

In the DPL strip, pause potential of grades four, five, or six is represented by slight extension only if it does not coincide with the junctures of Row 4-N, by extension plus space for silence if it does. All junctures of Row 4-N are given terminal extension whatever the grade of pause and a double bar that shows a minimal silence and separates the DPL strips into phrasal sections. The remaining lesser grades of pause potential are indicated as absorbed in the syllabic duration since these potentials only become critical in some metrical problems.

⁴⁷Bolinger admits it is "hard to separate length from intonation" in performance and perceptual terms, but he provides a clear example in Generality, Gradience, and the All-or-None, p. 27.

⁴⁸Bolinger regards pitch and duration as being independent of each other. "The criss-crossing of contrasts of length, pitch, and intensity are so complex that it is no wonder we are tempted to throw them all together, but I believe that length operates independently and that when, for example, a pitch contrast occurs with added length, it is not one thing happening but two," Generality, p. 25.

⁴⁹Chatman gives acoustic data which include duration for a foot from "Shall I compare thee to a summers day?" A Theory of Meter, pp. 162-166.

⁵⁰As reported by Bolinger, "A Theory of Pitch Accent in English," 114.

⁵¹Elizabeth Uldall, testing one sentence with synthetic intonations imposed upon it, found that listeners judged weak syllables

which rose above strong in pitch as "unpleasant" except in yes-or-no questions with end rises. "Attitudinal Meanings Conveyed by Intonation Contours," Language and Speech, III (1960), 223, 234. Her work suggests that certain combinations may not be probable in some grammatical contexts. Bolinger lowered intensity at pitch-marked stresses and found listeners "preferred" no addition of intensity to high addition, and preferred minimum and small to high. "On Intensity as a Qualitative Improvement of Pitch Accent," Lingua, VII (1958), 175-182. This preference suggests there may be generally "felt" limits to the independence of loudness as an element of stress.

⁵²Bolinger, "A Theory of Pitch Accent," 122-124.

⁵³See fn. 7 of this chapter.

⁵⁴Bolinger does not mean at all times, but that during a pitch accent the duration is there "in order to make room for the accent," but he states he "would not say that duration has no other function;" "A Theory of Pitch Accent in English," 138.

⁵⁵Elements of Acoustic Phonetics.

Chapter IV

Pre-Metric Patterns of Sound Repetition

The prosodic step of the system consists of two parts, pre-metric patterns and metric patterns. The metric patterns are taken up in the next chapter, and in this chapter pre-metric patterns of sound repetition are discussed.

In traditional prosody patterns of sound repetition are considered as supplements to metrics but are often noted as post-metric appurtenances, that is, as aids to support a metrical theory already selected. It is the premise here, however, that when patterns of sound repetition are first thoroughly explored at a pre-metric level, the question of their later relevance to metrics is clarified. Some patterns of sound repetition have no metric function, but some do affect stress grades slightly and thus have a small eventual metric function. Thorough exploration sorts patterns into class by function. For those kinds which do exert weight on metric pattern, thorough pre-metric analysis supplies a more just evaluation of that influence than any fragmentary post-metric notice, invoked only at points of dispute, can supply.

Patterns depend upon repetition and there are two classes of pre-metric patterns, each of which, in turn, can be subdivided into two kinds. The first class, those which have a musical function, is explored in Part I of this chapter. Musical patterns are of two kinds: the cumulative tonalities and the sequential vowel pitches. The

second class, those which have a supportive function, are taken up in Part II of this chapter and are also of two kinds: the simple pairs, series, and echoes and the positioned pairs and series such as alliterations. Both classes, musical and supportive, contribute to the unity of the work, but the positioned repetitions work particularly to support the unity of the passage which they bridge.

Musical patterns, the first class of repetitions, do not have specific metric function; they create the musical environment of tonality and melody in which the pulses and movement of metrics occur. They are pre-metric, however, rather than merely pre-prosodic, because notice of any pattern of sound for its beauty or music alone, apart from its function in syntax or as a semantic signal, is traditionally a part of prosodic concern. But they are not metric, because they can be explored before any metric theory is attached to the selection. The first or cumulative kind of musical pattern is the summed frequencies of vowels and consonants and has no metric function but shows the key or tonality of a selection, the total tone quality, the color.¹ For example, in "dull roots with spring rain," the vowels are all central or high and [r] and dental consonants predominate. Passages differ in tonality. For example, in "clouds their storms discharge" vowels are lower, [s] predominates, and both affricates are present. The second or sequential kind of musical pattern is the sequence of inherent vowel pitches. Such pitch sequences have no metric function but trace out various distinctive

tunes. For example, the sequence of vowels in "dull roots with spring rain"

[^ - u - I - I - eI]

has a sequence of internal pitch relationships which is very different from that of the vowels in "clouds their storms discharge."

[au - ε - ʊ - I - a]

Each creates a different effect to the listener and suggests different sensations in the mouth and throat.²

Supportive repetitions, the second class of pre-metric sound patterns, have occasional metric function and support the unity of the passage in which they occur. Supportive repetitions are also of two kinds. The first kind are "horizontal," or simple brackets or series of recurrences which support internal structure by reinforcing the strength of the passage which they bridge.³ For example, the [rI] of "April" and "rain" in the Eliot, bracket almost the entire sentence and create an echo that ties beginning and end, yet the [rI]s do not have important positions such as an alliteration has, and the first is in a syllable which has no pre-prosodic stress potential, whereas the second is in a syllable which does. The bracket supports structure but does not of itself create great phonetic noticeability for the syllables in which its members occur, although it does contribute slightly to such prominence. The second kind of supportive repetitions have both rhythmic and occasional metric function. They are the "vertical" coincidence of members of sets of repetitions with positions of structural importance, that is, the coincidences of

brackets or series with stresses, or with other strings at any particular point.⁴ For example, the [aU] in "hours" coincides with the beginning of syllable and word units, with stress potential at every S-row, with the repetition [aUarz] - [taUarz], and the close repetition [ɔ̄ɛraUarz] - [ɔ̄ɛIrɪtaUarz]. The heap of connections is sufficient to increase the grade of stress potential of the syllable. This adjustment of stress grades is not post-metric, an element laid on after metric decision, but is pre-metric, an element that creates metric decision because it provides support for strongly marked syllables which in turn support English metric theory. But these supportive kinds of repetitions also need thorough rather than sporadic notice, and therefore in Part II they are explored and their metric weight evaluated.

Part I

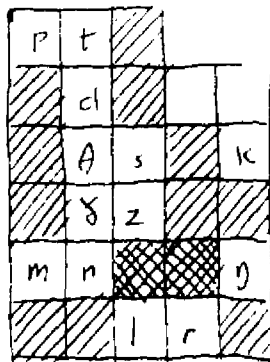
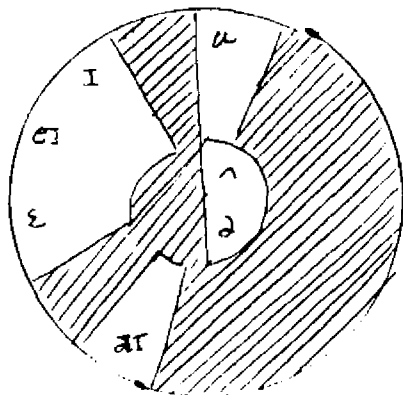
Musical Repetitions

The cumulative and the sequential repetitions have musical function, and tonality is the name here given to the first. It is the premise here that the patterns of distribution in the sums of the frequencies of individual sounds in short passages of verse create a tonal atmosphere; that the poet exerts some control by concentrating these dominances of certain sets of sounds over others;⁵ and that measurement of their frequency in terms of the passage reveals how various passages contrast in tonal pattern and how the tonality can suggest echoes of meaning in diffuse ways.⁶

Some fluctuation of tonality is inherent in the nature of the language medium but it may be more concentrated in poetry, and both poet and critic assume it can be⁷ and that precisely as the artist can color-tone his picture or some section of it by mixing a little yellow in every stroke, so can the poet introduce some sound or group of sounds into every phrase. Thus the poet can direct a natural variation into particular directions. He can make the fluctuation of overall sound from section to section more intense and of greater sharpness and frequency than it would be in casually spoken speech or in ordinary prose sections of comparable size. In ordinary prose tonality seems diffused and flattened. Certainly Paradise Lost, in toto, would reveal much the same count as any other sampling of English of such size, but all small patterns merge as one steps far enough back, just as spoken language becomes a murmur at a distance. Here it is proposed to step back only far enough to see the pointellism of the vowels and consonants merge into sections which both structure and tone the verse painting, but not so far that the sections are merged.

In order to keep this phenomenon of tonality accounted for and to see what sections in a poem may be creating patterns of repetition and contrast in tonalities, a frequency count for a section can be shown in a "phoneme key" which tabulates the palette of sounds for the section in a graphic way which makes comparisons easy.

The phoneme key is shown on two little insignia which chart the basic sounds roughly by place of articulation.

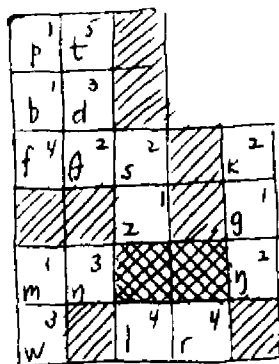
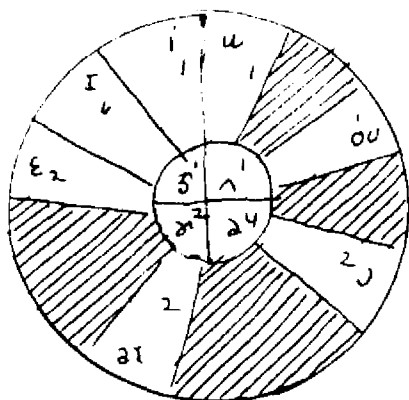


For the sake of comparison another comparable section can be examined. The next three lines of the Eliot, since they are a sentence, are a convenient and logical section to examine.

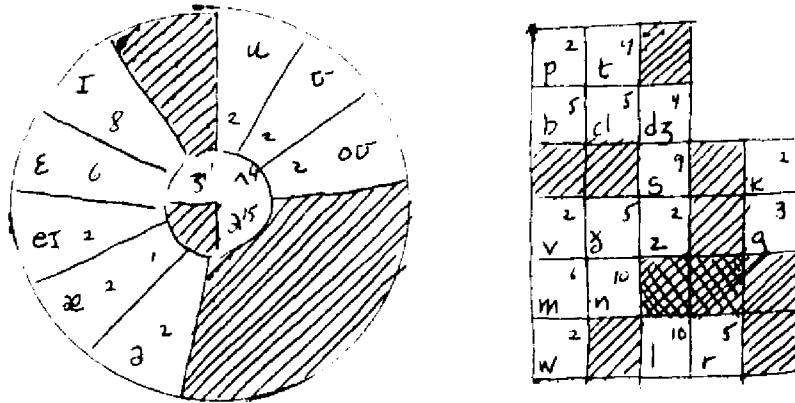
Winter kept us warm, covering
 Earth in forgetful snow, feeding
 A little life with dried tubers.

[wintəkept us wɔrm kʌvərɪŋ sɪθ In fə'getfəl snəʊ fi:diŋ ə lɪtl lɑ:lf wɪð draɪd tʊbɜ:z]

FREQUENCY



Used more
than once

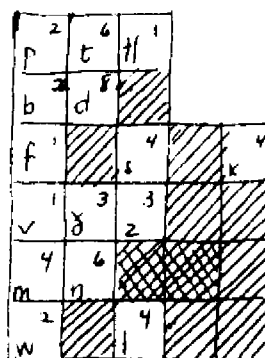
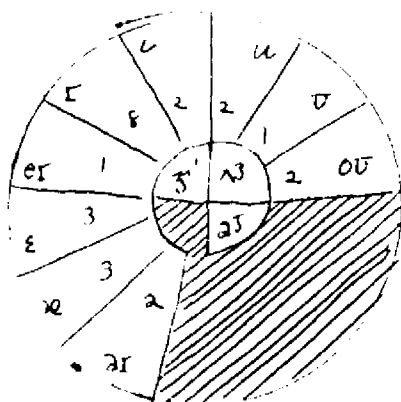


The vowel and diphthong distribution is wider, more diffuse, and the number of front consonants much greater than in the poetry. What was expected has happened. There is a more concentrated tone in the poetry.

To show that the difference continues, several more lines of Eliot's prose and poetry are keyed for tonality. Eliot's next prose sentence does not include the various names which limited his choice in the first prose lines, so that he has more freedom. Since this sentence, however, is much longer than the four verse lines, it is keyed in two sections for phonemes used more than once.

Indeed, so deeply am I indebted, Miss Weston's
book will elucidate the difficulties of the poem
much better than my notes can do;

[Indid sou dipli æm aI Indetəd mIs westənz bUk wIl əlɪsɪdeɪt ðə
dɪfɪkəltɪz w ʒə poUm mətʃ bɛtɜ ʒm məI nouts kæn du].



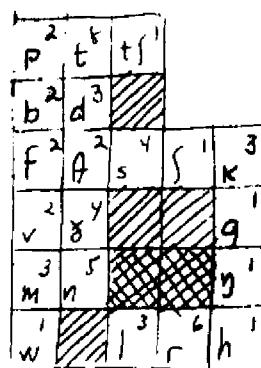
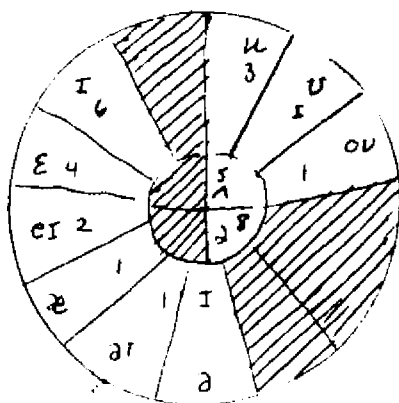
The vowels again are different but more widespread than in the poetry. Consonants differ in the loss of [r] and [g] from the first prose, and the open first row, like the other prose, differs from the poetry.

The prose continues:

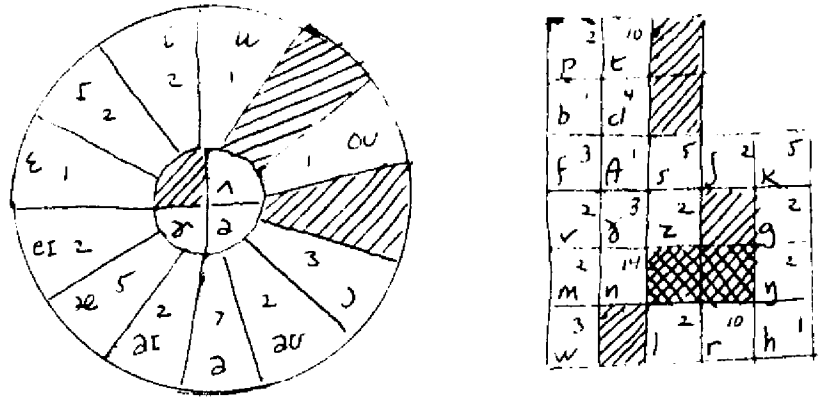
and I recommend it (apart from the great interest of the book itself) to any who think such elucidation of the poem worth the trouble.

[and aɪ rɛkəmɛnd ɪt əpɑːt frəm ðə greɪt ɪntərəst əv ðə bʊk ɪtsɛlf tu ɛni hu θɪŋk sʌtʃ əlʊsɪdeɪʃən əv ðə poʊm wɜːθ ðə trəʊbl.

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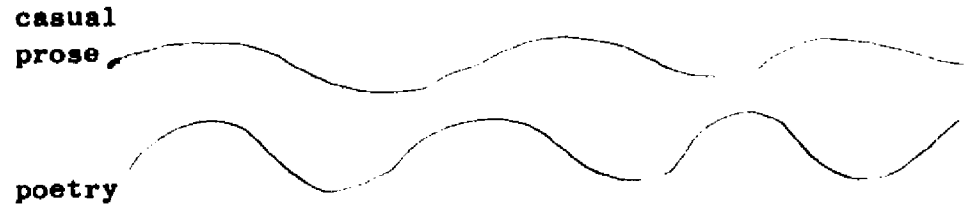


[sʌmð səprəʌzd əs kʌmliŋ ovər ðə stərnberɡərteɪ wið ə ʃaʊər w reɪn wi
 stəpt ɪn ðə kələnfeɪd ænd went ɒn ɪn sʌnleɪt ɪntu ðə hæfɡɑ:rtən ænd
 drɔ:ŋk kafi ænd tɔ:kt fɔ: ænd hæʊr]



These lines show a complete change. They differ from the prose and the previous samples from the poem. There are more vowels and more back vowels than in any other key and also more repeated diphthongs. A new heavy voice has entered.

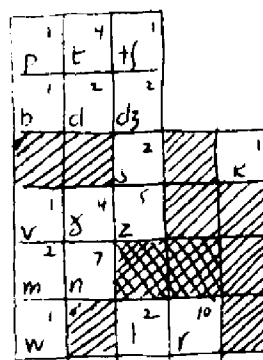
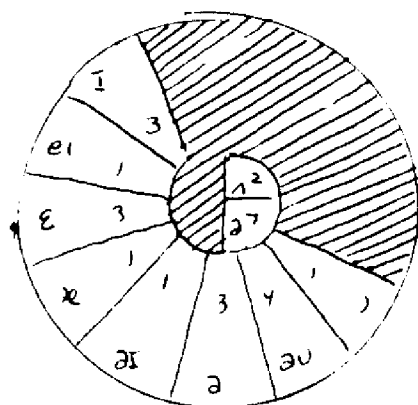
Such sampling is too small for proof, but does suggest that the variation from section to section in prose may be, as suspected, less definite, less patterned than in poetry. Perhaps tonality changes in prose do describe a flatter more diffused curve than in the poetry.



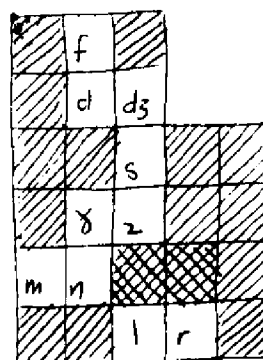
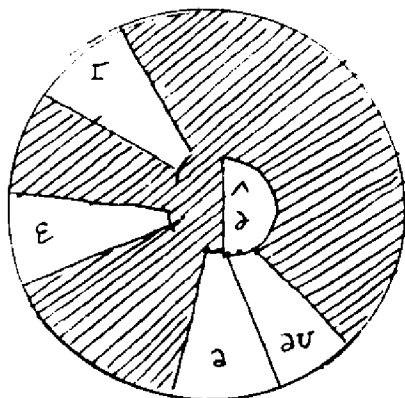
Eliot's prose and poetry differ in amount of diffuseness or sharpness of tonality, and comparisons with samples of prose and poetry from Campion's work continue to support the difference.

The phoneme keys for the first four lines of the Campion selection show a patterned distribution.

FREQUENCY



Used more than once

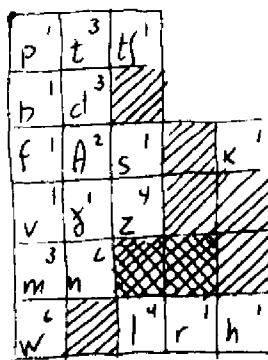
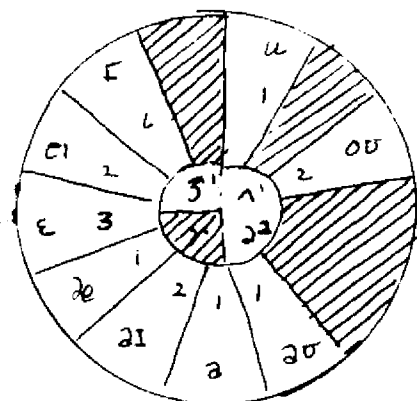


It is noticeable at once that the vowels are fine for singing. The fine open-throated singing vowel "ah" is predominant and the other repeated vowels are the [I] and [a, e, aU] for which the facial muscles can be relaxed. Lip closures which cut off sound are avoided, and only the humming "m" is used more than once. The guttural back stops and empty, breathy consonants are avoided, stops are far outweighed by continuants, which permit air flow around the tongue, and un-voiced consonants are outnumbered by the voiced, which permit vibrations to continue. The sounds are pleasantly fit for open, easy unhurried singing, and the poem is, after all, a song. The Campion differs strikingly from the Eliot, and in the next few lines continues to show concentration rather than diffusion.

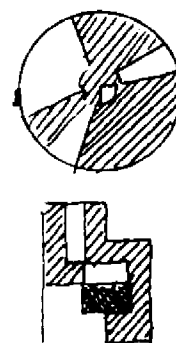
Let now the chimneys blaze
 and cups o'erflow with wine,
 Let well-tun'd words amaze
 With harmonie diuine.

[lɛt naʊ ʒə tʃɪmniːz blaɪz ænd kʌps oʊrflaʊ wɪθ waɪn lɛt wɛltʊnd wɜːrdz
 əmeɪz wɪθ hɑːməniː diːvaɪn]

FREQUENCY



Used more
 than once



It can be seen that tonality has shifted, but interestingly is related to the first lines. The vowel span has changed by a narrowing within the same span, not by introduction of new. The next four lines also show patterned restrictions.

Now yellow waxen lights

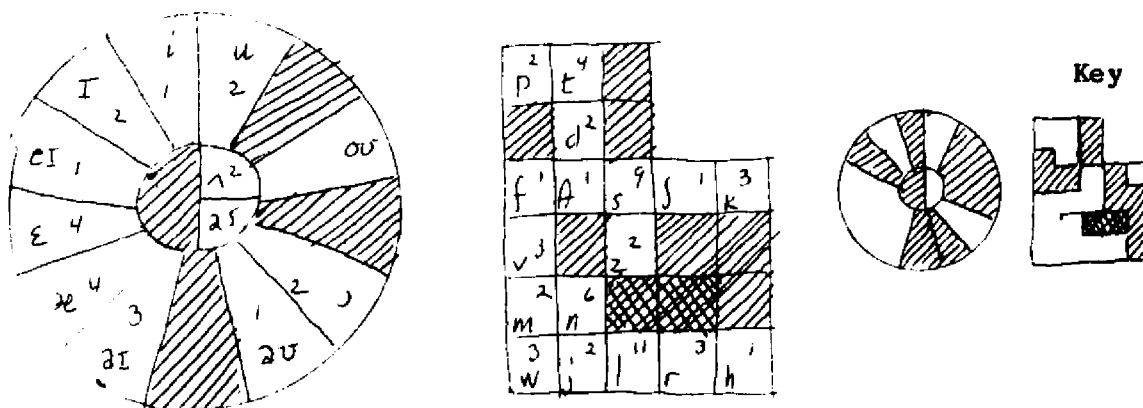
Shall waite on hunny loue

While youthfull Reuels, Masks, and Courtly Sights,

Sleepes leaden spels remoue.

[naʊ jəlo wɔksɪn laɪtɪz] (ɔl weɪt ɒn hʌnɪ lʌv waɪl juθfʊl rəʊvəlɪz
mæskɪz ænd kɔrtli saɪts slɪps lɛdən spɛlz rəmu:v.

FREQUENCY



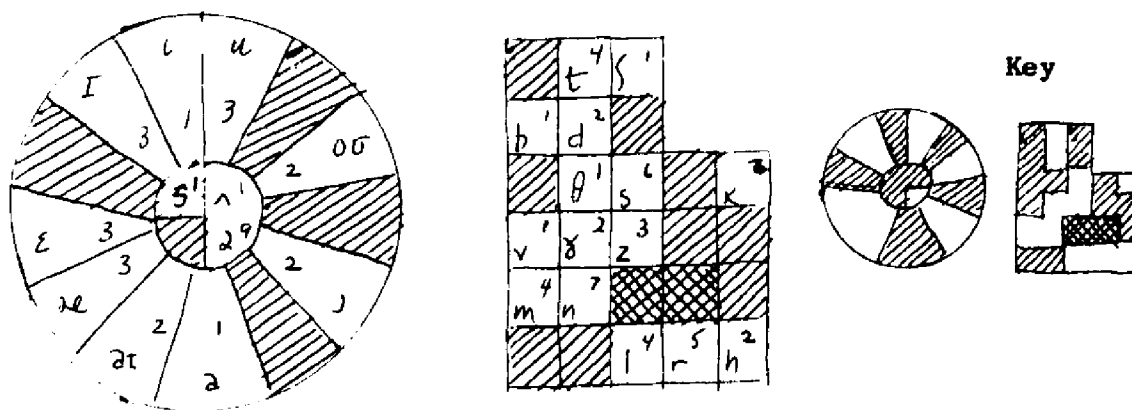
There is expansion to other vowels but the tendency remains to retain lax vowels. The Champion lines have a high [1] coloring, whereas the Eliot do not, and none of the Champion keys resemble the keys of The Waste Land lines, although they both show a more patterned or limited distribution than Eliot's prose. What of Champion's prose?

There are samples of the Campion's prose in various dedications and in his Observations on the Art of Poesie, and A New Way of Making Foure Parts in Counter-Point... For comparison, a passage is selected where he, too, is acknowledging a source and is therefore limited by proper names and where he is direct and is neither composing self-conscious dedicatory prose, nor prose so technical that special terms dominate the passage.⁹

Of all the latter writers on Musicke, whom
I haue knowne, the best and most learned,
is Zethus Caluisius a Germane;

[ʌv ɔl ðə lætə raitəz In muzɪk hʌm əl hæv nɒʌn ðə best ænd moʊst
ɪz zethʊs kəlʊsiʊs ə dʒɜrmən]

FREQUENCY

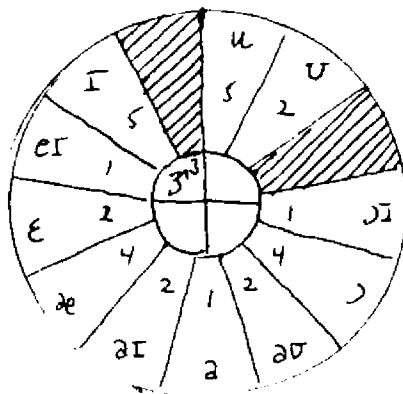


The passage continues:

who out of the choicest Authors, hath drawne into a
perspicuous method, the right and elegant manner
of taking all Concordes, perfect and imperfect, to whom
I would refer our Musitions,

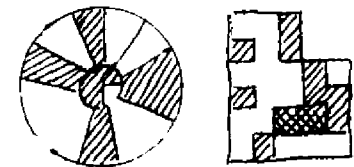
[hu aUt av ða t/oIsast ðurz hæð drøn Intu a pærsipikuas meðad ða
 raIt ænd elagant mænr av teikIy ol kankordz p'fækt ænd Imp'fækt tu
 hUm al wUd ræf's aur muzI{anz}]

FREQUENCY



p	t	f	h	1
q	d	l	6	1
f	A	5	4	1
v	ð	2	4	1
m	n	6	2	1
w	1	1	2	1

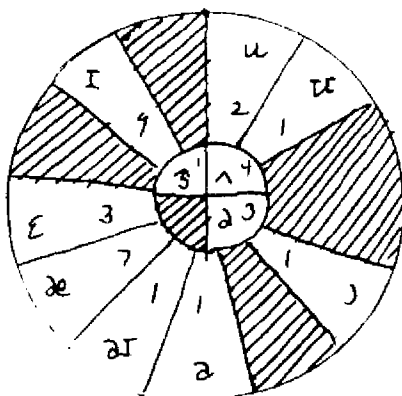
Key



but that his booke is scarce any where
 extant, and besides it is written in Latine,
 which language few or none of them vnderstand.

[but ðæt his bUk Iz skærs ænI w'æktænt ænd blsaldz It Iz ritæn In
 lætan wItI længuadz fJu or nan av ðem andarstænd]

FREQUENCY



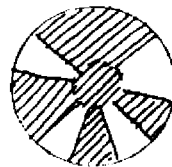
t	f	h	1
b	d	4	1
f	1	5	1
v	ð	2	4
m	n	10	1
w	1	1	2

Key

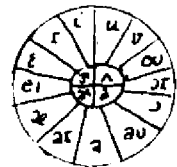


Distribution in all the Campion prose is wider than in the verse, and, as far as these few experiments with phoneme charts can demonstrate, the expected trend to clearer bunching in the verse, greater spread in the prose is supported. Much more experiment might reveal some standard combinations, but it is clear that there are several basic possible significant keys. If the keys are split in half or fall into some kinds of blocks, there is a contrast to a general scattering, but vowels and consonants have long been classified as members of various kinds of sets, and if any one or two sets are predominant in the phoneme keys, a special kind of coloration or tonality is occurring which has long been noted in criticism but requires a long paragraph of description to explain. If in a selection the sounds are predominantly high, front, dental, they have a very different tonality from a selection where predominance is low, back, nasal, or is mid, lax, and labial, and keys drawn up in perfect sets provide reference keys against which any key of a particular passage can be matched for quick description. Vowels can be sorted into such groups as:

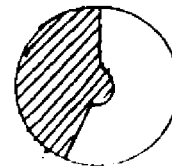
Vowels and diphthongs



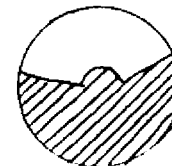
key
wheel

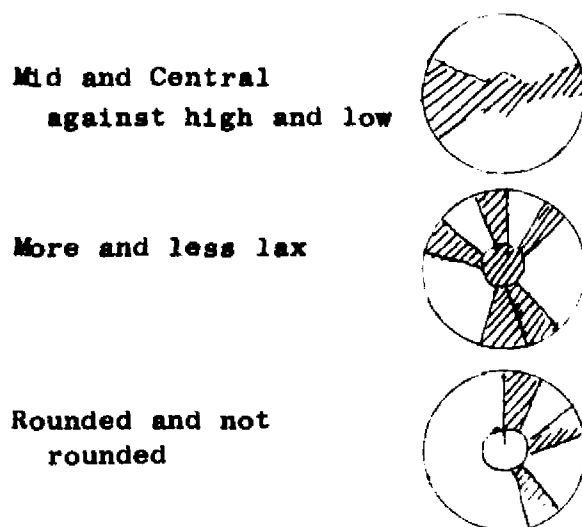


Front and back



High and low
(not pitch, but position or articulation)





On any Basic Chart, or anywhere, a phoneme key of such pattern would quickly indicate the extent and kind of pattern in the selection.

The consonants can also be classed in various sets to provide a convenient critical tool for the description of tonality. Some common ways of classifying by function, characteristic, or place of articulation are:

Stops	p b t d (tʃ dʒ) k g
continuants	f v θ ð s z l ʃ ʒ m n
breathy	w h j
liquids	l r
fronts	p b f v m j t d θ ð
centrals	s z tʃ dʒ ʃ ʒ l r w
backs	k g ŋ h
fricatives	f v θ ð s z ʃ ʒ and affricates tʃ dʒ
sibilants	s z tʃ dʒ ʃ ʒ
labials	p b f v (m)
dentals	t d θ ð (f v)

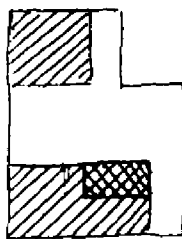
or consonants in general can be classed in large groups:

voiceless	p t k tʃ f s θ ʃ										
voiced	b d g dʒ v ʒ z ð										
vowel-like	<table border="0"> <tr> <td>m n r l</td> <td>y w h</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td colspan="2">} often</td> </tr> <tr> <td colspan="2">} semi</td> </tr> <tr> <td colspan="2">} syllabic vowels</td> </tr> </table>	m n r l	y w h			} often		} semi		} syllabic vowels	
m n r l	y w h										
} often											
} semi											
} syllabic vowels											

Clearly, if any passage predominantly uses one of these large classes or, what is more likely, several smaller sets, a certain special coloration is achieved for which reference keys are convenient.

A few representative examples are given:

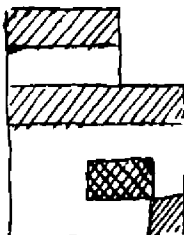
**Backs and fricatives
(and affricates)**



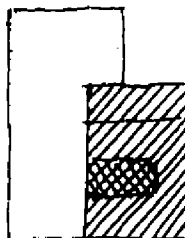
**Consonant
Key**

p	t	tʃ		
b	d	dʒ		
f	θ	s	ʃ	k
v	ð	z	ʒ	g
m	n			ŋ
w	j	l	r	h

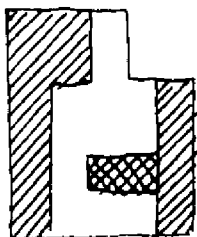
**Voiced, nasals, and
semivowels**



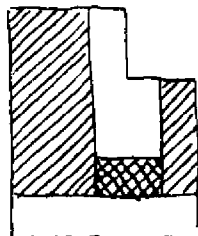
Fronts, labials, dentals



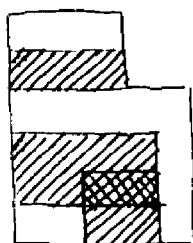
Centrals



Sibilants, breathy, and liquids



Voiceless and backs



Finding the patterns in the cumulative frequencies of single sounds shown by the phoneme keys is one way in which tonality can be examined, but since intervocalic groups of consonants occur and contribute to the character of the general sound, their characteristics and cumulative properties can also be explored. They give the tonality its timbre.

Attention has traditionally been given to alliterative clusters and clusters at rhyme; also, the cumulative effect of initial and

final clusters of works has been touched on.¹⁰ Such study is not of cumulative quality alone, however, but rather of another type of sound repetition, that in which the function supports structure and the members of repetitions intersect with structural position. Here, however, the sequence of intervocalic clusters can be investigated without reference to syllable, word, or any other structural position.

For the Campion and the Eliot, Row S-3 on the Basic Charts has already shown the property of the clusters to join or break internally or from preceding or following vowels, and these breaks are shown in the abstracted lists by slants. Where major pause intervenes it is listed as a break.

Campion		Eliot	
[nt	/kl	[pr	nd/m
r/n	dz/ʒ	z/ʒ	ŋ/m
ts	r/st	kr	nd
n/l	rmz/d	st/m	r/st
rdʒ/ʒ	s/tʃ	nθ/br	ŋ/d
mb	rdʒ/	ŋ/l	l/r
v/ʒ	n/ʒ	ks	ts/w
rs/ʒ	rz/]	v/ʒ	θ/spr
		d/l	ŋ/r]

The Eliot has a few more, but it is only when the groups are packed together to make connections visible or sorted by sets that the entirely different timbre is clear. The clusters are grouped

into as tight a block as possible by generally keeping predominant single sounds aligned vertically and echoing groups horizontal:

[ts	[z
	st		v
	rst		stm
	rz, rz		rst, ts/w
	rdʒ		nʃbr
	rdʒʃ, rmzd		ʃspr
	dzʃ mb		pr
	vʃ		kr, ks
	nʃ		lr, dl
	nt		ʃl
rn, nl, kl]			ʃr, nl
			ʃm, ndm
			ʃd, nd]

All of the Campion clusters are interrelated, but there is an isolated pair in the Eliot, and when the groups are sorted into articulatory sets as groups, the contrast between the two selections is seen even more sharply than in the consonant phoneme keys. One possible large division, for example, is into voiced and unvoiced clusters.

	Campion	Eliot
All voiced	[vʃ, dzʃ	[zʃ, vʃ
voiced with nasals, laterals	rz, rz, rdʒ, rdʒʃ, nʃ, rmzd, mb	dl, ndm, ʃd, nʃbr, nd
unvoiced with nasals, laterals and w, h, j, or all laterals or nasals	nt, nl, kl, rn, rst	tsw, pr, kr, lr, ʃr, ʃl, rst, spr, stm, ʃm
All unvoiced	ts, st]	ks]

The timbres of the two selections are almost entirely different.

The number of Campion's voiced consonants in his mixed voiced

clusters is greater than in Eliot's. In the entire groups only [vʃ], [zʃ], and [rst] appear in both selections. However, [vʃ] and [zʃ] are of common occurrence in English. [vʃ] appears in such ordinary combinations as "of thè" and "have the," and [zʃ] occurs in voiced plurals followed by such common words as the, them, their, this.

The patterning of the phoneme keys and the clusters for the Eliot and Campion differs and shows that first impressions of tonality are supported by details. The impression that the Eliot sound is dry, precise, thin, deliberate, edged, not "pretty" is supported by the combination of high front vowels and consonants which are either at the teeth or back in the throat. The impression that the Campion has a round, full, flowing, slow sound is supported by the open vowels and the avoidance of lip closures, and of guttural and breathy consonants. Continuants permit air flow around the tongue, and voiced consonants permit vibration to continue. The physical feel of the Eliot is front tightness, high speaking at the teeth.

Few phoneme keys or cluster analyses will form distributions of pure sets, but some will approach them, and any that do, indicate a passage which must have some dominant physical feeling for the person uttering it. It feels different to articulate at one section of the voice tract more than at another. These sensations suggest that the tight, high feel of the Eliot fits the didactic syntax, the projection of an insistent voice,¹¹ and that the easy physical sensation of the Campion fits the whole impact of the poem, the sense of light, love,

revelry within, while winter, night, and storm are shut out. Perhaps it is partly this sense of easy articulation which makes the talk of night, storms, clouds, arouse no sensation of distress.

It is possible that a poet can employ passages of contrasting tonality and timbre to support and convey general impressions of contrast in mood and meaning. In Cymbeline, for example, the king and queen contrast, and Shakespeare seems to extend their difference of character into a contrast of tonality and timbre in their speech.

Cym. Thou foolish thing!--

They were again together; you have done

Not after our command. Away with her,

And pen her up.

Queen. Beseech your patience. Peace

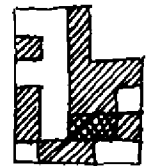
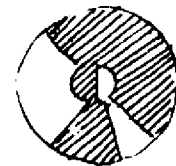
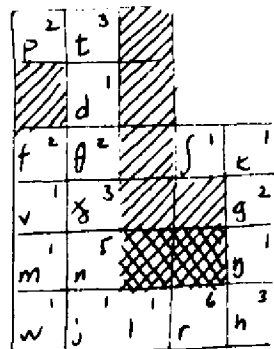
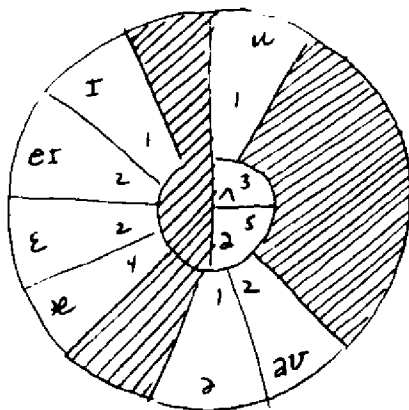
Dear lady daughter, peace!-- Sweet sovereign,

Leave us to ourselves, and make yourself some comfort

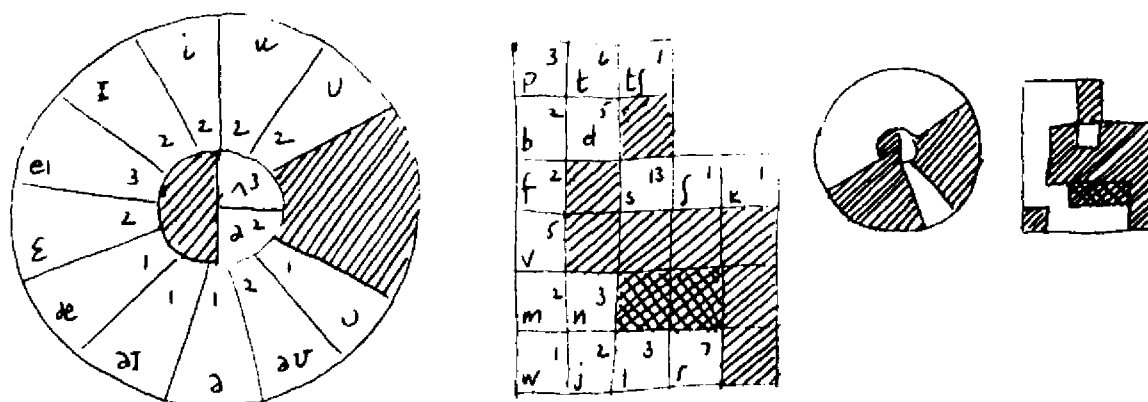
Out of your best advice. (I, 11, 80-87)¹²

The phoneme keys show strong patterning, with the queen's words high, front, the king's more lax and back.

The King



The Queen



Contrasting pattern of presence and absence in any keys can always be examined in further detail by comparing density in the frequency counts. For the king and queen what is predominant in one voice is startlingly recessive in the other. When those scores which are the same or which are present in both but only differ by one are cancelled out, the remainder show the general contrast carried out into frequencies.

The king has no [i], [u], [b], [s], and few [v], [d], [t].

but the queen has 5 [i], 2 [u], 2 [b], 13 [s], 5 [v], 5 [d], 6 [t].

The queen has no [θ], [ʒ], [g], [h], and few [ɛ], [æ].

but the king has 2 [θ], 3 [ʒ], 2 [g], 3 [h], 6 [ɛ], 4 [æ].

It is not surprising that differences of distribution suggest differences in character to the listener. It is not surprising that he might seek to connect the type of tonality to the type of character. He might say that for all the king is uttering commands as befits his

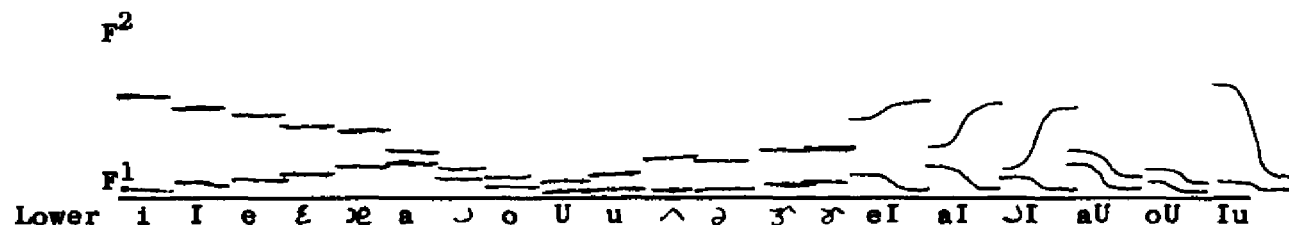
position, he is using breathy, alveolar, and back consonants which, along with much lax [ɛ] and [ɐ], suggest his own slackness of observation, lack of acuteness. And the queen's articulation for all her soothing words, is high, tense, front, and loaded with [s] which suggest her own sharpness and therefore her duplicity. Tonality, the result of the first kind of pre-metric pattern with musical function, creates a musical color through cumulative frequencies, suggests mood, and tends sometimes to rouse fleeting connections to details of meaning.

The second kind of pre-metric pattern with musical function is the sequential fall of the inherent relative vowel pitches. These sequences form what are here termed tonality tunes to distinguish them from the large sweeps of pitch which cover phrases and are called intonation contours. Tonality tunes lie in the quality of the vowel and are therefore fragile and tiny patterns of pitch, a faint music which nevertheless is heard and contributes to the effect of a poem. The inherent pitches of the nuclei, however, have relative intervals as spoken by any one person, and the fluctuation of rising and falling, delicate as it is, forms small modulations and can contain designs of repetition such as the [eI, I, I, ɔ]; [ʌ, i, I, aI]; [aI, I, I, ɛ]; [aI, I, I, ʌ]; [u, I, I, eI] series of the Eliot. The first begins in "April," the next three contain the participles, and the last ends in "rain."

Traditional criticism is full of remarks about particular control of vowel music in certain verses, and though few would deny that some-

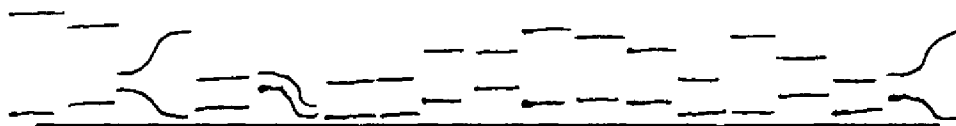
thing of the kind exists, there is a need for a convenient way to describe or analyze it. Spectrograms suggest a way for the prosodist, a solution much too inaccurate in detail and implication for the acoustic phonetician, but sufficiently accurate and useful for poetics,¹³ because data which are too generalized for acoustic use can be refined and elegant for prosodic. Mechanical measurement of much speech shows that each speaker has a general scale of relative fundamental pitches accompanied by higher resonances for all the vowels. Of course, the speaker can vary widely within it and also set the entire pattern of relations around varying central frequencies, but the basic pattern can be seen, abstracted, and generalized. Wide-band spectrograms give a fairly clear picture of fundamental and overtone frequencies, in the form of bars which appear at the level of various frequencies for each sound and which tilt, fade, glide into others and are interrupted by or drift into consonant formations on the spectrogram recording. But these bars, or formants, do occur in typical pitch distributions for the various vowels and diphthongs, and the lowest or first formant (fundamental frequency) and the second formant (first resonance) have been shown to be generally sufficient for vowel identification.¹⁴ These formants can be shown on a generalized chart.¹⁵

Higher



Back vowels clearly drop in pitch from one to the next, central vowels stay centered, and diphthongs glide from the formant pattern of the first vowel toward that of the second. If even a casual inquiry is conducted on the direction of pitch movement of the list, spoken as far as possible with a level intonation, some listeners sense the movement and its direction but show confusion on whether the series [i, I, e, ε, æ] is rising or falling, perhaps because they hear the motion of both formants and give either answer truthfully, or perhaps the articulatory feel of [i] high in the mouth tips the balance of decision for movement from high to low. Yet the human ear can discriminate among certain resonances and pitches.¹⁶ In music these overtones are important as a foundation of harmony developed on the triad,¹⁷ but they can even be isolated and played with for effects.¹⁸ A faint harmony of overtones accompanies the pure tones of musical melody and there is also a faint harmony accompanying the vowels and diphthongs of speech sound, a duet part of tiny degree and force which forms patterns as the vowels fall in sequence. In a sequence such as [ɔ, ε, œ, I, ε, ɔ] the degree of variation is somewhat limited and monotonous, as in the series:

[i I aI ɔ aU ɔɔ ε œ I I ε ɔ I œ ɔ aI]

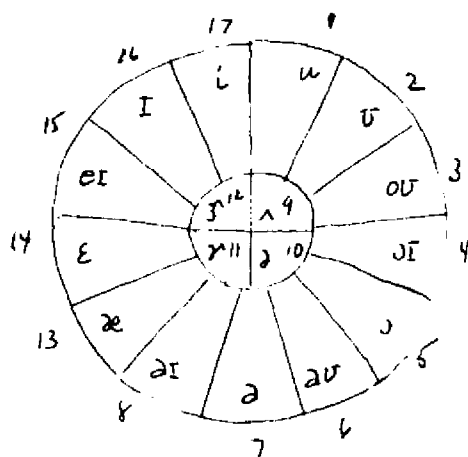


The movement suggests a connected wave with initial and final activity, but it seems a "dull" music. But the following series sings:

[aI I aI æ oU aU æ oU u I ə i]



The first is Eliot's "breeding / Lilacs out of the dead land, mixing / Memory and desire" and the second is from the truly lyric "The Lake Isle of Innesfree." Yeats' first line is "I will arise and go now, and go to Innesfree."¹⁹ On the Metric Score a note is made of such pitch movement in the vowels. The "duet," however, is too ethereal to be crystalized as heard "music," but the movement can be reduced to the tonality tune, on the basis of the vowel wheel of the phoneme key which can be numbered to follow the downward trend of the first resonance bar from [i] around to [u] or in a movement a high of seventeen down to a low of one. The central vowels are numbered as lying between [a] and [æ]. A direction scale is thus formed of indeterminate intervals which can be used as a music scale of compressed but indeterminant intervals and small range.



Low	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	High
	u	U	oU	oI	ɔ	aU	a	aI	ʌ	ə	ɜ	ɝ	ɛ	ɛ	eI	I	i	

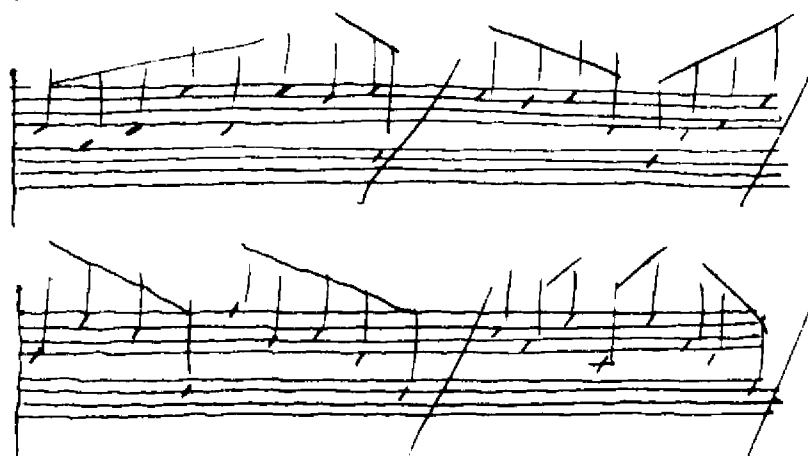
It is an interesting scale whose intervals are not equal and not specified, and it has the added charm of the diphthongs, which are decorative pairs rather than single tones. Syllabic m, n, l and the r-coloring which at times accompanies some vowels besides the central are both unrepresented. It is here proposed that this scale can reduce the relative pitch of vowel sequences to numbers, and that these numbers do suggest something of the upward or downward movement of pitch more clearly than the mere sequence of transcription symbols. For example, the vowel sequence of the first four lines of Edwin Muir's "The Rider Victory" is:

ɔ aI ɔ I ɔ I eI I ɔ	The rider Victory reins his horse
I eI ɔ ɔ ɔ ɛ I I	Midway across the empty bridge
æ I ɛ ɔ i æ ɛ ɔ ɔ	As if head-tall he had met a wall.
ɛ ɝ I ʌ I ɝ ɔ ɔ	Yet there is nothing there at all,... ²⁰

The prominent frequency of some of the vowels is obvious even without a phoneme key and there is clear repetition of [ɔ] but the numbers which indicate an inherent pitch potential reveal some of the reason that a downward "clunk" occurs at "tall," "wall," and "all," since the rest are at mid-range or higher.

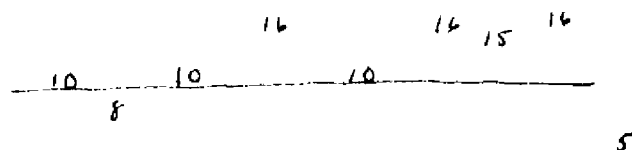
10	8 [∧]	10	16	10	16	15 [∧]	16	5
16	15 [∧]	10	5	10	14	16	16	
13	16	14	5	17	13	14	10	5
14	12	16	9	16	12	10	5	

For those at home with music notation the numbers can be also transferred to a little music staff as long as it is kept in mind that the intervals are utterly imprecise and far less wide-spread than the staff suggests. Durations are ignored and juncture groups are marked together. Lines of the staff are 1, 3, 5, 7, 11, 13, 15, 17, with 9 drawn on a center line like middle C, and spaces are 2, 4, 6, 8, 10, 12, 14, 16. Diphthongs glide.



Music notation is, as usual, too precise for the speech pitches but clearer than the numbers, although there are other satisfactory notations.

Vertical spacing of numbers is also a convenient way to show tunes. The first line of the Muir is:



Dots without the music staff have been often used to show pitch with unspecified intervals.



or a diagram in which the vowel level is extended in a broad line and joined by a light to represent the intervocalic consonants is the one used here to keep the potential pitch movement before the memory. The Muir line is:



Campion has always been noted for his vowel color and the singing quality of his voice.²¹ The musicality of his vowel patterns in "Now Winter Nights" shows more clearly when basic potential pitches are given:

aU	I	ə	aI	ɛ	a	6	17	10	8	14	7	
ə	^	ə	^	ɛaU	ə	10	9	11	10	14	6	11
æ	aU	ɛ	ɔ	I	a	7	6	14	5	1	7	
ə	ə	ə	aI/I	aUa	10	9	10	15/16	6	11		

Now winter nights enlarge The number of their hours And clouds their storms discharge Up on the ayrie towers

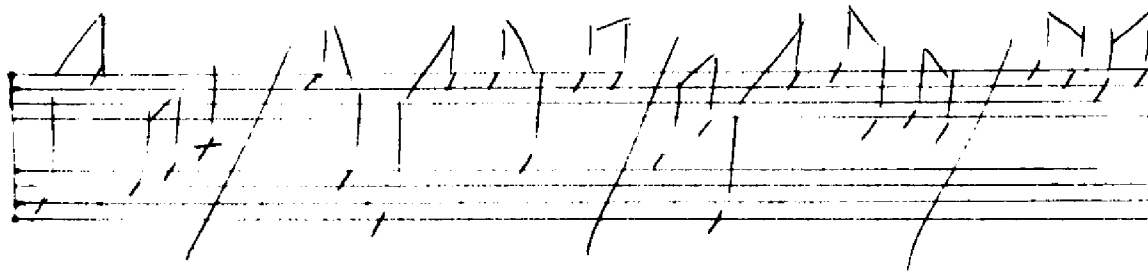
The music transcription "looks" like music and could easily be turned into the intervals of music. Since Campion did set these words himself, it is possible to see if there is any coincidence of the inherent vowel scale movements with the actual pitch movement of the setting.²²

Now winter nights on - large The number of their hours And - clouds their storms discharge Up on - the ayrie towers

Although the first and third lines (marked by bars) do not relate, the second line in the music is almost an inversion of the movement of the vowel music and the fourth line in the music almost follows vowel movement.

Eliot's lines, as might be expected, do not have precisely the "look" of ordinary melody, but do have structure.

eI/I	I	ə	u	ə	ə	1	I	15	16	16	10	1	10	10	9	17	16
aI/I	ə	ə	^	ə	ɛ	æ	I	I	8	10	6	9	10	14	13	16	16
ɛ	ə	I	æ	ə	aI/I	I	I	14	10	16	13	10	8	16	16		
^	u	I	I	eI/I	9	1	16	16	15								



Campion gives the poem as an example to demonstrate quantitative meter. The inherent pitch scale proposed here is crudely put together from data which is the result of search for other ends, but if experiments were done with the aim of preparing a pitch scale specifically as a prosodic aid, it could certainly be corrected and improved. Yet, even in its imperfect form here, it does certainly show something of the direction of movement of the vowels, and perhaps beyond that one should not go. Melody and what makes one melody superior to another is little understood, although again, like "stress," it is recognizable. Hindemith notes that "it is an astounding fact instruction in composition has never developed a theory of melody,"²⁵ and he then goes on to propose such a theory based on exact pitches, and therefore useless here. In the system I propose the tonality tune gives a potential pitch movement which can be brought out in performance by giving it conscious play and thus provides a step toward proposing intonation. If it contains patterns of repetitions, use of the tune will increase the prominence where repetitions occur.

The tonality tunes fall into time, but to segment time by some vowel quality is to return to the Greeks and to poetry measured by

vowel durations and the number of intervening consonants. Quantitative meter is considered briefly in Chapter V along with other metrical systems

The exploration of musical sound patterns has covered single sound frequencies as they accumulate into the phoneme keys, which show tonality, groups of consonants which give timbre, and the tonality tunes which trace inherent vowel pitches. Together they provide the critic with descriptive details in a form which aids precision in comparisons of the style of different selections. The cumulative frequencies suggest kinesthetic ties to meaning and the tunes suggest possibilities for pitch treatment in performance, using inherent language qualities as a starting point.

Part II

Supportive Repetitions

The second main class of pre-metric patterns consists of exact or closely echoing sound repetitions in pairs, brackets, and series. These repetitions all have supportive functions, but are divided into two kinds, the simple pairs, series, and echoes and the positioned repetitions such as alliterations. The premise here is that the supportive function of all these repetitions works to strengthen unity and in some cases to increase grades of stress. Sound repetitions support the unity of the passage which they bridge, and overlapping repetitions therefore strengthen the thrust of the unfolding

message and thus support the unity of the whole work. Sound repetitions also create additional syllabic phonetic noticeability, here termed prominence, which, if it is of sufficient degree, has a supportive function for stress and thus an occasional metric relevance. Such prominence can strengthen the pre-prosodic grade of stress potential of its syllable by adding a pre-metric potential to it. The premise here is, further, that the pre-metric influence of syllabic prominence can be estimated so that pre-prosodic stress grades can be adjusted to pre-metric stress grades for later use in metric concerns. As has been mentioned, the prosodic step includes both the pre-metric and the metric, and as soon as any kind of patterns of repetition are noted, subtle relationships of sound come into notice and slightly shift some pre-prosodic perceptual estimates of relative weights.

Both kinds of supportive sound repetition, first the simple pair or series, and second, the positioned pair or series such as alliteration or stressed assonance have long been noted traditionally. But note has not always been thorough, and the difficulty has always been that, once noted, no convenient way of evaluating their influence on rhythm and meter has been available. Criticism, whatever it has been able to show concerning the contribution of such repetitions to beauty and meaning, has been more able to applaud the poet's skill than to demonstrate the relative force of such phonetic syllabic prominence on rhythmic pace and on metrical pattern. There is, however,

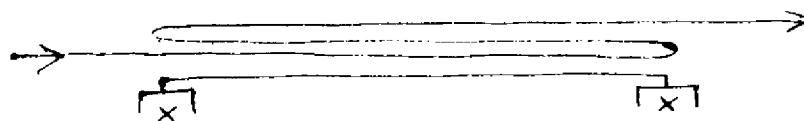
general agreement that there is some such force, and paragraphs are sometimes devoted to arguments defending the extent of that force at some particular point in a poem.

In many of these traditional discussions of weights, furthermore, pre-prosodic and pre-metric aids are generally mingled casually without distinction and often introduced in post-metrical argument so that claims are made on the basis of what are unequal classes and what may therefore be unequal weights. For example, lexical accent, a part of pre-prosodic stress potential, may be brought to the defence of one syllable as a place of ictus, and assonance, a repetition and a part of pre-metric potential, to the defence of another. For example, in Champion's lines the "num-" of "number" has lexical accent and probably would be marked for ictus, whereas "of" does not, and ictus marked on it might be questioned. The assonance in the "now" and "houres" would probably be rated as a condition which reinforces a likelihood of ictus on either. However, the possible assonance in "number" and "of" and the lack of lexical accent on "now" might go uncounted, although only the consideration of both pre-prosodic stress potential and pre-metric phonetic prominence in all places can give balanced weighting and valid support to argument.

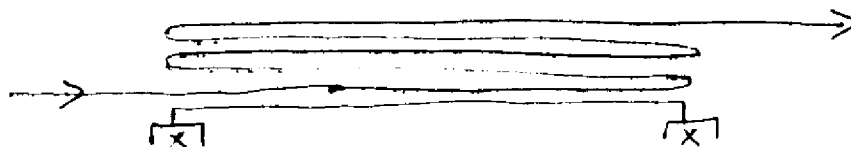
In this system, however, pre-prosodic forces have already been separated out and dissected on the Basic Chart, and the pre-metric force of repetition which creates prominence can also be isolated and analyzed by thorough dissection of the two kinds of supportive

sound repetition, the simple pair or series, and the complex pair or series formed by intersections of pairs with positions and other series.

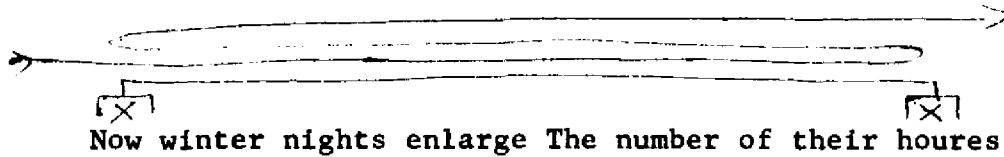
Isolation and dissection of the first kind of sound repetition, the pairs or series of single sounds or the groups which structure unity, is simple to do, and leads to an informed reading. A careful horizontal check of the transcription symbols of the Basic Chart brings all the occurrences to light. That these pairs and series support the strength of a passage has long been recognized, and something about the way that their strengthening action increases with re-reading has long been known. The action can be roughly diagrammed. In a first reading, the memory of the first member of a pair makes the second of the pair more prominent and a bridge of mental activity is created.



On a second reading, the memory of the second event and the anticipation of it, double the power of the bridge as the mental activity multiplies.

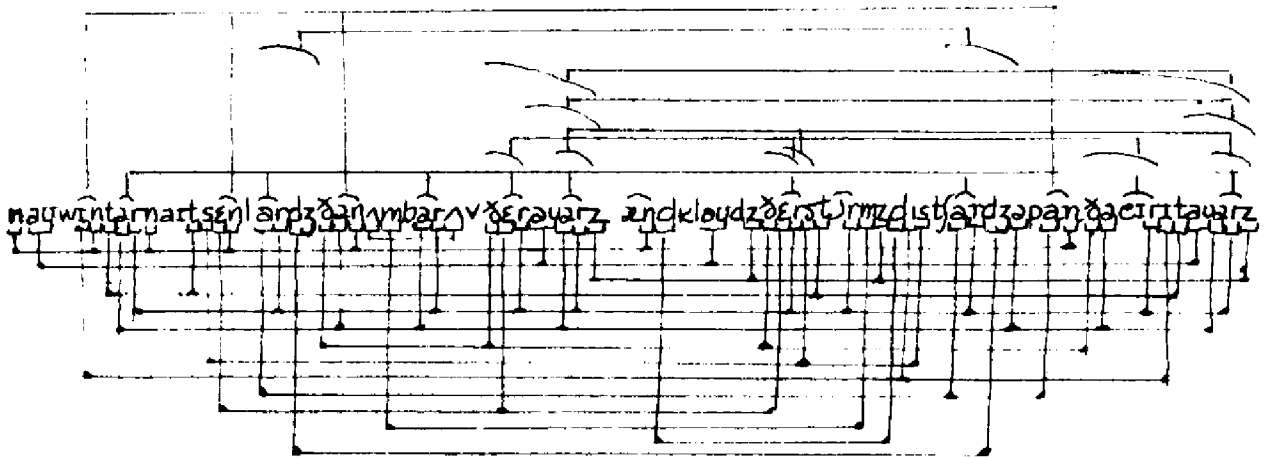


For example, in Campion's first line "Now" and "houres" both contain [aU].



When "Now" is first heard, its vowel has no prominence or added phonetic noticeability. When, however, "houres" is heard, the sound of "Now" is recollected faintly and both in "Now" and "houres" the [aU] adds pre-metric prominence to its syllables. In a re-reading, the anticipation of the sound of "houres" when "Now" is read, creates immediate prominence for "Now" and ready prominence for "houres." When "houres" is read, recollection of "Now" adds to its prominence. Thus both syllables, once the prosodic pre-metric note of repetitions occurs, stand forth and knit the strength of the passage they span whether that span is within a line or extends across a somewhat longer passage. Clearly, the more informed any reading is about the presence of repetitions, the more the strengthening of a passage is felt and increases of syllabic noticeability are experienced. The eventual aim and outcome of the entire system here is precisely that a reading be as fully informed on the sound as possible. Clearly, also, therefore, a complete analysis of all pairs and series is needed as well as a vertical summation of how many members of any series occur at each syllable. Therefore, a complete diagram of all pairs and series is needed for such a reading as well as for analysis and summation of the interconnections among pairs and series.

It is possible to chart all possible pairs and series of repetitions of single phonemes, of groups of phonemes, and of closely echoing groups, but such a diagram is not entirely practical. For example, a diagram of all pairs, series, and echoes for the *Campion* is given below. All repetitions of groups of phonemes are entered above the transcription symbols, and all repetitions of single phonemes are entered below. The position which members of a repetition may have in relation to syllable, word, or stress is temporarily ignored. Repetitions of the single phonemes are arranged by working from both ends inward, and the structure shows the reach of all series in the selection and the number of members of each series.



Clearly it is not satisfactory to carry out the charting of every repetition because the network can become sufficient to obscure the very relationships for which clarification is sought. It is feasible, however, to prepare a Pre-metric Chart which is selective

and provides for the most important of the simple pairs or series without position and for all positioned repetitions.

Of the first kind of supportive repetition, the pairs, echoes, and series not marked by position, the most imposing are those which repeat groups of more than one sound. That is, as generally agreed, a rhyme has more force than the repetition of a single sound and a group of echoes such as, for example, [ɔ-r-ar-ɛr] or [æz-æs-æf-æt] is almost as strong as the exact [ar-ar-ar] or [æf-æf-æf-æf], and less blatant. These groups can be charted.

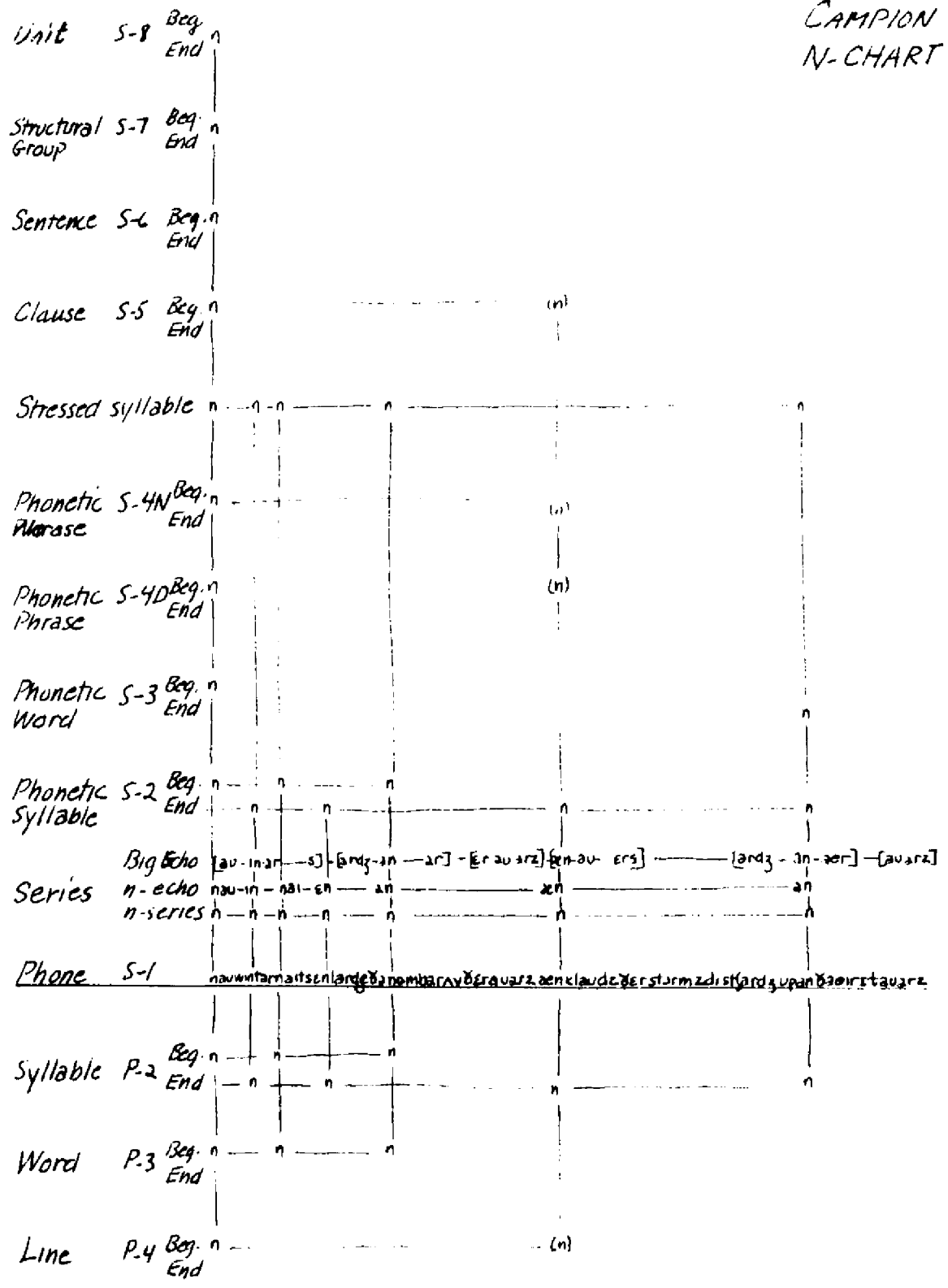
Of the second kind of supportive pre-metric repetition, those marked by position, all are important and all can be charted. Since sets of repeated single sounds are a constant occurrence in language, no set is more important than another until it intersects with some other marked repeating feature such as stress, another sound series, or a position which marks some boundary in the structure. An alliteration is such a set, and it is generally agreed has more force than a repetition whose members lie in a middle of a syllable here and an end there, or in a stressed syllable here and an unstressed there. Or, for example, the assonance in Campion's first line of [aU] in "Now" and "houres" is such a set and its members intersect in each syllable with position. Each [aU] ends a syllable. These [aU]s are more important than the [t]s of "storms" and "towres" which do not have similar position in their syllables.

Both kinds of supportive repetitions, the repetitions of groups of sound and the positioned repetitions of single sounds,

need evaluation in any weighing of pre-metric sound prominence and in any diagram which is designed to serve that weighing. The isolation and dissection of positioned repetitions is simple to carry out by means of the structure which the Basic Chart provides. A careful vertical check of each single sound brings to light possible positions it can fill in the structure and its connections to other sets of repetition.

Something of the way in which such interconnections act in the structure and from which certain points accumulate weight has long been recognized, but analysis of weights has not been refined enough to make clear distinctions as, for example, among members of an alliteration. Yet such distinction is needed to show the various relations of each alliteration to meter. That there is a basis for making such distinctions and that each sound webs all sounds and contributes to spots of prominence becomes visible when the interconnections of a single sound are pursued, and charted. For example, an abstracted pre-metric diagram of the action of [n] in the *Campion* selection uncovers its part in the sound structure. The diagram uses the rows of the Basic Chart and shows how [n] lies in a horizontal series whose members touch members of other series and how it lies in points whose vertical reaches intersect positions at beginnings and endings of the various units.

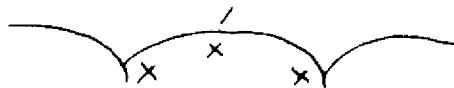
CAMPION
N-CHART



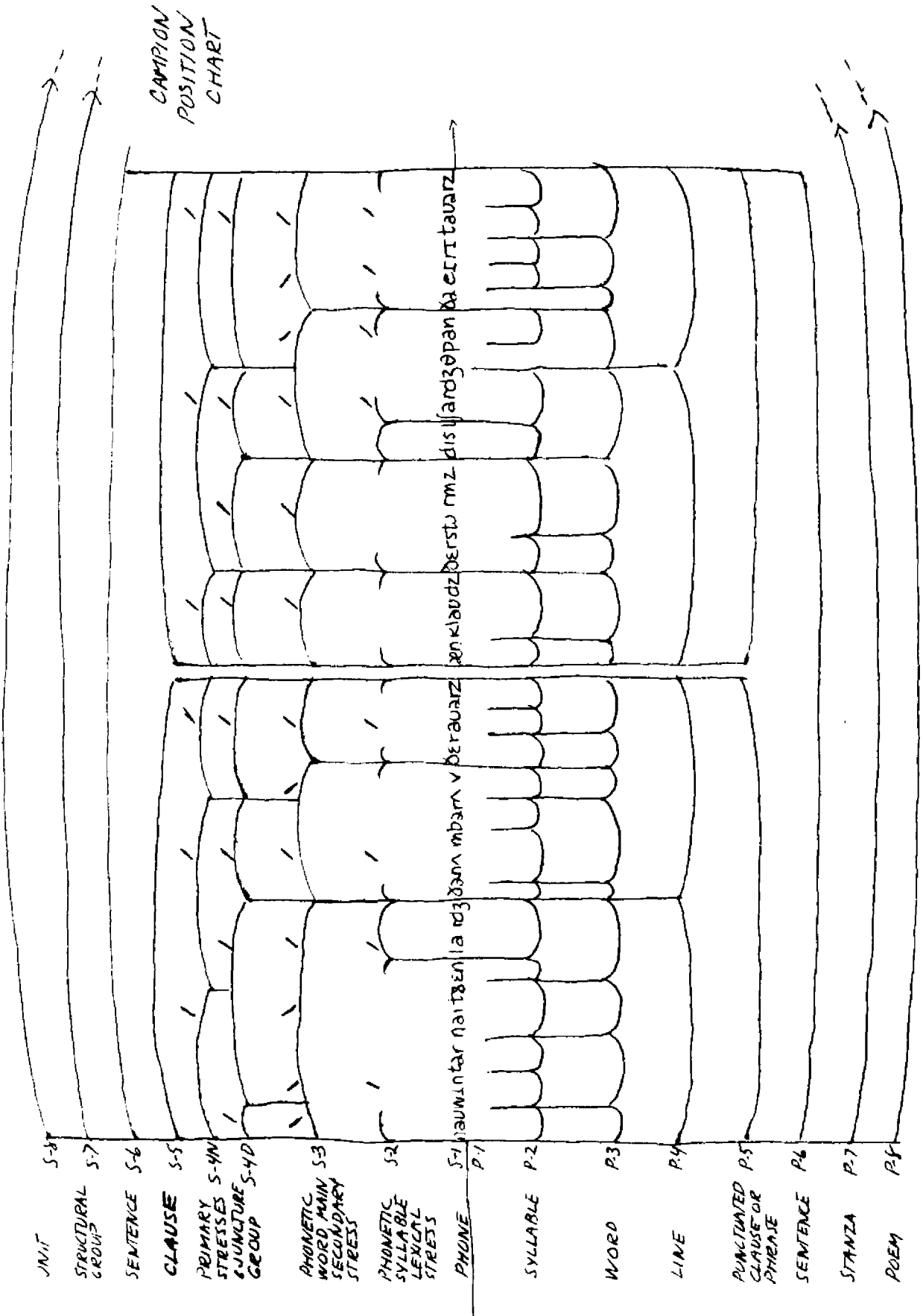
The diagram of [n] shows its function in the sound structure but it also shows that distinctions can be made concerning the varying weights among members of the alliterative [n] series. For example, the [n] of "nights" begins four kinds of unit, the phonetic syllable, phonetic word, the print syllable, the print word, and intersects with the [nau-In] - [naI-ɪn] echo series, whereas the [n] of "number" begins with two units, the print syllable and the print word, and intersects the echo series [nau-in-ɹr] - [ardʒ-ɹn-ɹr]. The two [n]s are not equal in sound prominence. However, only when the remaining sounds of their syllables are considered can a judgment be made on the metric relevance of the weight of [n]s and their syllables.

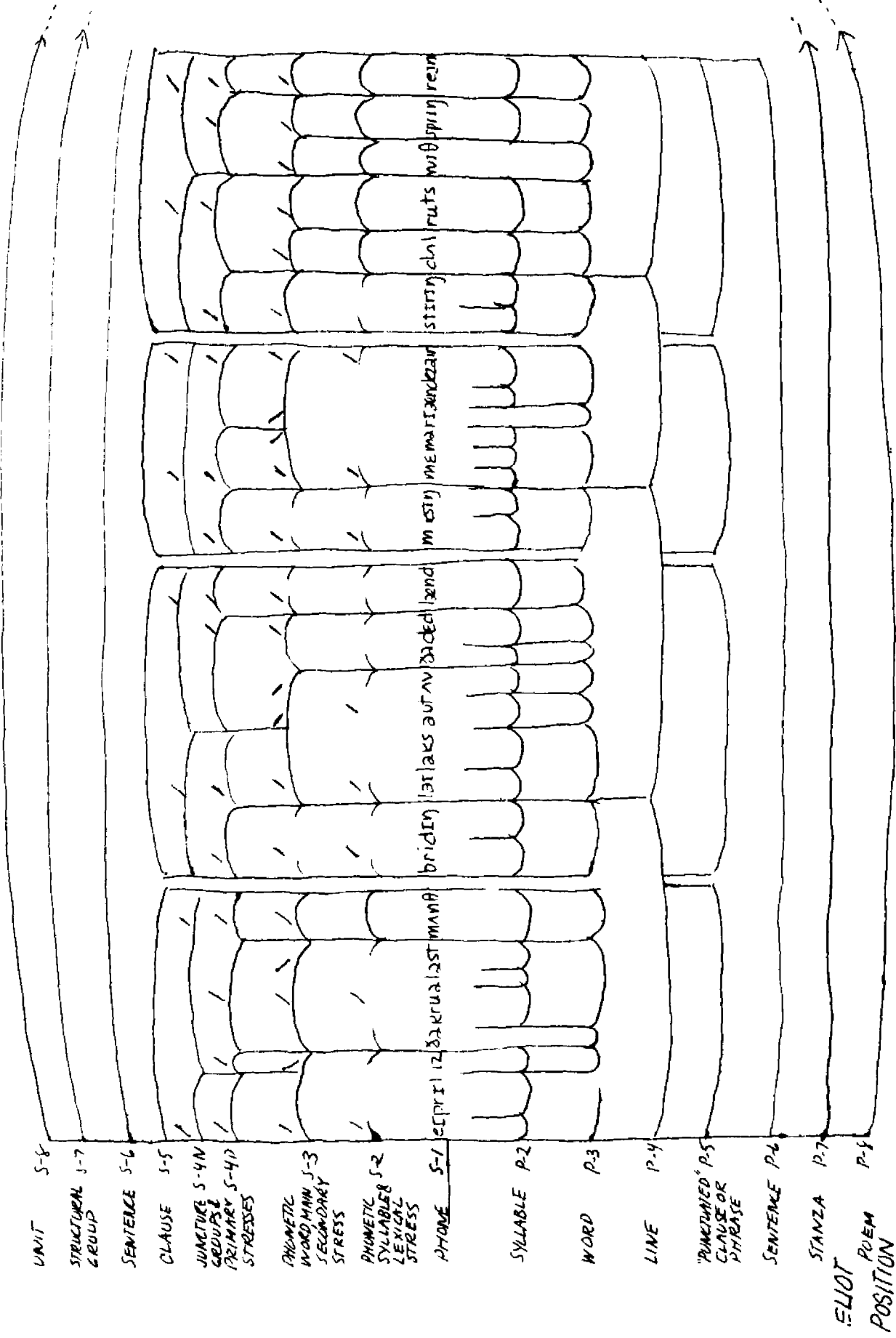
Each repeated sound of any selection is functioning in the same ways as the [n] in greater or lesser degree. The [n] functions, for example, in lower degree than the [au], but it is not practical to chart each sound, because such dissection offers no way to reconnections. It is feasible, however, to use the framework of the Basic Chart for both dissection and connection of repetition weights.

Every Basic Chart contains a ready diagram of all the unit beginnings and ends as well as the stress components of every row and thus provides a chart for the occurrences of three kinds of position which a sound can occupy.



Basic Charts of different selections will vary in many of the positions they permit. The positions which can be occupied in the Basic Charts of the Campion and the Eliot are shown in tracings on the next two pages. The inner corners of every bracket are either beginnings (B) or endings (E), and a place under every stress (S) can be occupied by a vowel or diphthong. Wherever a beginning or ending of a syllable is not discrete in sound, no B or E position is available in sound. The diagrams show the design of all the possible places of position for each selection. They also show the character of the general framework of each selection in the pattern of structure blocks. These blocks are created by the horizontal unit rows and by the vertical lines drawn through the points of clear separation between units. The structure blocks are not a prosodic element, but nevertheless can be useful for critical comparisons of style in structure. The vertical lines do, however, indicate vertical position shafts and show the comparative reaches of possible alliterative sets.



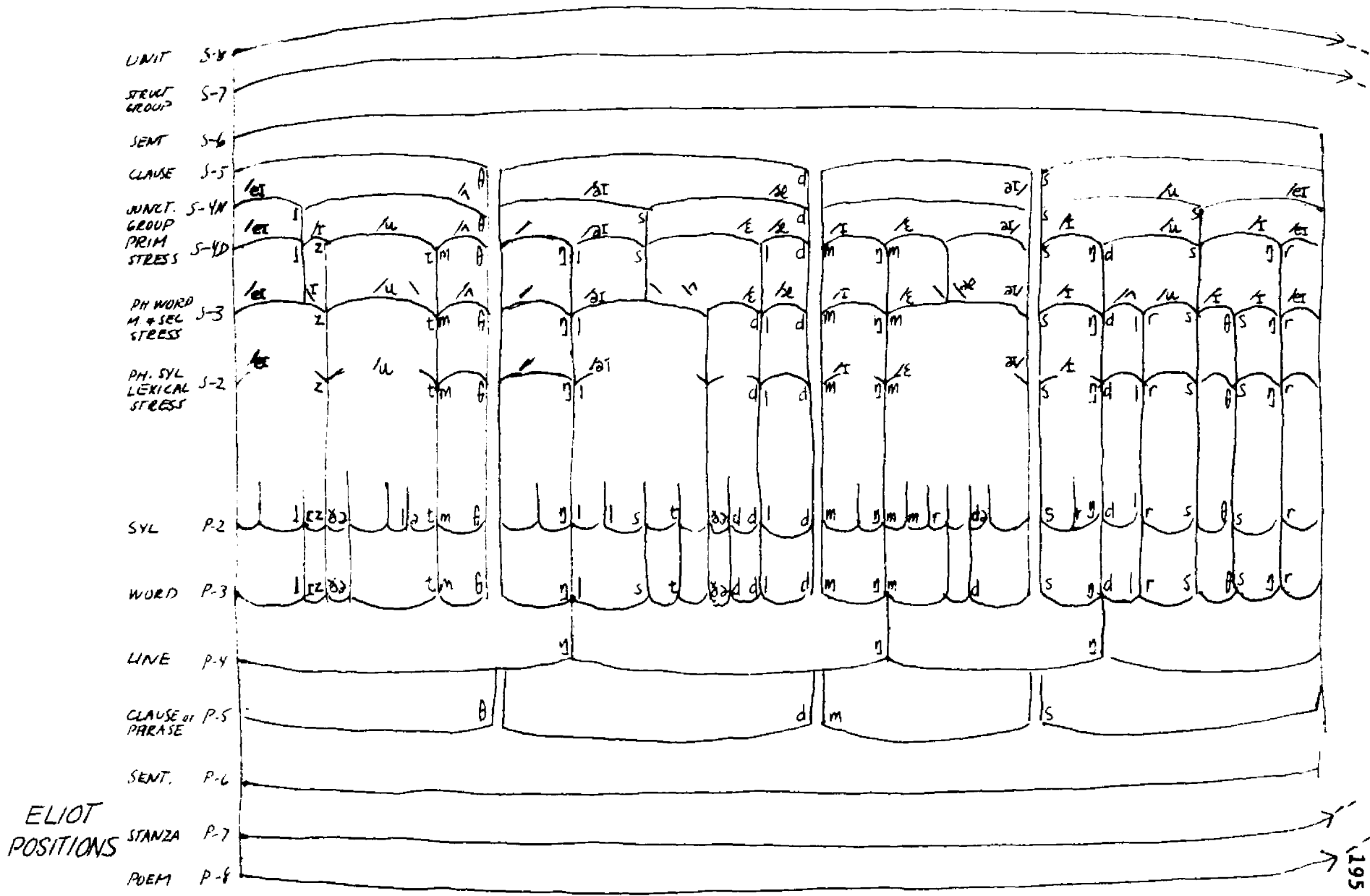


ELIOT POEM POSITION CHART

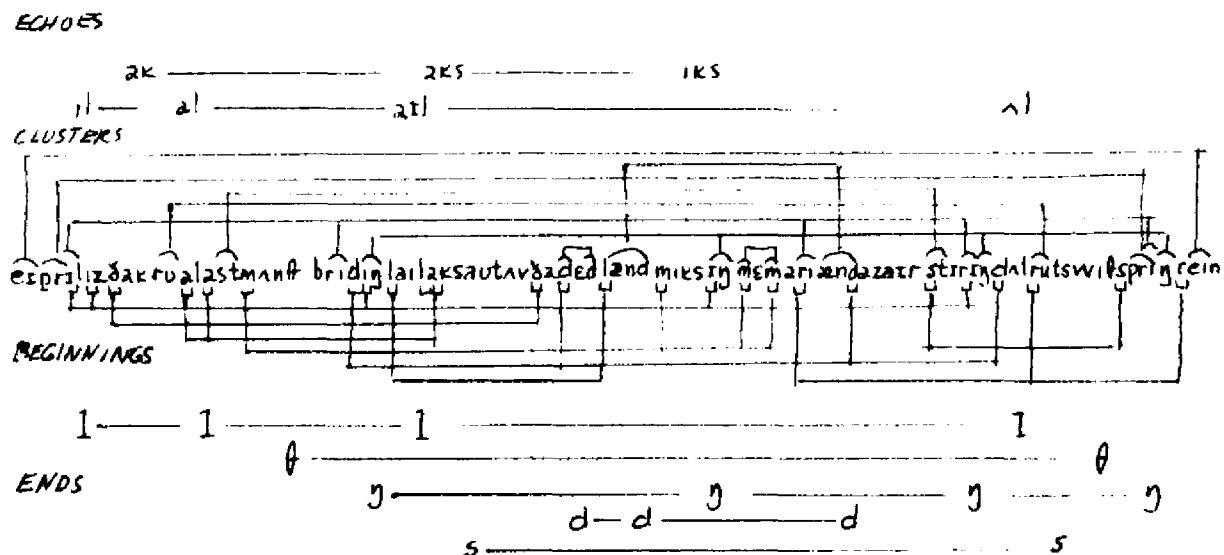
The difference between the framework of each selection shows in these empty position charts. In Campion's chart the horizontal units and the vertical structure shafts define a square, orderly, and nearly bisymmetric framework and set of available positions. The Eliot shows greater variety and freedom of design although the structural repetition is in four sections overlapping four secondary offset sections and the last section is distinguished by a fence-like array of position shafts. In any position chart not every sound can have a position and some will clearly have more than others. The greater the extent of vertical plunge and thrust of a position shaft the more the possible positions accumulate upon it as it crosses the rows. But for the estimating of metrical weight mere position alone is of insufficient value for prosody. Only a sound which is repeated elsewhere in the selection in the same category of beginnings (B), ends (E), or at stress (S) deserves entry. Such positioned and repeated sounds structure the corners of an implied block:

position	n	—	n
repetition	n	—	n

The Eliot Basic Chart is shown with the positions which can be filled under this limitation.

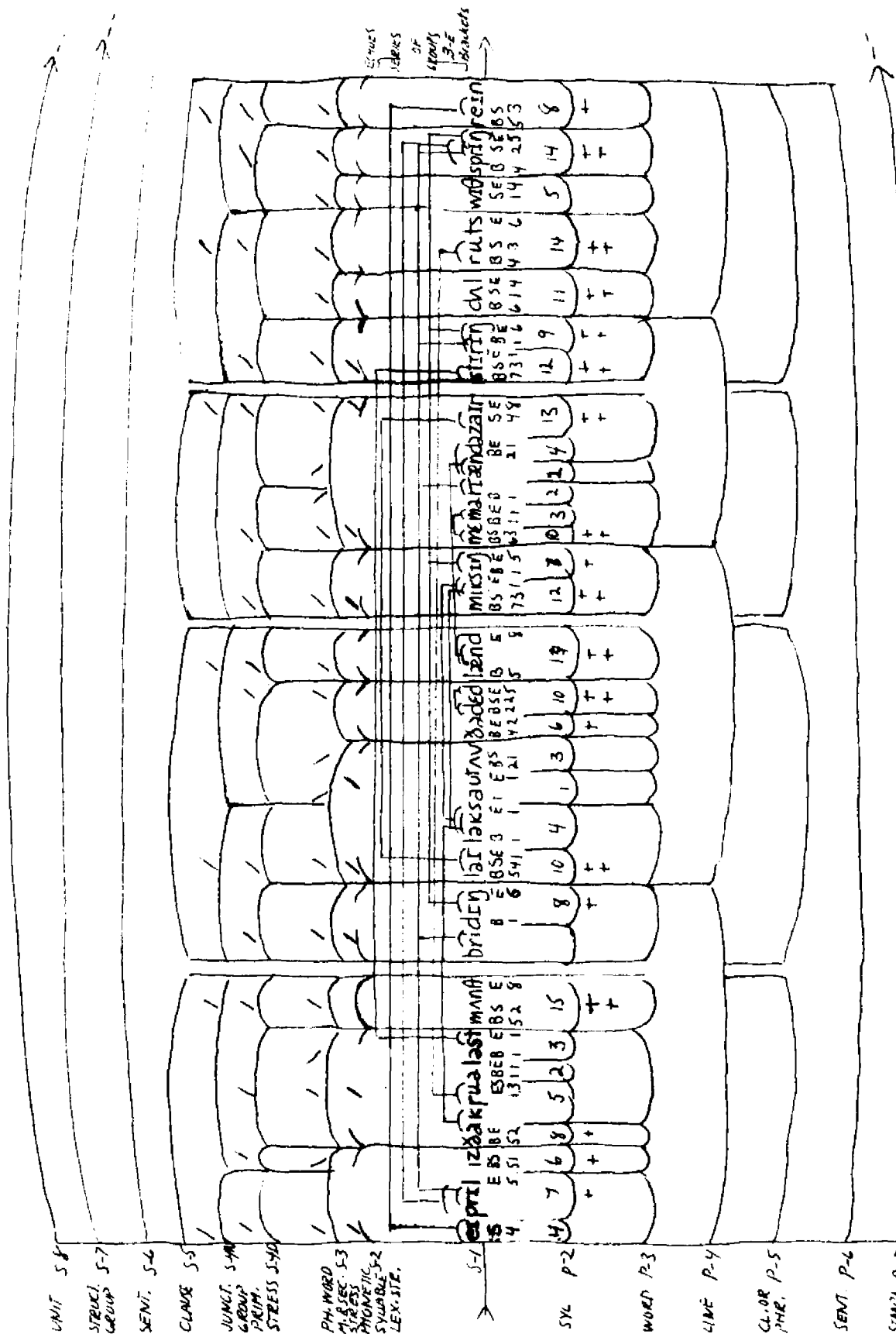


The extent of positioned sound repetition in the Eliot is perhaps surprising, but the chart is provided precisely for demonstration of the fact that assonance or alliteration may be pervasive in a selection which does not at first seem to contain much of either. The chart is not yet complete since the positioned repetitions need to be combined with the echoing clusters in order to give more refined estimates of the weight of individual syllables. Traditional marking of these occurrences has always provided a fragmentary picture of both. A fuller picture could be achieved, for example, by marking the repetitions in four clear sets of cluster echoes, cluster series and brackets, beginnings, and ends, but stress positions would not be accounted for.

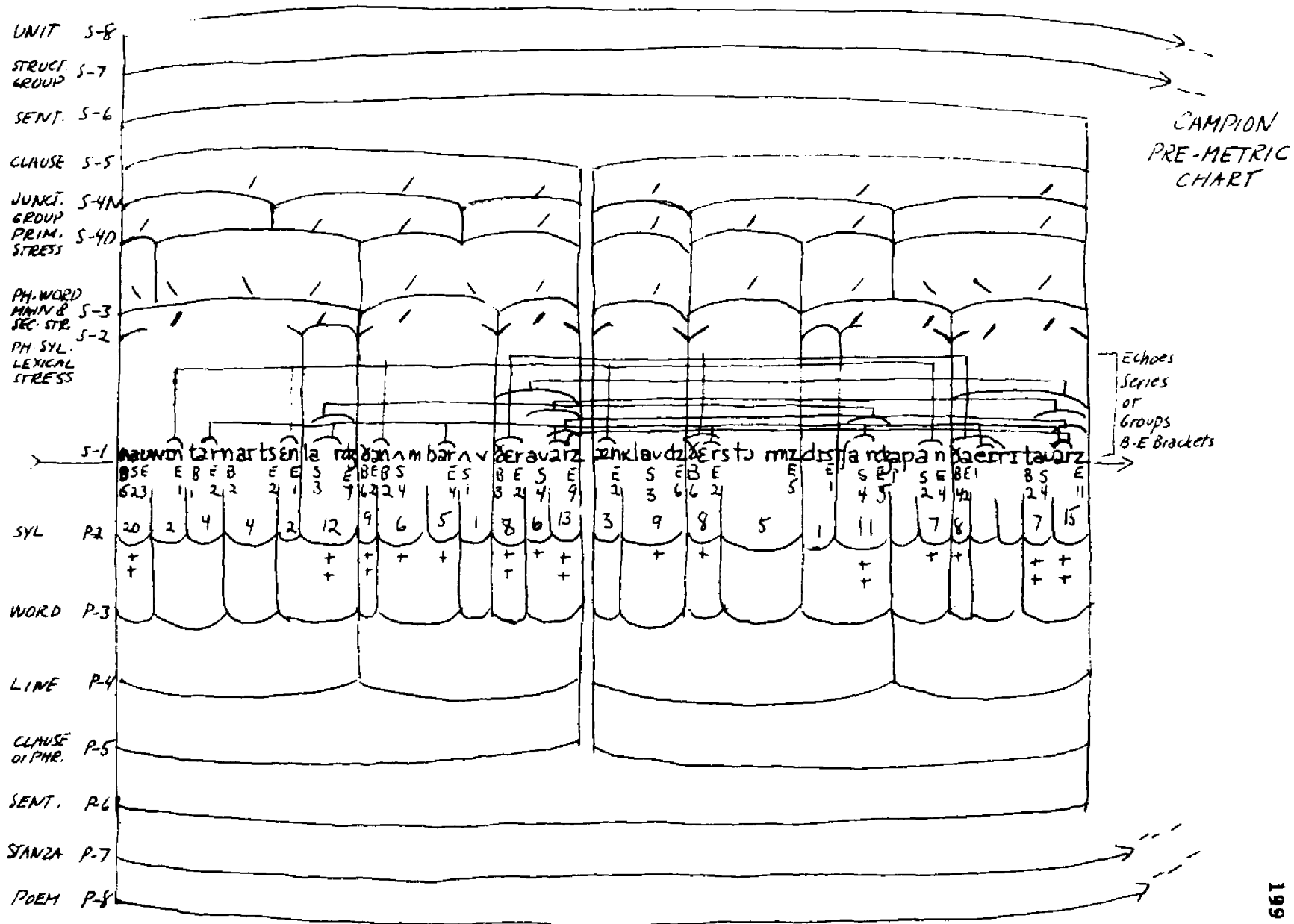


Overlapping echo and alliterative series stiffen the horizontal strength. In this selection it is at the transition from line end to line beginning that the echoes cluster. But such a diagram, although structurally informative, does not provide a way to relate the weight of the occurrences of repetition to a metric. The full Pre-metric Chart proposed here does. It includes all the repetitions and provides a tally representing the potential of relative phonetic prominence which each sound contributes to its syllable, and also the relative influence of that prominence on the pre-prosodic grades of stress potential.

On the next pages complete Pre-metric Charts are given for the Eliot and Campion selections. In practice they are most easily done on tracing paper over a Basic Chart. A simple vertical count along each shaft and at stress points quickly gives the number of positions any sound is filling. But here they are shown with the full framework of the chart drawn in, and with Row S-2 moved up slightly to provide room for the B-E brackets and the series of clusters and echoes.



ELIOT
PRE-
METRIC
CHART



The charts show the presence and the cumulative weight of sound repetition. Above the axis are series of repeating clusters and B-E brackets of sounds which appear in a beginning and an end. Below the axis is the tally of each sound along its shaft intersections and of each syllable's cumulative prominence. Under the P-2 Row are plus signs and double plusses which indicate a medium or a high cumulative prominence.

There are two traditional principles which underlie the tally of the Pre-metric Chart. The first is the concept that sound repetition, particularly positioned repetition, creates some kind of noticeability or prominence for the syllables in which it occurs. The second is that such prominence can occasionally support decision on ictus. The principles proposed in addition here are, first, that the greater the coincidence of any kind of repetition in any syllable the greater the total prominence, second, that the weight of such prominence can be given a more delicate evaluation than heretofore, and third, that possible pre-metric influence of prominence on potential stress grades can also be estimated. Included in the traditional concept of "position" is the force of the printed syllable, word, punctuated phrase, and line boundary. The concept of position used here includes the traditional. The pre-metric step is a part of the prosodic step and prosody has always noted unit borders. Linguistic analysis from a given utterance cannot always specify syllable and morpheme borders from the sound, but in the analysis here which moves from print to proposed sound, word borders and line units are already given. The

prosodist knows them, and while he may not eventually make all borders discrete in performance, he is aware of them as he analyzes. Indeed all prosodic analysis invokes perceptual awarenesses not always demanded for casual speech. The prosodic step in both its pre-metric and metric parts calls into play cues and faculties not normally needed for ordinary prose. Therefore, the print beginnings and ends are counted as well as the discrete beginnings and ends in sound. The discrete printed syllable, moreover, is used as a unit for tally because in moving into metrics it becomes a functioning unit and because the indefinite quality of some of its edges has already been included in the pre-prosodic reckoning.

The second traditional concept accepted here is that sound repetitions can occasionally support a decision on ictus.²⁸ However, the refinement proposed here is that the syllabic prominence created by sound repetition can be roughly estimated so that the most strongly weighted are distinguished and credited with a slight pre-metric influence on grades of stress potential. These slight raises can then be used to smooth the fit of a metric theory on the basis of weighing all syllables, rather than, as often in the past, on the basis of fragmentary consideration of occasional syllables.

The mechanics of tabulating the weights is simple, if slightly tedious, but it is revealing. Only members of positioned repetitions appear on the transcription row and each is tallied by a vertical count, one point for filled position or place at stress and for every bracket of which it is a member. Since stress appears only in the

sound half of the chart, place at stress is counted only in the Sound rows. Since bracketed groups can be nested, as $\left[\left\{ \left[r a U \right] r z \right\} \right]$ in the Campion, a sound can accumulate several points of weight from brackets. The second $[r]$ of the example collects four points, one from each bracket. Syllable weights are the totals of the tallies for their individual sounds. The relative influence of the syllabic totals are classed as: 1 - 5 negligible and not marked; 6 - 10 moderate, marked plus; over 10 strong, marked double plus.

The total prominence weight of any syllable may have a slight pre-metric influence on the pre-prosodic stress grade of that syllable and therefore, eventually, on metric patterns. Negligible syllabic totals of 1-5 have no influence on stress grade. Moderate totals of 6-9, marked plus, add sufficient prominence to increase a stress grade slightly, and may possibly but not necessarily add enough to raise a syllable one stress grade. Strong totals over 9, marked double plus, do add sufficient prominence weight to increase stress by one grade. In short, the additional dynamic syllabic force created by sound repetition is very limited. Such extremely limited force is easily realizable in sound by the most delicate of movements in any parameter of sound, but because it is customary to think of this influence in a post-metric fashion in terms of binary metric stress, it is perhaps difficult to regard the phonetic prominences formed by phonetic repetitions as pre-metric forces and difficult to think of them in terms of slight adjustments on six grades of potential stress. Therefore, for example, the pre-metric prominence totals on

"houres" in the Campion may be surprising. [aU] has only a total of 6, rated as a single plus; [ʔrz] has a total of 13, rated as a double plus. If only a binary concept of stress is considered, then the ratio of the prominence added by sound repetition becomes confusing. The "unstressed" syllable, [ʔrz], then would seem to have greater weight than the "stressed," [aU], and habit of thought would lead to a rejection of prominence totals as unfounded. If, on the other hand, six grades of stress are considered, then the ratio of prominence added by sound repetition is acceptable. The contrast between the pre-prosodic stress grades of the two syllables of "houres" is extreme; the pre-prosodic analysis has given the grade of [aU] as 5, the highest possible grade, and the grade of [ʔrz] as 0, the lowest possible grade. The addition of pre-metric weights does not destroy this basic stress contrast, but merely makes it less extreme by a slight adjustment. The [aU] is not changed in grade by the moderate pre-metric weight, and the [ʔrz] is only raised one stress grade by its pre-metric prominence. The pre-prosodic stress contrast of 5 to 0 is thus adjusted to the pre-metric contrast of 5 to 1. The adjusted stress grade of 1 on [ʔrz] can, moreover, be realized in sound by a slight extension of the syllable, and extension is already a natural feature for a syllable before major juncture.

The word [ʔλ] presents some problem. Because it is so constantly present and is a signal of structure, the habit of noting its presence and function submerges the attention paid to its sound. But the sound

of $[\delta\lambda]$ can be repeated or it can be closely echoed as $[\delta\epsilon r]$, "their," echoes $[\delta\lambda]$. When $[\delta\lambda]$ is thus a member of a pair of echoes which initiate and lie in an imposing group of echoes such as $[\delta\epsilon raU\lambda rz]$ - $[\delta\lambda eIrItaU\lambda rz]$, then the sound repetitions raise the pre-metric prominence of $[\delta\lambda]$ and $[\delta\epsilon r]$. However, the pre-prosodic stress grade of each in the *Campion* selection is zero, and the pre-metric weight is so moderate that the stress grade may not change, or at most may be raised to 1. Thus in certain sound contexts even such a word as $[\delta\lambda]$ can acquire some measure of pre-metric prominence. The increase to a possible stress grade of 1 could be realized by the slightest of phonetic alterations.

These examples show that the pre-metric adjustment of the stress grades only occasionally raises a pre-prosodic grade in such a way that later metrical decisions based on stress grades would be shifted by the adjustment. The pre-metric weights most often serve to show the subtle rhythmic relationships among syllables.

In the *Campion* the pre-metric weight of prominence caused by sound repetition collects at the rhymes. In the *Eliot*, pre-metric weight clusters somewhat around line ends and beginnings, but is generally distributed more evenly than in the *Campion*. Enough weight collects, for example, at each $[In]$ to raise each a grade, but the prominence can be realized phonetically not as heaviness but as an extension of duration natural before potential junctures.

In both Pre-metric Charts the importance of the initial syllable of the selections show in the large pre-metric weight on it. It is

not surprising that the strong pre-metric weight of an initial syllable is sometimes sufficient to influence later metrical decisions. It is common for the initial syllable of a selection to acquire ictus even though such ictus is an exception to the predominant metrical pattern of the selection.

Co-ordination of pre-metric weights to pre-prosodic stress grades shows that syllables with high stress potential are often the syllables with additional strong pre-metric weight. High pre-prosodic grades are thus often reinforced so that syllables already noticeable for a high stress potential they are carrying become marked even more strongly. It is on such strongly marked syllables that ictus is apt to fall. But consideration of the fall of ictus brings the discussion to the metrical patterns which rise out of the adjusted grades of stress and to the Metric Score in the next chapter.

Chapter IV Footnotes

¹In Russian formalist doctrine this is referred to as "orchestration;" see Rene Wellek and Austin Warren, Theory of Literature (New York, 1956), p. 159.

²Edward Sapir suggests that kinesthetic factors as well as acoustic may be a reason when certain vowels sound "bigger" than others. "A Study in Phonetic Symbolism," Selected Writings of Edward Sapir in Language Culture and Personality, ed. David G. Mandlebaum (Berkeley, 1951), p. 69. On sound symbolism see also R. W. Brown, A. Block, and A. Horowitz, "Phonetic Symbolism in Natural Languages," Journal of Abnormal and Social Psychology, L (1955), 388-393.

³David J. Masson discusses the function of various sound patterns in "Sound in Poetry," in Encyclopedia of Poetry and Poetics, ed. Alex Preminger, Frank Warnke, and O. B. Hardison, Jr. (Princeton, 1965), pp. 784-790. See also his suggestion for bond density weighting, "Thematic Analysis of Sounds in Poetry," in Essays on the Language of Literature, ed. Seymour Chatman and Samuel R. Levin (Boston, 1967), p. 55.

⁴Cf. Levin's "couplings," which occur when "equivalences" of a phonic or semantic nature are set into "equivalent positions in the syntagms," Linguistic Structures in Poetry (The Hague, 1964), p. 41.

⁵Objections have been raised that the statistics of language destroy the importance of statistics of phoneme or cluster counts within a poem, because the statistics of the language support the

probability that the coloration would have occurred as part of the distribution of elements of the language medium. Gustav Herdan, Language as Choice and Chance (Groningin, 1956), p. 2. See also Claude E. Shannon and Warren Weaver, The Mathematical Theory of Communication (Urbana, 1959) and for summaries and bibliography of recent work Charles E. Osgood and Thomas Sebeok, Psycholinguistics: A Survey of Theory and Research Problems. With A. Richard Diebold, Jr., Survey of Psycholinguistic Research, 1954-1964 (Bloomington, Indiana, 1965).

⁶For studies on phoneme frequency and their relation to meaning, see J. J. Lynch, "The Tonality of Lyric Poetry: An Experiment in Method," Word, IX (1953), 211-224, and Dell H. Hymes "Phonological Aspects of Style," in Style in Language, ed. Thomas A. Sebeok (New York, 1960), pp. 109-131.

⁷See, for example, I. A. Richards explanation of why he selected "python" over other possibilities for his poem and how sound pattern influenced him, "Poetic Process and Literary Analysis," Style in Language, pp. 9-23.

⁸The Complete Poems and Plays: 1909-1950 (New York, 1952), p. 50.

⁹Works, ed. Percival Vivian (London, 1909), p. 219.

¹⁰Ants Oras, "Spenser and Milton: Some Parallels and Contrasts in the Handling of Sound," Sound and Poetry (English Institute) ed. Northrop Frye (New York, 1957), pp. 109-133. Oras finds Spenser tends to prevocalic clusters and Milton to postvocalic.

¹¹Francis Berry, "The Poet's Voice: The Influence of the Poet's Physical Voice on His Work Especially Its Typical Grammatical Forms," Poetics, ed. Donald Davie et al (The Hague, 1961), pp. 453-461.

Berry suggests that the poet's physical voice affects his work and that a poet conceives of language as "an agent, something which he wields through the vehicle of his body. He conceives of language therefore as physical, disturbingly physical," (p. 451).

¹²ed. J. M. Nosworthy (London, 1955).

¹³I. A. Richards in 1928 states the certainty that the poet controls vowel pitches. "A more serious omission is the neglect by the majority of metrists of the pitch relations of the syllables ... But that a rise and fall of pitch is involved in meter and is as much part of the poet's technique as any other feature of verse, as much under his control also, is indisputable," The Principles of Literary Criticism (New York, 1928), p. 141.

¹⁴For basic technical discussion and examples see throughout, Ralph Potter, George A. Kopp, and Harriet C. Green, Visible Speech (New York, 1947); Martin Joos, Acoustic Phonetics, Language Monograph No. 23 (Baltimore, 1948), and spectrogram inserts at the close of the text; and Gunnar Fant, Acoustic Theory of Speech Production (The Hague, 1960), pp. 245-265.

¹⁵This chart is based on formants given by Potter in an early and idealized or simplified set (pp. 60, 280-282), and also those given by Peter Ladefoged for his own vowels, Elements of Acoustic Phonetics (Edinburgh, 1962), pp. 96, 97, 102.

¹⁶The human ear is even capable of making a formant frequency analysis. H. Von Helmholtz in 1859 built a theory of vowels which, "in general is regarded as correct even today" merely by placing "an acoustic resonator in front of the ear, observing how differently tuned resonators respond to the individual partials in the complex sound," and "S. Smith, by hearing alone, made a formant frequency analysis of Danish vowels in 1947, which proved to be highly accurate," in "Analysis of Vowel Sounds by Ear," Archives Néerlandaises de Phonetique Experimental, XX (1947), 78-96. Herbert R. Moses, Phonetics: History and Interpretation (Englewood Cliffs, N. J., 1964), pp. 176, 99, 100. See also H. F. L. Helmholtz, On the Sensations of Tone as a Physiological Basis for the Theory of Music, 2nd English ed., Alexander J. Ellis, trans. (New York, 1954) and Louise Kaiser, ed. Manual of Phonetics (Amsterdam, 1957).

¹⁷For a pure tone on an instrument there are two stronger overtones which form a triad; that is, when C is struck on the piano with the strings open to vibration, higher C, E, and G resonate. For overtones in musical terms see Paul Hindemith, The Craft of Musical Composition, rev. ed., 2 vols. (New York, 1945), I, 15-23.

¹⁸Bela Bartok has an interesting piano composition using overtones in his Mikrokosmos (London, 1940), IV, 102, pp. 12, 13.

¹⁹William Butler Yeats, The Variorum Edition of the Poems of W. B. Yeats, ed. Peter Allt and Russell K. Alspach (New York, 1966), p. 117.

²⁰Collected Poems, 2nd ed. (New York, 1965), p. 142.

²¹Miles Merwin Kastendieck mentions that "resonant beauty emanates from the vowel sounds," England's Musical Poet: Thomas Campion (New York, 1963), p. 87. Catherine Ing, commenting on Campion's sound linking says of "Come Let us Sound with Melody," that "The succession of vowels and the succession of consonants almost give the impression of two melodic lines," Elizabethan Lyrics (London, 1951), p. 164. Hallett Smith notes "His remarkable utilization of the convenient freedom of the vowel" and of "When Thou Must Home" says that "The delicacy of the manipulation of vowel sounds is so extra-ordinary that one feels that here is an ear even more sensitive than Tennyson's," Elizabethan Poetry (Cambridge, Mass., 1952), p. 283.

²²Edmund H. Fellowes, The English School of Lutenist Song Writers, Second Series, Vol. X (London, 1926), p. 22.

²³Kastendieck gives lavish praise. "Its beauty lies in the subtlety of the rhythm and melody of the trochaic numbers of the poem as a whole as well as in such detail of perfect sound as 'either other sweetly gracing'. . . . Alliterative values heighten the effect while a more resonant beauty emanates from the vowel sounds. Assonance may further enrich the sound of these 'bare numbers' especially when the gradation is as beautiful as it is here," England's Musical Poet, p. 87. Catherine Ing notes that it "has always had its beauty admitted," Elizabethan Lyrics, p. 164.

²⁴Observations in the Art of English Poesie (1602), Works, ed. Percival Vivian, p. 50.

²⁵Hindemith, I, 173.

²⁶The unifying function of echoes in Campion can extend beyond the line according to Kastendieck who says of "Rose Cheekt Lawra" that "Echoes of various hues bind the stanzas together," England's Musical Poet, p. 87. Mrs. Ing believes Campion's vowels force length on certain syllables and she states that "The linking of both vowels and consonants makes it impossible for the verse to fall apart," Elizabethan Lyrics, p. 164.

²⁷The sound effect of the Eliot at first reading seems casual and declarative, and the amount of alliteration does not immediately reveal itself. This contradiction in effect drove me to check ordinary prose to see if such interwebbing was in fact there. I did a few counts of contemporary prose picked up at random and found the alliterative overlapping to reside mainly in a few such sets as the-the, an-an-and, in-it-is, the-their-than, and similar series with occasional repetitions of a subject word. Nor does such strong alliterative overlapping occur in the Campion, although it has a stronger echo series.

²⁸Although such patterns as these were counted within the line in classic prosody, the quantitative basis of the prosody made the relation of the figures to the sound a melodic or musical one, whereas in English verse, where stress tends to dominate, the figures of repetition sometimes have a function of contributing to stress.

Chapter V

The Metric Score

The prosodic step of the system is the second step of the system and consists of two parts, the pre-metric patterns which have been discussed in Chapter IV and the metric patterns taken up in this chapter. The Metric Score incorporates the results of the pre-prosodic and pre-metric analyses and provides a framework which displays a hierarchical system of metric patterns. By means of these metrical patterns defined in terms of six adjusted grades of stress and by means of the durations of the units within them, the metrical patterns which best coincide with the available stress grades of any selection can be found. Moreover, by means of the six stress grades, the particular rhythms of any selections can be described and compared, within their metrics, if any emerge, or without metrics, if none appears.

The premise is that the previous dissection and summation provide the basic stresses and durations out of which metric emerges and on which a metric pattern, abstracted from various other selections, can also be imposed to try its fit.¹ The premise is also that, as is generally agreed, stresses are the main marks which define most English metrics and syllables the main units through which the segments between selected stresses are counted. But the premise is, further, that traditional theories of stress-metrics can be refined and extended by defining them in terms of the six inherent grades of stress.

A distinction is here made between metrics and rhythm. The first is a patterned regularity in terms of units usually marked by stress, or in terms of units such as syllables, juncture groups, or lines. The second is the inherent quality of and the sequential fall of the pre-prosodic stress grades and durations. For example, a metric such as iambic pentameter, can be defined in terms of traditional binary stress as five alternations of unstressed with stressed syllables, and a line of it can be marked by

x / x / x / x / x /

where x is no-stress and / is yes-stress or ictus. In such definition and notation the meter is described, but the rhythm is not. However, if the fall of the six stress grades for the syllables of the same line are, let us say,

03 14 25 14 05

the alternating metric still appears, but the rhythm is also given. The metric alternation is visible in the low stress grades of the first members of pairs and the higher stress grades of the second members of pairs. The rhythm, the sequential fall of inherent grades of stress and therefore of basic durations, also shows.

The advantage of this extension of binary metric definition to include rhythmic definition is that it provides a more complete description of the movement of a line of poetry than the binary metric alone can provide. The metric of the 03 14 25 14 05 line can be described as a particular example of iambic pentameter in which no-stress grades are 012 and yes-stress grades are 345. The rhythm

is described by the particular sequence of the six stress grades as 0314251405. Moreover, such description of metric and rhythm makes possible the statement of distinctions among lines which would be equated under traditional metric.

For example, a metric can be defined as alternation of lesser with greater stress grades in which the second member of a pair has a larger stress grade than either of its neighbors and receives ictus. By this variety of a "greater than" definition the following "lines" all would fit the defined metric and all could also be reduced to iambic pentameter, but all would have their different rhythms displayed by the six stress grades:

03	14	25	14	05
24	35	34	35	45
12	02	01	02	13

The quality of the grades and of the ratios within pairs are different in these three lines. In the first line the grade of stress at ictus contrasts strongly with the grade of the non-ictal syllable; in the third line that contrast is mild. In the second line the syllables are "heavy;" in the third line they are "light." The three lines would all have a different rhythmic effect. Description in terms of six grades conveys both the metric and the varying rhythmic quality within that metric.

Discussion of the hierarchy of metric patterns, of the Metric Score on which they are displayed, and of the relation of metrics and rhythm is undertaken in three sections: Part I, The Mechanics of the

Score, Part II, The System of Metric Patterns, and Part III, A Note on Metrics and Rhythm.

Part I

Mechanics of the Score

The Metric Score is structured to provide a framework on which the units relevant for metrics, the summed information from the pre-prosodic and the pre-metric analysis and metric theories are all entered in detail yet display their hierarchy and connections. The Eliot and Campion Metric Scores are given on the next pages.

CAMPION
METRIC
SCORE

5-7	[Handwritten scribbles]									
5-6	[Handwritten scribbles]									
5-5	[Handwritten scribbles]									
.....	1	1	1	1	1	1	1	1	1	1
01234-5	3	2	0	3	0	4	0	5	0	5
0123-45	(u)	(u)	(u)	(u)	(u)	(u)	(u)	(u)	(u)	(u)
012-345	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
01-2345	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0-12345	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<>01234-12345	<>	<>	<>	<>	<>	<>	<>	<>	<>	<>
Syllable	na	u	en	ta	ma	is	en	la	ra	z
5-3	Line	5-5	5-6	5-7	5-8	5-5	5-6	5-7	5-8	5-5

<>

Apparent at once in the Metric Score is the familiar framework of the Basic Chart. This frame surrounds a new graph which replaces the first two sound rows. It is clear also that the syllable and word in sound have given ground to the syllable in print whose domain now extends vertically across the axis. Rows S-2 and 3 have gone underground; they are out of sight, but the phonetic properties of their blurred edges and the force of their joins and breaks, as well as the kind of stress potential associated with their units, are present since these elements have been incorporated into the grades of pause and stress potential. The print syllable is extended because it is the basis for metrical counting and the quality of its edge is less often critical in a prosodic count of syllables than in a description of their actual sound. Familiar, too, is the accumulated information from the pre-prosodic and pre-metric analyses. The grades of basic duration, stress, and pause taken from the Basic Chart appear with or between the syllabic columns. Inherent relative vowel pitches, the phoneme keys, and the pre-metric plusses which adjust stress grades are all visible.

Three items remain to be clarified: the change in some of the pause potentials from totals given in the Basic Chart, the graph of stresses above the axis, and the shorthand notation of the metrical patterns at the left of the Score.

The changes which appear in the Metric Score in some of the pause potentials are all prosodic increases for juncture caused by the force of line ends. That the end of a line of verse carries a force for

junction hardly needs proof, but reading a small poem can demonstrate it.

Spring

The sinking sound
 of melting snow
 is heard in all dells
 and the ice
 dissolves apace
 in the ponds.
 The grass flames up
 on the hillsides
 like a spring fire . . .

If the "poem" is read as prose from Walden, however, the reader will undoubtedly smooth over the pauses he probably introduced in the "poem" after "sound," "ice," and "up."

The sinking sound of melting snow is heard in all dells, and the ice dissolves apace in the ponds. The grass flames up on the hillsides like a spring fire ...²

If prose can be turned into "poetry" by visual arrangement, unfortunately much "poetry" can perhaps be dissolved into prose by printing it as such. The visual line, then, exerts some positive force for juncture even when syntax does not support it, as, for example, in this "poem:"

Read this not
 for the sake of
 the
 sense but
 because the
 mind alas
 alas is by
 the eye
 controlled
 often.

If the reader were not forewarned that he might introduce a slight break after "not" or emphasize the isolation of "the" or insert a pause to make "often" an afterthought, he would probably insert all these slight pauses, although he would not introduce any full stop until the end.

Line ends, clearly, add a force toward juncture and are a prosodic feature. Traditional prosodic description of the force of line end for pause is based on the concept that there are two fundamental relations of prosodic line-end pause to pre-prosodic pause potential. Line-end pause either coincides with phrasal break or major stop, or it conflicts with phrasal continuation and is overridden and submerged in the consequent enjambment. The two kinds of force, phrasal join and line-end break, have already been clearly visible on the Basic Chart, but the force of the line ends is not pre-prosodic and is, therefore, not evaluated until the prosodic step. The Eliot Basic Chart has

clearly revealed, for example, the offset structure patterns caused by the line-end interruption of the participial phrases. The Pre-metric Position Chart, a part of the prosodic step, has already included the positions provided by line ends and has given evaluation of the influence of these positions on syllabic prominences. In the Metric Score the weight of line ends for pause potential needs evaluation, because pause potential can affect metric durations.

In the system here, the force of line end is treated as always adding a value of one (-) to whatever pre-prosodic pause potential exists whether that potential is zero or some larger grade. Continuation and joining are here regarded as the basic linguistic condition against which all breaks and pauses are measurable whether such pauses are pre-prosodic or prosodic. Therefore, in the metric step of this system seven grades of pause potential are possible from zero potential to a positive grade of six (-----). The realization of grades in actual speech can be effected, as has already been mentioned, either by silence or by extension of final sound into the space allotted for pause. A zero grade of pause always indicates that there is no break in the continuum, and zero grade is not marked. In the pre-prosodic analysis, grades one and two, (-) and (--), have been described as indicating minimal break or slight extensions, grade three (---), a more marked break, and grades four and five (----) and (-----) a major break or stop. On the Basic Chart, grades four and five show as blank vertical alleys of silence. In prosodic analysis, grades one and two continue to indicate minimal break, but both grades five and six indicate major

break. Grades three and four indicate some medial condition in which extension or pause is slightly greater than the minimal but less than the definite breaks such as those at commas and periods.

In the condition where the prosodic pause potential at a line end is minimal, enjambment is strong and the force toward pause is so faint that it does not exceed that for normal syllabic discreteness. When prosodic pause is five or six at a line end, clear break occurs and the line is end-stopped. When, however, prosodic pause at line end is of medium grade, enjambment exists, but some slight extension of break indicates in sound the presence of the line end. This condition exists, for example, in both the Campion and the Eliot selections. In the Campion the prosodic pause potential after "enlarge" is four (----) and after "discharge" three (---). Enjambment occurs but the final consonant cluster of both words encourages a slight separation and a lengthening of the final syllables which makes the verse end faintly noticeable, although not a full stop. The same kind of condition appears in the Eliot where prosodic pause potential after the line-end participles is either (---) or (----) and the slightest of extension of "ing" or a wisp of silence after it allows the verse end to be indicated without destroying the enjambment.

The prosodic grades of pause provide a description of the third condition which traditional note ignores, the condition in which enjambment occurs but the presence of the line end is heard through it. The prosodic grades of pause become important, furthermore, in the duration adjustments of some metric units. In those cases in

which metric units are relatively large as in strong-stress units of four or more syllables a tendency to isochronism may be needed to retain the identity of the unit. Pause potential can also help to fill those units which have few syllables.

The remaining two items of the Metric Score to be clarified are the graph of stresses and the notation of metrical patterns. This graph of stresses is slightly reminiscent of the tabulation of potential stresses which was abstracted from the Basic Chart as a convenience for counting up each row's contribution to grades of stress potential. Clearly, however, this graph is different, since the row by row source from which stress grade has been accumulated no longer appears, and the number of stresses in a column do not add vertically into the grades above them. Instead, every check marks an occurrence of the particular grade called for by the metric pattern to the left. Those check marks enclosed in curved parentheses are options permitted by the plus adjustments. Those check marks enclosed in pointed parentheses simply show stresses which are greater than their immediate horizontal neighbors.

The shorthand notations for the metric theories define the hierarchy of metric patterns and even in the appearance of the Metric Score something of the order of connection of one metric to the next is visible in the structure of their numbers and in the pattern of stresses in the graph, but a more detailed explanation and demonstration is the subject of the next section.

Part II

The System of Metric Patterns

The metric patterns at the left of the Metric Score form a hierarchical system of binary metrics expressed in terms of six stress grades. This system of metrics clarifies the interrelationships of various traditional metrics and at the same time reveals and defines the dominant metric patterns of any selection. In addition to the metric definition by stress grades, the details of a particular metric can be further explored by DPL strips which can show the kinds of duration relationships possible among the metric units and syllables for that metric.

Demonstration in detail is needed to fully show the interconnected order of the metric patterns, but a brief general description of their rank on the Metric Score can suggest it. The order of the system on the Metric Score begins at the lowest metric, that in which the number of syllables in a line is the unit of measure and is independent of stress as a metric marker. On the Score the number of syllables per line as well as the number of syllables per clause are marked on the P-4 and P-5 rows, respectively, in the right corner of each unit bracket. The order moves across the time axis into the region of sound where stress becomes the unit marker, and the six metrics based on the stress grades encompass traditional syllable-stress and strong-stress metric but interconnect and particularize both. Traditional metric stress is binary; syllables are either not stressed and do not carry ictus or they are stressed and do carry it. The metric

patterns on the left of the stress graph are all based on this concept of metrical stress as a no-yes element, and on the syllable as the stressed unit. However, since there are six grades of pre-prosodic stress to sort into two grades of metric stress, the stress-metric patterns show a hierarchy of ways in which the six can be divided. For each metric, no-stress grades are on the left of the hyphen and yes-stress grades are on the right. The metric in the pointed parenthesis is a metric in which yes-stress is on any syllable greater than its neighbors and no-stress is on the remainder, and its division of stress grades into 01234-12345 allows a wide range. This metric is the most fundamental traditional metric of English but the stress grades show why confusions on the place of ictus are common to it. The next five metrics refine the no-yes division by increasing limitation of yes-grade, and they form a series of steps up from the metrics closest to common metric. In the lowest, stresses are frequent and patterns are close to simple alternations, but as yes-stress grades are increasingly limited to stronger grades, strong-stress metrics begin to prevail. The units of the patterns formed by the yes-stresses increase in length as the metrics ascend until a shift occurs from strong-stress metric to metric based on the primary stresses of phrases and perhaps, finally, to the phrases themselves. At this last level, as awareness of some possible metric unit or mark is relaxed, metric slips into the basic and pre-prosodic rhythms of prose in which the heads of phrases and the junctures dominate the rhythm but are not consciously used as a measure. Thus the Metric

Score shows the way in which measured patterns emerge in a burst of definiteness with sound in the small units from stress to stress and fade slowly back into prose as the units of sound increase between the stresses defined for ictus.

Metric definition depends upon examining two elements, the markers by which metric pattern is defined, and the segments which those marks create. The premise here is that a full metric definition needs to be stated not only in terms of stress grades but also in terms of the durations of stress-marked segments and of the syllables within those segments. The Metric Score does provide definition of the stresses for each metric, but the duration nature of the units remains to be defined. Traditional discussion also begins with the marks which define the unit of measure in any particular metric, but because ordinary metrics are vague in the definition of which stress markers are acceptable as points of ictus, discussion becomes grounded in a fog of argument about stress and ictus. Here, however, the stress grades and the metrical definitions in terms of them clear the air and set the discussion free to proceed to observations of the nature of the relationship of the units of measure into which time is segmented. Any units of time can theoretically be in three kinds of relationship of duration, isochronous, ratioed, or graded. Therefore, the exploration of the metric patterns can extend into duration, not in order to declare prescriptive rules, but to demonstrate the results produced in each metric pattern by proposing to add to it the qualifying condition of each kind of duration relationship in turn.

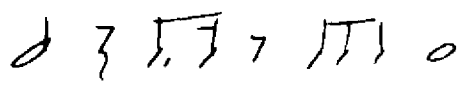
The various metrics differ in their ability to accommodate the three kinds of duration relationship, but DPL strips make it possible to examine the amount of distortion caused by each when imposed on the basic graded pre-prosodic durations. Metric definition is completed, therefore, when in addition to the stress pattern, the nature of the duration relationships are demonstrated to be those which cause the least possible distortion in the three basic grades of syllable durations, yet which permit metric units to retain their identity.

Space does not permit an exhaustive demonstration of the entire hierarchy of metric patterns, and the discussion is mainly limited to a search for the metric definition of the Eliot and the Campion selections, but a few other examples are included to suggest the scope of the system. Since most English metric is founded on the syllable as the unit which builds into other units marked by stress, discussion begins with the syllable as a unit. The metrics in which stress is not the dominant marker show on the Metric Score as those which lie above or below the stress graph, that is, the phrasal units above, the line units below, and these are discussed briefly later.

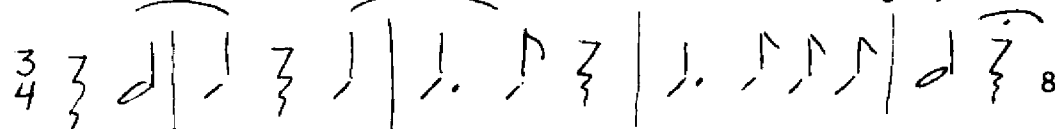
When the syllable is considered as the basic unit which builds into metric, unless it has some assisting marker such as line or stress, no metric is, of course, created. When the duration of the syllable is considered as a basic metric unit on its own, the concept brings to light some of the main false trails in English prosody. The durations of syllables can be regarded as in three possible relationships. Syllables can all be of equal duration, in graded

durations, or in some strict and simple ratios. If syllables are considered as equal in duration, the result is non-English and can be quickly dismissed. If syllables are considered as being in graded relationships the result is English enough, but by itself the grades define only rhythm, not metric. If syllables, however, are considered as being in ratio, then the duration of the syllable is taken as a foundation of a metric and the duration of the shortest syllable becomes the basic unit of measure. This concept gives rise to two misleading notions both of which are basically musical and often result in music notation being invoked to assist description of them. Syllables in strict ratio, however, have been shown to be non-English and along with any notation which implies strict ratios should be dismissed as the basis of English metrics.

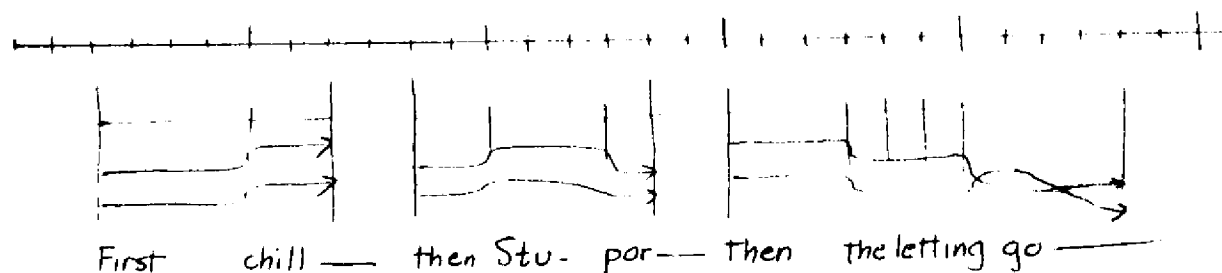
Since ratioed syllable durations and descriptive music notation have been often defended and used they deserve some discussion. The first way in which music notation is used to represent the short syllable as a base unit is tied to classic quantitative metric where the two-to-one ratio can be expressed by $\downarrow \downarrow$ or $\downarrow \uparrow$, and there is nothing to prevent the use of this notation so long as the theory is believed in,³ but when the concept is tied to the syllable-stress metrics of English by carrying over the classic ratioed durations, it is misapplied.⁴ English meter is not quantitative in the classic sense although its syllables vary in length and although traditional criticism admits that the poets make use of the variations in their

rhythms.⁵ English verse may, however, approach ratios in a limited number of rhythmic song verses, ballads, march songs, jingles.⁶ The second use of music notation is tied to impressionistic description of language rhythms and poetry rhythms when they seem to have pattern and yet vary widely away from the simple metrics.⁷ When some such notation as  is invoked for descriptive purposes the base unit becomes the smallest, the duration of the shortest syllable. Complex music notation is always an indication that a rhythm is felt but that metrics of any available kind fails to account satisfactorily for that rhythm. For example, Gross's notation of Emily Dickinson's line:

First chill — then stu- por — then the letting go —



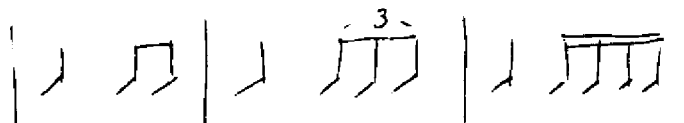
gives a possible reading of the line, but music notation is merely a too exact way of recording a rhythm which is present but which may not measure thus precisely, and even strong strictures that a music notation is merely an approximation or remarks that the words fall something like the notation generally fail to remove the conditioned response to music notation as indeed exact. Translation to DPL, however, gives the same duration and stress information without the misleading exactness and it clearly separates isochronous theory from basic data.



When the precise durations given by Gross are translated into DPL in which exactness of ratio is not implied, the result appears in the graded syllables and junctures which are inherent language components, but the metric theory, the isochronous bar of the music notations, is separated out so that theory is clearly isolated from basic potential. It is possible that complete pre-prosodic analysis might give syllabic duration grades resembling the exact durations Gross gives, but it is doubtful if any basis would be found for the precise duration equating of, for example, the three syllables in "the letting." The lexical accent on "let-" and the pre-metric weight of the assonance in "then," "then," and "let-" would probably combine to raise the stress grade of "let-" so that it would receive more duration than its neighbors.

Music notation is therefore misleading, not only because the duration details may be too exact, but because it tends to conceal rather than reveal the prosodic theory behind it. That is, the inclusion or omission of bar lines implies very different theories. When bar lines are omitted, the isochronous unit becomes the shortest syllable, and the location of stress is not indicated unless vaguely by the longer durations, but when measure bars are used, the measure

rather than the short syllable is apt to become the isochronous unit because a measure can be divided in the same selection into either two or three syllabic units, or even more, so that the shortest syllable disappears as the basis of measurement. For example, in



the shortest note is the "sixteenth" but its duration relation to one of the notes in the triplet is precise but not simple, whereas the relation of various short syllables may be complex but not precise. In addition stress enters into the complexity because the isochronous measures are not built out of syllabic duration, but are notched out by stress as a marker which divides time into segments. Therefore, music notation without the bars is a way of indicating rhythm and with the bars a way of indicating an isochronous meter with an implied stress after each bar line, but the first is deceptive and too rigid for general use and the second should be used at best only with strongly pulsing song-based verse. Music notation is therefore misleading and the ratioed durations of syllables which it implies do not provide an English metric. The syllable needs to be combined with some other mark to create a metric unit, and that mark in English is stress.

The consideration of music notation by bar has introduced the notion into metric of stress as a marker and brings the discussion to the no-yes stress patterns of the Metric Score in which the syllable unit is combined with stress. The consideration of music notation

for complicated rhythms has introduced shades of stress and shades of duration and brings discussion to the division of the many shades of stress into two grades of metrics and the adaptation of basic durations to prosodic durations. If there are only two relevant grades of stress in stress metrics the problem is, what becomes of the many potential phonetic grades?⁹ If they are tossed away in performance, then basic data have been destroyed for the sake of theory and what is present in a performance does not then include the subtleties of rhythm but only the crude beat of scanning. If the phonetic grades are retained, the problem is how so many can be implemented and what becomes of the identity of the metric unit. Stress, however, is a complex, not merely a loudness. It includes three parameters and can be indicated, according to the acoustic phoneticians, by obtrusive movements in any single parameter or pair of parameters as well as in all three. There are seven possible gross combinations of movement in the parameters and many shades of relationship among the parameters when combined so that it seems language has the resources easily to realize six shades of stress. But the identity of the metric unit must be phonetically marked or rhythm alone is present, and it can be so marked by the predominance of some of the stresses and perhaps also by some adjusting of durations to keep a sense of the unit, thus retaining both the rhythm in the various grades of the stresses and the metric by some shaping of the unit duration so that both rhythm and meter are present at once.

Examination of the Campion and Eliot selections in terms of each of the stress metric patterns of the Score in turn show which patterns best define and fit each selection. Supplementary DPL strips then show how the durations of syllables and metric units may be adjusted to make that particular pattern function.

The hierarchy of stress-metric patterns show the divisions of the six grades of stress into the no-yes binary stress of traditional metrics.

no-stress - yes-stress

01234-5
 0123-45
 012-345
 01-2345
 0-12345
 01234-12345

The most general pattern, the common denominator metric, is the pattern marked $\langle \rangle$. This metric is the "greater than" metric which is defined by the stipulation that metrical ictus be on that syllable which has a stress grade greater than its immediate neighbors. The widest latitude for grades of stress in metrics is in this general "greater than" metric in which any one of grades 01234 can be no-stress, the unstress of binary metrics, and any one of grades 12345 can be yes-stress, the stress of binary metrics. The other metrics of the system can all be limited sub-classes of this common metric and cover traditional iambic, trochaic, dactylic, and anapestic meters with their combinations and exceptions, and those with yes-stress of higher stress grades can also be strong-stress metric. Various shaping devices are added to these

metrics concerning the number of syllables in a line and lines in a stanza but these qualifying shapes are visible to all and do not raise severe problems of analysis. The source of traditional difficulty in discovering or applying a metric for any particular selection lies in the problem of reducing the pre-prosodic variety of stress to binary stress. There are occasions in which the syllables so vie with each other that decision on ictus is difficult or in which a syllable is so weak that it hardly supports the ictal fall of some recurring stress pattern.

When the graded stresses of the Campion and Eliot are considered under the "greater than" $\langle \rangle$ metric, the Campion clearly falls into alternations and a short unit from one "greater than" stress to the next "greater than" stress appears and promises to keep a metric identity. In the Eliot, however, although stress grades show interesting distribution in the "greater than" metric they do not reveal any clear pattern. Demonstration, then, of the working of six stress grades in the "greater than" pattern is here done using the Campion as an example, and the Eliot is set aside until progress through the hierarchy of patterns comes to a division of grades which reveal a pattern in the Eliot.

When the stress grades of the Campion (for the moment without the pre-metric plus adjustments) are examined under the "greater than" metric an alternating pattern appears in which the stress grades of the second member of every pair (except the first pair) is greater than its neighbors. By definition these "greater than" stresses

receive ictus. The no-stresses are all zero except in the first pair, and the yes-stresses are grades 2345. The Campion, therefore, fits the $\langle \rangle$ 01234-12345 metric and is a limited case of it definable as 0-2345 with one exception, pair 32.

3	2	0	3	0	4	0	5	0	2	0	5	0
Now	win	ter	nights	enlarge	The	num	ber	of	their	hours;		
0	4	0	3	0	5	0	3	0	3	0	5	0
And	clouds	their	storms	discharge	Upon	the	ay	rie	towres.			
32 03 04 05 02 05 0												
04 03 05 03 03 05 0												

The palette of pairs used as units is thus limited to:

02	exception
03	32
04	
05	

This metric is a sub-form of the third metric pattern on the Metric Score, 01-2345. When the pre-metric plus adjustments are honored, a few no-stresses become grade one, the metric expands to 01-2345, and the palette is slightly increased by two pairs:

13
15

The variety added by the refinement of the adjusted stress potential prevents monotony but the metric of the Campion is as limited, orderly, and square as the structural blocks shown in the position chart. Traditional metrics would identify the selection as iambic, and so it is, but the disposition of the six stress grades reveals not only the iambic alternation but shows that the kind of iambic is limited. The

stress textures of the pairs are fairly similar in that no-stress grades are all low. The interesting feature of the sound, the beauty so often granted to Campion's poetry, perhaps lies less in the simple metric pattern itself than in the vowel pitches and tonalities which flower within that metric.

The 01-2345 division of stress grades provides an alternating metric that seems to fit the Campion, but a full metric solution in this system demands definition of how the three pre-prosodic grades of syllabic duration adjust to the short metric unit. Previous analysis in Chapter III has shown that syllables of equal duration are un-English, and the discussion of musical ratios has shown that strict syllabic ratios are limited to a few special kinds of song verse. The only remaining relationship of syllabic durations is some graded relationship. However, it is clear that if the Campion were performed by the three basic grades of duration and the six realized grades of potential stress, that the unit from "greater than" stress to "greater than" stress would be felt to some extent since the alternation is firmly built in, but it would also be possible for the high grades of stress to create the sense of a longer unit which might submerge the smaller. For example, two stronger stresses appear in every Campion line. These stresses are so placed that a large unit marked by them can emerge.

(3++) 2 0 3 0 (4++)
 Now winter nights enlarge
 0 (5) 0 2 0 (5) 0
 The number of their houres
 0 (4+) 0 3 0 (5)
 And clouds their storms discharge
 0 (3+) 0 3 0 (5) 0
 Upon the ayrie towres

Therefore, to prevent this unit from becoming the dominant metric, some slight adjustment of durations is needed to mark the short unit formed by the alternations. The short unit from stress to stress in the Campion selection is traditionally called an iambic foot and can be called so for convenience although the term carries associations which have been confusing to English prosody over the years. This duration of the foot unit itself can be considered two ways, either as an edifice whose form is the result of the form of the base blocks, the syllabic durations, or as a cover unit whose duration form controls that of the syllables within it. In the first case the resulting foot units are not apt to be in any more rigid relation than graded; in the second the feet could be either isochronous or of various graded sizes. Exploration of the duration possibilities and their results in the Campion are projected in flat DPL strips. Isochronous feet,¹⁰ and basic DPL strip with the pre-prosodic three grades of syllabic duration, are easily represented. Less clear is

the way to effect a compromise between them in which neither rhythm nor metric takes over full control and masks the other.

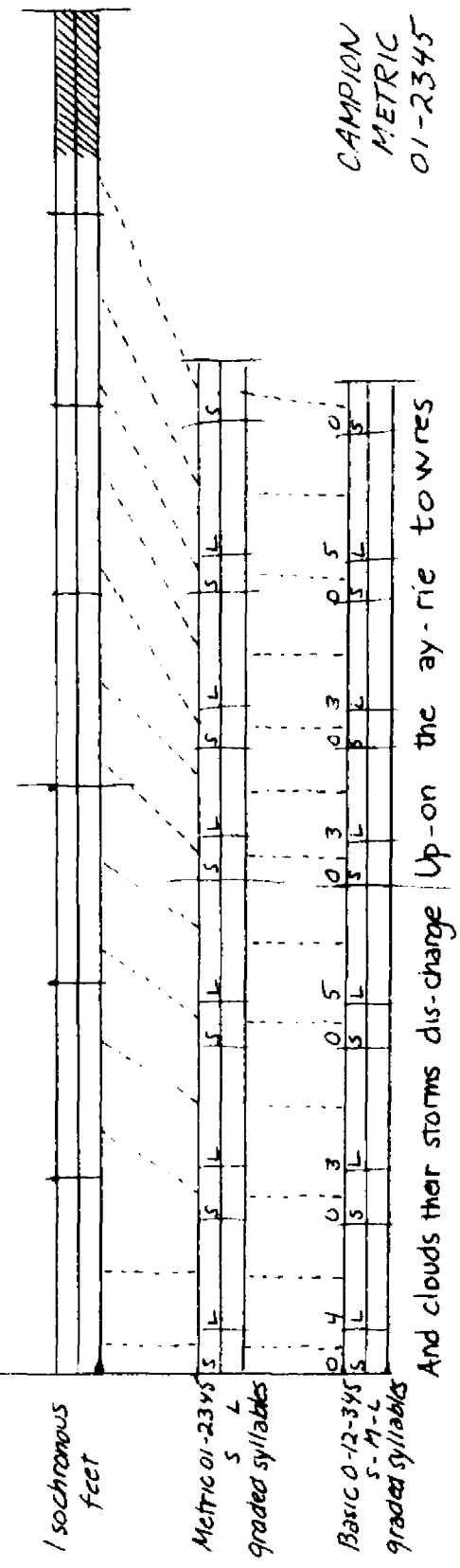
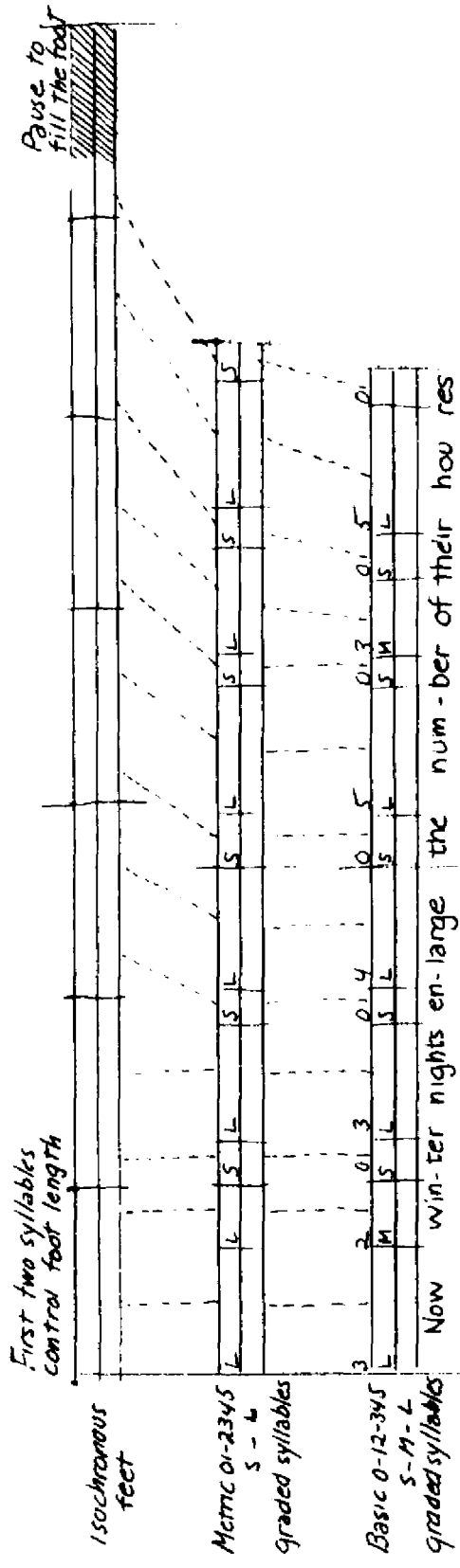
The stress grades provide an answer. For pre-prosodic analysis they give a working set of three potential basic grades of duration by the formula:

$$\begin{array}{rcl} 0 & = & S \\ 12 & = & M \\ 345 & = & L \end{array}$$

This stress-grading can be adjusted according to the metric pattern 01-2345 into two grades of duration.

$$\begin{array}{rcl} 01 & = & S \\ 2345 & = & L \end{array}$$

However, since these are grades, not ratios, the duration of a short and a long can be almost equal, or they can each approach a medium. The distortion, therefore, needed to preserve both the isochronous foot (always only approximately) and the basic grades of duration is small. The projection shows the foot units with syllables of the *Campion* in three kinds of grading: in the three pre-prosodic grades of duration, in two metric-pattern stress-graded durations, and in isochronous foot-controlled durations. Note that for the isochronous feet, pause, which can be traditionally by-passed in graded metrics, becomes essential.



CAMPION
METRIC
01-2345

Thus it is seen that if the feet are regarded as isochronous as shown in the top strip, the three basic syllabic durations suffer some distortion through extension, although not much, but if the syllables are merely in two duration grades as shown in the center strip, they suffer very little duration distortion, yet do keep the sense of the unit in force. Therefore the units of an alternating 01-2345 are served by grading the duration of stresses according to the metric division with 01 grades as shorter (S) and 2345 grades as longer (L). So far, then a metric has been found which coincides with the stresses of the Campion. The rhythm, however, within the metric can still be adjusted and there may also be some other possible metric among the remaining patterns, although 01-2345 in durations graded by the two-way division can be checked on the Score as one solution.

It might be argued that the choice of a duration guide is purely a performance decision, but it is a pre-performance and prosodic matter because it searches out that solution which embraces both metric and rhythm. A performance choice of pure isochronism for this metric stifles rhythm for the sake of meter and approaches scanning; a choice of pure basic grade stifles meter for the sake of rhythm and approaches prose. Neither, then, is the solution which conveys as much as possible of the prosodic potential and both are considered not as performance choices but as prosodic choices. Performance choice consists of the delicate adjustment of voice quality and of proportion within the graded durations.

Although isochronous feet are not suggested as the metric solution for the *Campion*, the dislocation a reading by them would create is small and occurs primarily where basic grades make several feet differ from the pervasive SL, that is, at the LM foot, the long-medium "Now win-," and the SM foot, the small-medium "-er of." However, in the kind of iambic verse which is formed on the full range of stress potential and which contains combinations as different as 01 and 45, some squeezing and pulling would be necessary to force feet into the Procrustean bed of isochronism. The combination possibilities of the six potential stress grades and the three potential duration grades contain forces of inequality which work against equal feet. A few tables show these forces:

fifteen pairs of stress grades	six pairs of duration grades	all to be reduced to one kind of pair
01 12 23 34 45	SM MM ML LL LL	SL
02 13 24 35	SM ML ML LL	
03 14 25	SL ML ML	
04 15	SL ML	
05	SL	

The tables reveal the extreme reduction of shades and degrees which is concealed under the simplicity of the statement that like feet are isochronous. Yet the common metric of English is the "greater than" metric with stresses 01234-12345, and end-stressed pairs or iambs are its most common feet. In it the full palette of pairs is available to the poet, and it seems likely that if the inherent variety of grades within the feet is very great, the distortion caused by the imposition of isochronic feet would also be great. Therefore, even

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04 15	SL ML	
05	SL	

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if foot isochronism were chosen as a basis for reading, decisions would not be over, nor the problem be solved, because where a single line might suffer little from a steady foot beat, a passage of several lines would be distorted by it. Line tempos, too, can change. Pope's much-used example, when put into a quick form of the Basic Chart proves it at a glance even without adjusted pre-metric weights, and, in addition, shows both the foot variations and the rhythm within the metric.

When Ajax strives, some Rock's vast weight to throw,
 The line too labours, and the words move slow;
 Not so, when swift Camilla scours the Plain,
 Flies o'er th'unbending Corn, and skims along the Main.¹¹
 11. 370-373.

1 5 2 4 2 3 2 4 0 4

S-4N
S-4D
S-3
S-2
S-1 venētdzæksstrāivz, sāmra'ksvæstvēit tæθrōū

Basic Durations
0-12-345
S M-L
ML ML ML ML SL

0 4 4 5 1 1 0 2 3 4

S-4N
S-4D
S-3
S-2
S-1 ðælāin tū lēibarz, ændæawerdzmū vslōū

SL LL MM SL SL

2 4, 0 1 0 3 0 2 0 4,

S-4N
S-4D
S-3
S-2
S-1 nā'tsōū wenswiftkæmilæskæūzæp lēin

ML SM SL SM SL

2 3 0 2 0 4, 0 2 0 3 0 4,

S-4N
S-4D
S-3
S-2
S-1 flæzōwærdæn bænditjks'm, ændskæmzals ŋðæmēin

ML SM SL SM SL SL

POPE
QUICK
BASIC
CHART

Pope is building lines with syllables in alternating $\langle \rangle$ "greater-than" metric, and clearly does not consider the line duration as a covering control. Pope's "laboring" lines correlate with high stress grade potential, and the "swift" lines with the low. Even the transcription symbols show something of the contrast in length, and Pope has used all the possible grades of the metric. There are no-stress syllables with 01234 and yes-stress with 12345 and his palette of pairs is far larger than Campion's. Of the possible range he uses:

01 -	23	34	45
02 -	24	-	
03 -	25		
04	15		

and one pair, "too la-", has a major pause in it as well as before it. The stress potential of the pairs ranges from one to six in the Pope, whereas it varies only from three to five in the Campion. Clearly, the rhythms of the two are different and the potential stress grades help reveal the difference. Pope has made use of every device to control durations. In his long lines vowel quantity is long, syllables are forced apart by intractable clusters, major juncture, and by ambiguities like "weight to" and "moves slow" where juncture is necessary to prevent hearing "way to" and "moves low." In the short lines, despite the major juncture and extra foot, the number of segmental sounds are fewer, and syllables run together. Most of these characteristics have long been noted and admired, but the Basic Chart discloses how these properties add together to build different stress

weights and duration grades and through Pope's extreme example show the reason that isochronism in feet is to be applied with discretion and is mainly a matter for performance, and why Lanier's isochronous foot measure has limited application. The example, furthermore, demonstrates the connection in fact between the grades of stress potential and durations.

It should be pointed out, too, in justice to Pope, that, though he has made the sound echo the sense, in that the slow and fast tempos echo the slow and fast actions described in the lines, he has done so by control of the sound separate from the meaning as the analysis in the Basic Chart shows. His effect is not an illusion created by any psychological disposition in the reader to believe in heard echoes which have no physical basis, and it is Pope himself who has also declared his intention and explained the metaphor of connection by his own lines so that the critic has no metaphoric activity. All he can do is admire the poet.

If ratioed units of all kinds are set aside and isochronism for like feet is of debatable merit, "graded" feet are the remaining possible kind and are traditionally held a measure of rhythm in English iambic verse, although they are not considered under that precise term. The medium grades are the most likely, however, and deviations from feet of the medium grade, the noticeably "long" and the markedly "deficient" or "weak," are seized upon for discussion in criticism and are viewed as either interesting or unpleasing departures from

some vague duration and prominence norm.¹² The Campion selection can, of course, be checked on the Score as an example of graded iambic feet where all are medium, one is short (02 "-er of"), and the Pope, if it were to be scored, could also be marked as an example containing graded feet which have been consciously employed and arranged from small to large, with humor, skill, and effectiveness.

Both the Campion and the Pope are varieties of iambic or alternating "greater than" < > 01234-12345, although the Pope uses the range and the Campion functions within the limited 01-2345. If the common metric is extended to permit full range of two and three syllable feet then the palette is greatly increased.

spondees	trochees	anapests	dactyles
11	10 21 32 43 54	001	100
22	20 31 42 53	002	200
33	30 41 52	etc. to	etc. to
44	40 51	forty five	forty five
55	50	combinations	combinations

It is clear then why the metric need never be monotonous and why discretion is needed to keep pervasive the end-stressed pairs as the dominating metric. Some kinds of substitutions are known through much experiment and analysis to appear and to "work" in certain positions, as for example, the initial spondee or trochee, and some combinations are probably of low frequency, but the metric of any iambic passage can be described in terms of the actual stress-grade pairs, the palette, and the exceptions. For example, it would be possible for an iambic

passage to show less range than the Pope and more than the Campion and have a description and definition such as:

0123-2345 in end-stressed pairs

- - 23 34 -	exceptions
02 13 24 -	42, 54, 001
- - -	
04 15	
-	

Similar definitions can be made for traditional metrics, that is for any selection for which the "greater than" line on the Metric Score shows yes-stresses with at least one and no more than two intervening no-stresses, so that dactylic, anapestic, trochaic verse with substitutions can all be described. For example, it would be possible for a trochaic passage to have a definition such as:

0123-2345 in fore-stressed pairs

20 - 32 -	exceptions
30 - 42 53	401, 302, 4
40 41 -	
50 -	

When, however, there are three or more intervening syllables, as in the Eliot where there are four, problems arise.

Exploration of the metric patterns in turn, brings out that the metric of the Eliot is not a "greater than" but a strong stress metric. Analysis of the Eliot by "greater than" metric creates units from "greater than" stress to "greater than" stress which do not satisfy the rhythms of the language. For example, the $\langle \rangle$ metric of the Eliot, if no grades are adjusted by the plusses, has an overlapping range of 0123-2345 and, since the disposition of the first

few grades suggest it, probable fore-stressed units. The major pauses break the metric so that the "greater than" rule does not force itself across if there is any disagreement, precisely as in the *Campion* it does not force alternation across the break between "houres" and "and clouds." The definition of the Eliot in unadjusted grades is:

0123-2345 in fore-stressed units

and the palette is:

20 302 4 5
 3202 40 50
 401
 40110
 412

The units are, in order by line:

50 50 40110 412
 20 3202 5 4
 401 4 30/2
 4 30
 40

and the word broken into units according to them are:

April	Lilacs	Memory and de-	roots with spring
is the	out of the dead	sire,	rain.
cruellest	land,	stirring/Dull	
month,	mixing		
breeding			

A test-reading by these units does not satisfy the reader's sense of his language's rhythms in three of the units: "out of the dead," "stirring dull," and "roots with spring." The final adjectives suffer

a peculiar reduction if the reader is reaching for the strong stress of the next unit. When, however, the pre-metric double plus adjustments raise grades, satisfactory units do appear. The metric emerges not as "greater than" metric, although close to it, but as what is commonly called strong-stress metric where the stronger stresses mark and control the unit. In the Eliot selection the strong or yes-stresses are 345, and the weaker or no-stresses are grades 012. There is a single two-plus on "is" and it can be put in either group. If it is put in the yes-group the metric becomes:

strong-stress 012-345				fore-stressed units
50	50	50110	(3)	exception
20	320	5	(5)1	2+
401	(3)	4 (1)	3	
(5)	(5)		4	
4 (1)	(4)(1)			

and the words broken into units according to the strong-stress units are:

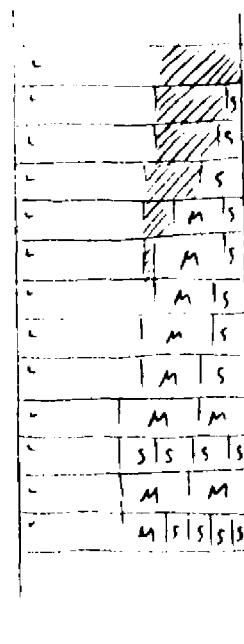
April	Lilacs	Memory and de-	Dull
is the	out of the	sire,	roots with
cruellest	dead	stirring	spring
month,	land,		rain
breeding	mixing		(13)

If the two-plus is aligned in the no-group, the first line is altered.

April is the
 cruellest
 month,
 breeding

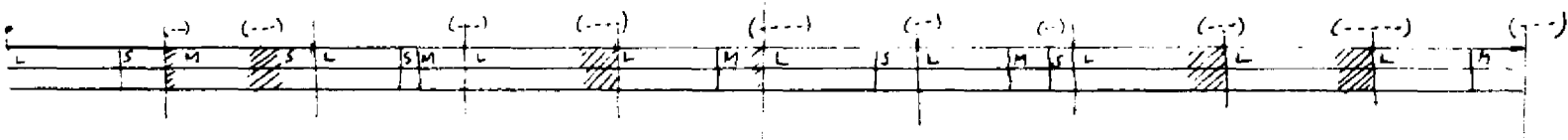
But in either arrangement the metric satisfies what linguists term the native speaker's sense of his language as well as the inherent potential in the selection shown by the stress grades and it coincides with potential in a pattern definable in economical terms. The metric is strong-stress, not hammered down with alliterative spikes as in the old alliterative verse, but, nevertheless, supported by many small nails of repetition as the adjusted grades from the pre-metric chart show.

The problem once the metric is established is, once more, the decision between isochronous strong-stress units or units graded by the syllable lengths within them. A projection diagram in DPL shows the several possibilities. The central strip is the basic strip which gives a prose reading and shows syllables graded into three durations by the basic formula 1-23-345 = S-M-L. The lower strip shows the syllabic durations graded by the yes-no division of the metric 345-123 in L-S, and the top strip shows the fore-stressed or trochonic¹⁴ units as isochronous but the syllabic durations left in the basic three grades. Pause potential is used to aid the isochronism, and indeed is essential to it. The metric has trochonic units from one to five syllables but with three basic grades of duration and numerous shades of pause potential. Isochronic units of many delicate varieties are possible as the ladder of interior durations shows.

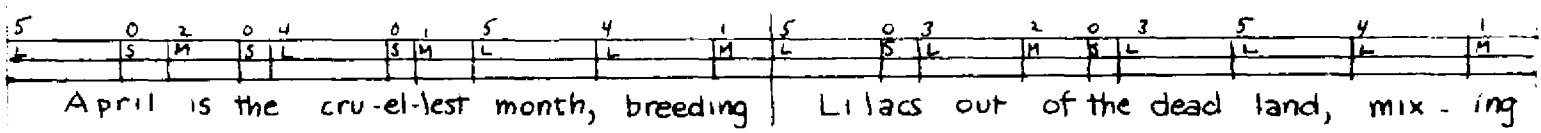


First two syllables
control unit length

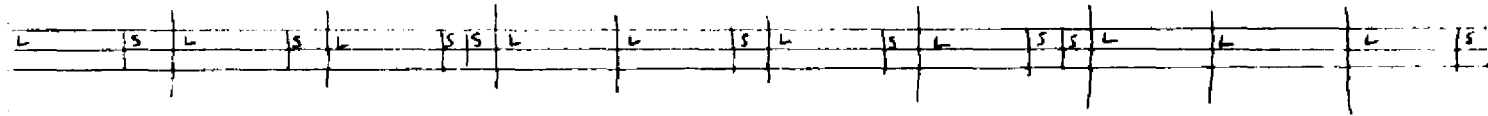
Isynchronous
trochaic
units



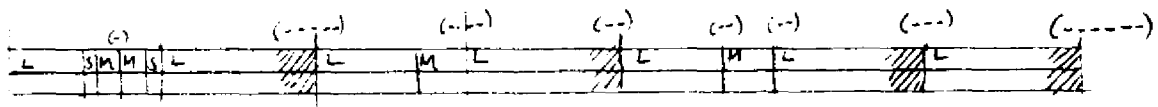
Basic
0-12-345
S-M-L
graded syllables



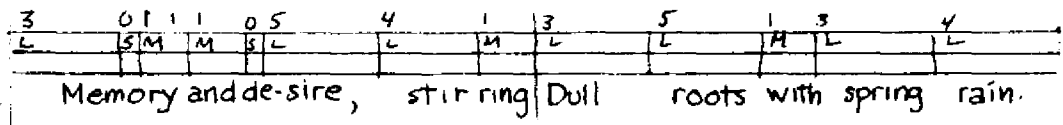
Metric
012-345
S-L
graded syllables



Isynchronous
Trochaic
units



Basic
0-12-345
S-M-L
graded syllables



Metric
012-345
S-L
graded syllables



ELIOT
METRIC
012-345

Reducing the number of duration grades of the syllables from three to two distorts; keeping basic grades without regularizing the unit is prose; but keeping the basic grades and giving a sense of the unit by an approach to isochronism makes a metric according to the definition of this thesis and incorporates both inherent language potential and a unit of measure. The isochronism does not need to be and probably never could be absolute, but in contrast to iambics where isochronism of foot is not needed, the strong-stress metric demands a discriminating mark to separate the stronger from the weaker stresses and to set off the units. The strongs can be made "stronger" but that is a performance preference outside of the metrics based on six grades of stress potential.

The use of the pause potential in the strip of isochronous trochonic units is simple. Larger grades of major pause are given silence or extension of the preceding syllable into silence, and the minor potential grades of pause are utilized if the syllables within the unit are basically short, but where there is no need for minor pause it is absorbed in the sound. Pause, then, helps equalize but never needs to be obtrusive as the strips show.

The grades of pause potential have an important function in determining whether a metric is fore or end-stressed once the units are found through the stress grades. Pause potential which constantly fractures one kind of unit demonstrates that they are not the pervasive unit of the selection. Proof is quickly visible if the Eliot and

Campion are arranged by the units of their metric with the yes-stress taken as fore-stress in the left column of units and as end-stress in the right column of units. End-stressing fractures the Eliot; fore-stressing fractures the Campion.

April (--)	Ap-
is (--) the	pril (--) is
cruellest (---)	(--) the cru-
month (-----)	ellest (---) month
breeding (----)	(-----) breed-
lilacs (--)	ing (----) li-
out of (--) the	lacs (--) out
dead (---)	of (--) the dead
land (-----)	(---) land
mixing (----)	(-----) mix-
memory (--) and de-	ing (----) me-
sire (-----)	mory (--) and desire
stirring (----)	(-----) stir-
dull (--)	ring (----) dull
roots (----) with (--)	(--) roots
spring (---)	(----) with (---) spring
rain (-----)	(---) rain
	(-----)

Now (-)	Now (-) win-
winter	ter nights
nights (-) en- (-)	(-) en(-)large
large (----) the	(----) the num-
number (--)	ber (--)
of (--) their	(--) their heures
heures (-----) and	(-----) and clouds
clouds (----) their	(----) their storms
storms (---) dis-	(---) discharge
charge (---) up-	(---) upon
on (--) the	(--) the ay-
ayrie	rie towres
towres (-----)	(-----)

In the Eliot, the units, when regarded as fore-stressed, are broken only once by a larger grade of pause. There is a pause potential of four (----) after "roots." The other three interior pauses are minimal grades of (--). All the units hold together well and only after "roots" does any pause occur which might work against the cohesion of the unit. The units, regarded as end-stressed, go against the grain of the language as is demonstrated by the many pauses which break them. In the Campion, it is the end-stressed units which hold together, and the fore-stressed units which are almost all broken by pause.

Experiment thus far with the various metric patterns in turn has shown that Campion is a variety of < > 01234-12345 within the limited

01-2345 division and that the Eliot does not fit a "greater than" metric, but does fall into a strong-stress metric of 012-345 where stress grades 345 mark and control the unit. Experiment with the durations of units and syllables has shown that the Campion units, end-stressed pairs, hold the sense of metrical unit with least distortion when the first members of a pair, stress grades 01, are given durations shorter than the second members with grades 2345. Duration experiments show that the Eliot units, fore-stressed units of one to six syllables, hold the sense of metrical unit with least distortion when the units approach isochronism. The three basic grades of syllabic duration and the grades of pause potential can serve to roughly equalize the units.

Experiment with the various metric patterns brings the investigation of the hierarchy to the last two stress metrics in which the six grades of stress are divided for binary metric into the groups 0123-45 and 01234-5. When grades 4 and 5, or 5 alone, are considered as the place of ictus and the mark by which metric units are measured off, no metrical pattern emerges in the Eliot. If grades 4 and 5 mark units in the Eliot, the resulting units vary wildly in size; if grade 5 alone marks units, the resulting stretches are too long to hold together. The Campion, on the other hand, shows more possibility, and a metric with long units, already described as a threat to the alternating metric, can be seen in a division of stresses by the 0123-45 pattern. End-stressed iambadic units emerge:

end-stressed 0123-45

—— (4)

2030 (5)

— 0 (5)

020 (1) (5)

(1) — 0 (4)

(1) 30 (5)

—— 0 (4)

030 (5)

(1) ———

The spaces indicated by line have major pause potential to fill them, and in such long groups the minor pause potential is inconsequent. The words and major pauses of the units are:

Now

winter nights enlarge

(----) the num-

ber of their hou-

res (-----) and clouds

(----) their storms discharge

(---) upon

the ayrie tow-

res (-----)

The peaks of the end-stressed units seem to be at vowel nuclei rather than at initial consonantal attack of the last syllables.

It is not necessary to carry out DPL strips to see both that some approach to isochronism is involved and that the metric allows the rhythm of the phrase and the line as well as the undercurrent of alternation to exist within the unit. Moreover, there is room for the vowel melody. For example, there is time to execute the rise to and the movement in "ayrie" and the plunge to and the movement in "towres," as well as to give "-large" and "-charge" the time which all the interlocking echoes build into them¹⁵

The domain of the syllable fades after these last stress-grade patterns on the Metric Score into the domain of the phrase. A last faint metric is possible, marked by the primary stresses of each phrase. Such a metric is an extension of the principle of "strong-stress" where the strongest or yes-stress is defined as the primary, and to keep the sense of unit demands strong isochronism. Both the Campion and the Eliot show a fair regularity of primaries at the S-4N row, but the Campion is not improved over the 0123-45 metric by imposition of the primary stress metric because the unit destroys the lines and creates an uncomfortable rush in the last group.

Iambadic primary-stress units:

Now winter nights
 enlarge The num-
 ber of their hou-
 res; And clouds
 their storms discharge
 upon the ayrie tow-
 res.

Primary stress measure, however, is more than experiment upon paper. It is founded upon an inherent property of English which has been described by various linguists as the tendency for English rhythm to compress or stretch syllables in such a way that an isochronism from one important stress to the next occurs, although not all agree on how to determine the important stresses¹⁶ and not all agree on the actuality or the extent of isochronism.¹⁷ Nevertheless, there is strong evidence that equalization from one major stress to another does tend to occur. A reading without awareness of primaries or of reaching for isochronism between them would be prose if no other metric were present, but if a conscious reach is made for such isochronism, then a metric exists which satisfies the definition of this thesis. It allows the inherent phrasal and syllabic rhythms and grades, yet keeps the sense of a unit of measure.

The Eliot in trochonic primary-stress metric units is:

April is the cruellest
 month, breeding
 Lilacs out of the dead
 land, mixing
 Memory and de-
 sire, stirring Dull
 roots with spring
 rain.

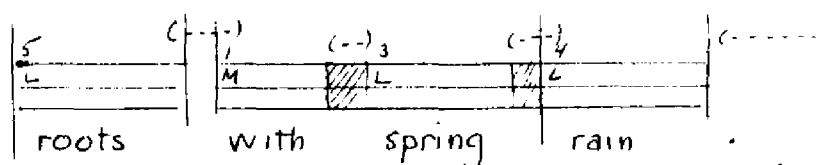
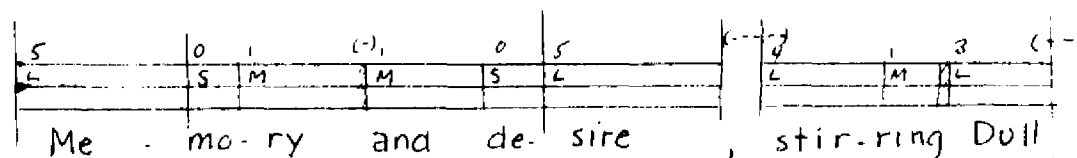
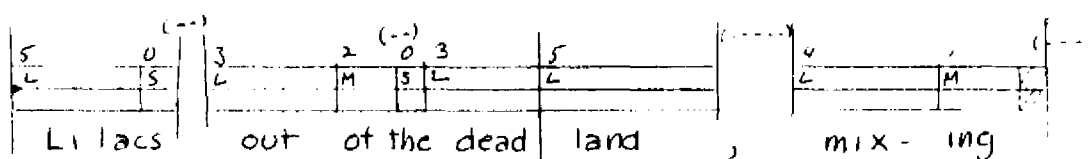
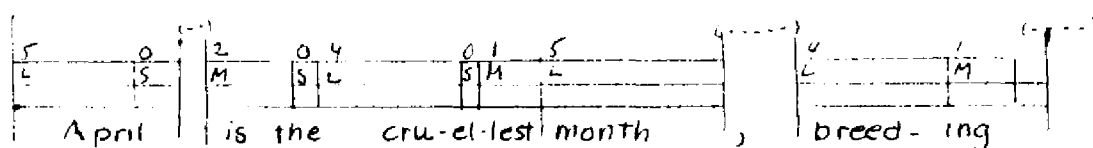
It is possible to get some idea of the duration of these segments more or less as they might be rendered in ordinary speech when no conscious attempt for isochronism is being made. In the Shen and Peterson article Martin Joos suggests as a check on the method of measuring durations that an addition be done of "time for segmental phonemes, plusses, and terminals to get total time," and he allots 5 centiseconds for each segmental phoneme, 2 1/2 cs for plus junctures, and 10 cs for terminal junctures (my potential and major junctures).¹⁸ He counts /+/ junctures between all words and at syllabic consonants. To estimate the length of the primary stress measures, Joos' figures can be put to use, and the results show that the Eliot segments are not likely to be isochronous in ordinary utterance.

April is the cruellest	103.5
month, breeding	67.5
Lilacs out of the dead	92.5
land, mixing	62.5
Memory and de-	65
sire, stirring Dull	75
roots with spring	72.5
rain.	22.5 (Incomplete, but more follows in the poem.)

Nevertheless, an isochronous reading is possible, effective, and should be checked on the Eliot Score. A flat DPL strip gives a picture of the durations of such a reading by the three basic duration grades founded on a 0-12-345 stress division and with pause used.

Since each phrase is a kingdom to itself, great flexibility of syllabic duration overall can occur. A medium in one unit may equal or surpass a long in another.

← isochronous primary stress unit →



Adjusted Stress Grades

BASIC

0-12-345

S-M-L

ELIOT
PRIMARY STRESS
METRIC

In this measure a clear pattern of repetition and shape emerges in the Eliot. Compressed and open units alternate and there is a resemblance among members of each set. There is sufficient pattern to please the desire for stability and structure and there is a sufficient variety and complexity to please the desire to escape the banal. This metric emerges from the Eliot and is, of course, a metric close to the rhythms of ordinary conversation which are generally mentioned by critics as the felt rhythm of the lines.¹⁹

For both the Campion and the Eliot selections there are two possible metrics. There is a stress metric in which stresses which receive ictus are fairly close and of several grades, but there is also a stress metric in which grades of stress which receive ictus are high and further apart. Traditional metric definition includes only the description of the smaller units, but metrical definition of any selection can be made more particular by including the description of the larger units which emerge. The large units of the Campion and the Eliot differ in quality. The Campion large units are a form of limited "greater than" metric still within the hierarchy of binary stress metrics, but the Eliot large units are a form of phrasal unit far closer to prose and they permit the three pre-prosodic grades of syllabic duration.

At the last metric at the top of the Score, metric fades into the unmeasured rhythm of the language. At the bottom of the Score the last peripheral metric remains to be discussed. This metric uses the verse line as a unit. Of English verse it could be said

that a metric based on the line alone, if such a metric were possible, can only be one in which metric fades into the visual, for if the measure of the line does not depend on and break into syllable units, or phrase units, or stress-marked units, then it can depend only on the way such units are fractured by the arrangement in the white space of the page. For example, in the *Campion* lines the number of syllables to a line forms a pattern of 6, 7, 6, 7, so that the line is not functioning as metric independent of a syllable-count pattern. There are also three pairs of alternating stress in each line so that the line is not functioning as a metric independent of stress count. It is not easy to find verse lines where some repeating pattern of syllable or stress by lines does not appear. Perhaps *Skeltonics* are an example, although a search is always on to establish a stress pattern in them. But it is possible to break up *Campion's* lines so that neither syllable nor stress patterns emerge and so that the line becomes a strong independent unit marked by its arrangement on the page.

	yes-stresses	syllables
Now winter nights	2	4
enlarge the	1	3
number of their	2	4
houres	1	2
And clouds	1	2
their storms	1	2
discharge upon	2	4
the		1
ayrie towres	2	4

In such an arrangement neither stress nor syllable count or even phrasal group create any clear pattern within the lines. The visual line ends do, however, force a rhythm different, for example, from that of the original, and the line itself becomes the dominant metric control.

Lines are, then, usually dependent on their interior components, and their total durations are the result of these units. When some interior units approach isochronism, then lines of the same number of units will also approach equal durations, and may be "squared off" by pause to keep the beat. When interior units vary in number and in duration, then lines of graded sizes are the probable result.

It is possible, however, to use a line of refrain as a stable duration unit against which other graded lines make a pattern. Dylan Thomas' "And Death Shall Have No Dominion" is an example where isochronous lines "firm up" and hold the graded lines which lie between them. The first and last lines of each stanza repeat the words of the title and the interior lines vary in the number of syllables and stresses.²⁰ Such a refrain need not be performed using equal time for each repetition, but unless the variations are large, its duration will be perceived as the same, whereas the lines which lie in between are not given indicators which clearly bring them into any more than a graded relationship.

The application of the system of metric patterns to the Eliot and the Campion has exhausted its metric possibilities so that the next domain of sound pattern is in rhythm and its units, and the next section touches on those units and on the force they exert on metric.

Part III

A Note on Rhythm and Meter

Rhythm has here been defined as the inherent quality of the sequential fall of the pre-prosodic stress grades and durations. In metrics, the sequence is measured into various units dependent on patterns of stress or count of syllables or both. Phrasal units may or may not coincide with these units. However, the sequential rhythms can also be divided into phrasal units, the segments formed by terminal junctures. These juncture groups can occasionally function as metric units if sufficient parallelism, pause, or adjustments in syntactical order mark them. Each such juncture group can be described as a distinctive unit in terms of the number of syllables and patterns of stress grades within it.

There is some syntactical parallelism in both the Campion and the Eliot, not sufficient to make the juncture groups metric units, but sufficient to strongly support the groups as marked on the Basic Chart on Row S-4N. The rhythm units can be indicated in detail by stress grades and the highest stress, or by a binary shorthand of the

both the Campion and Eliot selections. They are *../. and .../* , but the stress grades reveal differentiating particulars. For the *.../* group, the Eliot is 3024, the Campion 0305, and the internal rhythms are dissimilar. For *../. ,* the Eliot is 4050, the Campion 2050, and the internal rhythms are similar.

Whitman makes metric use of the juncture group marked by parallelism, lines, punctuation. I find one of his much used devices to be a major juncture group marked by line or punctuation and divisible by potential juncture into two smaller juncture groups, the first with fore-stress and the second with end-stress, so that the two together form marked units with the basic pattern of */.. .. /* sometimes with an occasional light syllable fore or aft so that the basic pattern can also be *./.. ./*. Some lines from "When Lilacs in the Dooryard Bloomed" give an example:

Solitary the thrush,	<i>/... ./</i>
The hermit withdrawn to himself, avoiding the settlements,	<i>./.. .. / ./.. ./..</i>
Sings by himself a song.	<i>/.. ./</i>
Song of the bleeding throat,	<i>/.... /</i>
Death's outlet song of life, (for well dear brother I know,	<i>/... ./ ./... ./</i>
If thou wast not granted to sing thou would'st surely die.)	<i>./.... ./ / /</i>
	(11. 20-25) ²²

Although the use of juncture groups as a metric unit is not usual, the groups are, of course, present everywhere and their patterns are a

part of style. Whitman's palette of groups differs considerably from Eliot's and Campion's, and the shorthand notation is a convenient way of showing the primary stress and syllable constitution of phrasal groups for comparisons.

The sequential pre-prosodic rhythm of any selection, although it occasionally may be strong enough to create metric out of juncture units, seldom is strong enough to overwhelm stress-metric patterns. Rhythm does, however, exert some force against a metric, and there is a "tension." When metric units are short and metric patterns clear, as in a kind of iambics where stress grades alternate between low and high, then rhythm works within the metric units and is contributing to them. When metric units are short but the sequence raises questions about placement of ictus, then rhythm is pulling more strongly. When metric units are longer, as in strong-stress lines, and questions arise about which of the various stresses are the strong stresses, then rhythm threatens metric units. In both the Eliot and the Campion, duration adjustments were needed to hold the identity of the metric units against the force of rhythm potential. In both selections the pull of rhythm against the metric pattern with short units can create a second metric with longer units. If the small units are not held by duration adjustments, larger units emerge, and if even these are not steadied by duration changes, then rhythm wins and metric potential has not been realized in performance.

The Eliot and the Campion both have been found to have two possible metrics, one with short and one with longer units, and the

emergence of the larger unit is a result of the pull between the natural pre-prosodic condition of language and the prosodic patterns which can be found in it and actualized. It has been shown that the *Campion* can be read as an alternating pattern 01-2345 with two-syllable units and also as 0123-45 with large units and two major stresses to a line. The *Eliot* can be read as fairly short strong-stressed units by the 012-345 pattern in adjusted stress grades and also as larger units in which the primary stress of each juncture group marks a fore-stressed unit. The patterns glint through each other but cannot both be completely realized simultaneously because, if durations are arranged to hold the sense of one metric unit, the other can be submerged. Yet the alternates do shine through. When *Campion* is read by the more gracious long units, the alternations still are heard, and the strength of the primaries and their fall are still present in the *Eliot* when it is read by the strong-stress trochonic units. But the subsidiary pattern shines as rhythm, not metric, unless the reader slips back and forth in response to their force. Both metrics are imbedded in the words of the selection. Which one is most strongly actualized in performance is perhaps partly dictated by the prevailing climate concerning the virtues of regularity as opposed to variety. The fashion changes, and the performer is influenced by his own century as well as what is known of the prevailing mode of the poet's work and time. The historical approach, in general, pulls the reading toward regularity and the shorter metric unit, because the poets were themselves

generally working with regularity and the short unit in mind. The reading which employs the longer unit is swayed more by the sense rhythms and is closer to them, yet realizes a metrical pulse discoverable in the words.

It is possible to have verse at once so delicate and so sturdy that the reading hardly matters and at every moment some metric unit is being actualized because one is available by almost any stress division. That such verse exists sounds unbelievable, but when Northrop Frye says that in Hamlet's lines "the old four stress line stands out in clear relief against the metrical background,"²³ he is hearing two among metric patterns created by the six possible divisions of stress grades. In this selection all the possible metric divisions of stress grades coincide with the inherent potential of the lines and all provide realizable units and creditable readings with little duration adjustment. Moreover, even the sense primaries create metric units.

A quick Basic Chart of the lines

To be, or not to be: that is the question.

Whether 'tis nobler in the mind to suffer

The slings and arrows of outrageous fortune,

Or take up arms against a sea of trouble . . .

shows that the stresses Frye marks are those identical with the primaries on Row S-4D. A quick Metric Score shows the metrical patterns which coincide with the pre-prosodic stress grades.

1 3 1 4 1 2 3 1 0 4 0

S-4N

S-4D

S-3

S-2

S-1 tū'bi' ɔ'rna'tū'bi' dæ'tizðəkwestʃən

3 0 1 5 0 1 0 3 1 5 0

S-4N

S-4D

S-3

S-2

S-1 weðartiznōūblərɪndæmāɪndtu sʌ'fər

0 2 0 5 1 2 1 4 0 5 0

S-4N

S-4D

S-3

S-2

S-1 dæslɪnzændæ'rouzʌ'vōut'reɪdʒəs'fɔ'rtʃun

1 3 1 4 0 2 0 3 1 5 0

S-4N

S-4D

S-3

S-2

S-1 ɔ'rteɪkʌ'pə'ɪmzə'ʒenstəsi'ʌ'vɪrʌ'bəlz

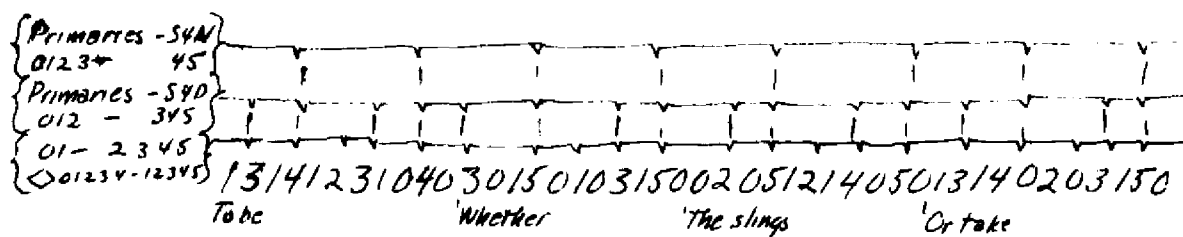
SHAKESPEARE
QUICK BASIC CHART

Primary 5-4W
 Primary 5-4D
 0123-4S
 012-34S
 01-234S
 01234-1234S To be or not to be That is the question
 1 1 4 1 2 3 1 0 4 0
 LINC

Or take up arms against a sea of troubles
 1 3 1 4 0 2 0 3 1 5 0
 The slings and arrows of outrageous fortune
 0 2 0 5 1 2 1 4 0 5 0
 Whether his nobler in the world to suffer
 3 0 1 5 0 1 0 3 1 5 0
 That is the question
 1 1 4 1 2 3 1 0 4 0

SHAKESPEARE
QUICK METRIC SCORE

The Basic Chart shows that Frye is hearing metric and at the same time the sense stresses of a deliberately paced reading. The Shakespeare Metric Score shows that the lines have a design of stress potential such that three metric patterns among them coincide with the common metric of English and sense rhythm at either deliberate or normal tempo, and all are spaced so that units by any reading would be metric. That is, both "greater than" metric and the division 01-2345 gives the same stress placement. Even the substituted trochees keep within the division and there is only one low stress on "in." The stresses of the 012-345 division are the same as the primaries of Row S-4D which Frye hears with the exception of "stings." The two primary stresses on Row S-4N to each line of verse are the same as those of a 0123-45 division with an extra on the "rage" of "outrageous." The only difficulty lies in describing the interlocking patterns in such a way that their design is made clear. Certainly, the Metric Scores of the Eliot and the Campion show no such versatile potential. Perhaps a summary diagram of the divisions and units in the Shakespeare can adequately display the stress structure.



The question might well be asked, which reading of the Shakespeare should be the dominant, the preferred, solution? The answer is that

even if the lines are read as "prose," as long as the inherent pre-prosodic stress grades are actualized, prosodic patterns of several varieties will be actualized at the same time without further effort. The lines are such that metric patterns cannot be kept out of them by a "sense" reading. A performer can choose to accentuate any of the metric units, five to a line, four to a line, or two to a line, by the tiniest of duration adjustments or by the slightest exaggeration of all members of one stress grade, but the choice is again between the preference for strong regularity or for more subtle pulse closer to sense rhythms. Truly, however, he need do no more than read intelligently by sense groups to convey the richness of the rhythm and the metrics.

The framework of the Metric Score and the system of metric analysis which it implements have provided metrics for the Campion and Eliot; the stress-grades have demonstrated capability for disclosing the force and movement of both rhythm and meter; and the prosodic step, the second step of the system, has been taken. Only the performance details remain to be considered.

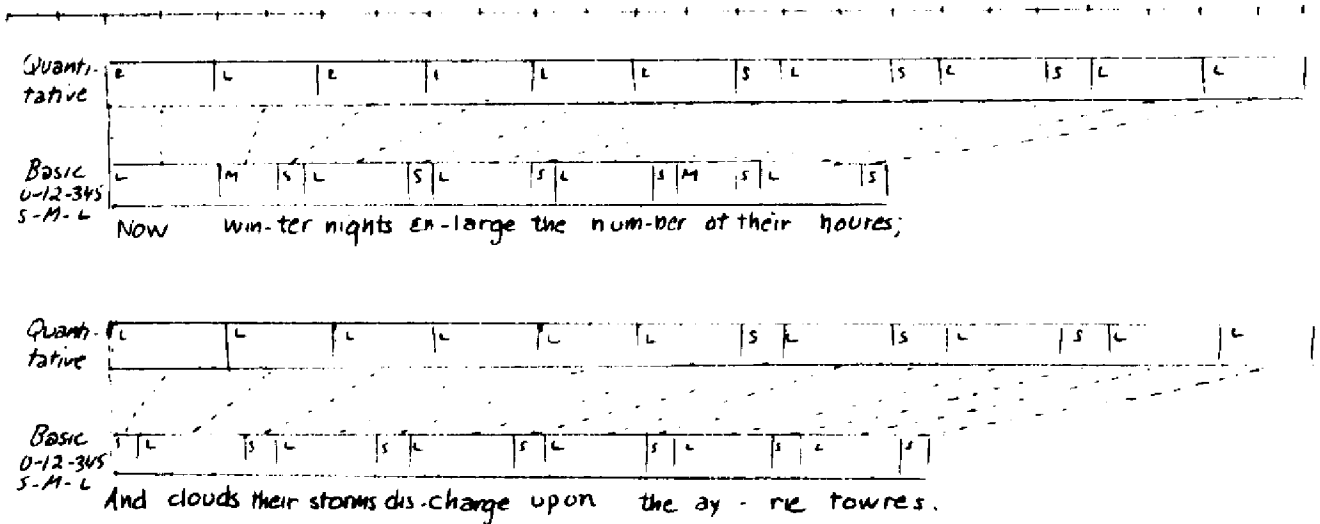
Chapter V Footnotes

¹see fn. 30, Chapter I.

²Henry David Thoreau, The Variorum Walden, ed. Walter Harding (New York, 1962), p. 250.

³Campion was one among the Elizabethans who defended and attempted to adapt classic quantitative theory to English verse. He presented his argument and samples in Observations in the Art of English Poesie (1602). In it he accepts the rule of length by position. A basic DPL strip and its projection into a strip made according to classic quantities show the resulting distortion and the many long syllables in "Now Winter Nights."

isochronous unit, short syllable



Although the extension and the series of even syllables is non-English and a reading by it would be odd, the strip does suggest that Campion was listening for subtle durations and heard something of stress, for although some unstressed syllables are stretched, no stressed syllable is compressed.

For Elizabethan critical writings on quantity, see G. Gregory Smith, ed., *Elizabethan Critical Essays*, 2 vols. (London, 1904). Sir Philip Sidney's rules and Ringer's comments on his attempts are in The Poems of Sir Philip Sidney (London, 1962), pp. 389-395. G. L. Hendrickson argues effectively that Elizabethan experimenters wrote some verse quantitatively but pronounced it with natural accents, "Elizabethan Quantitative Hexameters," Philological Quarterly XXVIII (1949), 237-260. G. D. Willcock "Passing Pitefull Hexameters: A Study of Quantity and Accent in English Renaissance Verse," Modern Language Review, XXIX (1934), 1-19.

⁴Sidney Lanier's musical prosody, The Science of English Verse (Boston, 1880), is based on syllables in strict ratios within isochronous feet, but his syllabic durations are controlled by stress, not quantity.

⁵That musical prosody such as Lanier's is not founded in fact is shown by the early measurements of Warner Brown, Time in English Verse Rhythm (New York, 1908); E. A. Sonnenschein, What is Rhythm? (Oxford, 1925); and Ada Snell (see fn. 52 in Chapter II); and is seen in spectrograph evidence, as, for example, in Seymour Chatman, A Theory of Meter (The Hague, 1965), pp. 161-181.

⁶Wimsatt and Beardsley think there can be an approximation to isochronism in some nursery rhymes and ballads, "The Concept of Meter: An Exercise in Abstraction," PMLA, LXXIV (1959), p. 589, and I think it possible that the syllables within such verse might approach ratios in a few cases.

⁷Even Daniel Jones, for example, uses music notation without bars to convey "approximate" rhythms of English phrases. An Outline of English Phonetics, 8th ed. (New York, 1956), pp. 237-244. Northrop Frye uses it with bars to demonstrate the four-stress line he finds "inherent in the structure of the English language," Anatomy of Criticism (Princeton, 1957), pp. 251-255.

⁸Harvey Gross, Sound and Form in Modern Poetry: A Study of Prosody from Thomas Hardy to Robert Lowell (Ann Arbor, 1964), p. 16.

⁹John Crowe Ransom is aware of four stresses in language of strong, weak, less strong, less weak, but uses two for metrics, "The Strange Music of English Verse," The Kenyon Review, XVIII (1956), p. 465. On the distinction between the concept of rhythm and meter, see Benjamin Hrushovski, "On Free Rhythms in Modern Poetry," Style in Language, ed. Thomas A. Sebeok (New York, 1960), pp. 173-190.

¹⁰Throughout this study isochronism is held to be only approximate and to depend upon the consciousness of the concept in the performer or the listener. Verse can be read to convey a sense of isochronism or not. Chatman, summarizing discussion on the disparity between physical fact and perception says, "we conceptualize metrical time in terms of rough equalities" A Theory of Meter, p. 115. The isochronism used in experiments with the DPL strips represents occasions when metrical units are "conceptualized" as if equal.

¹¹Alexander Pope, "An Essay on Criticism," The Poems of Alexander Pope: Pastoral Poetry and an Essay on Criticism, ed. John Butt (London, 1961), pp. 282, 283.

¹²Cf. Samuel R. Levin, "Internal and External Deviation in Poetry," Word, XXI (1965), 225-237.

¹³Gross rejects what he calls a rationalized trochaic scanning:

Apríl | is the | cruellést | month, | breeding |
 Lilács | out of the | dead land, | mixing |
 Memory | and desire, | stirring |
 Dull | roots with | spring rain. |

but gives for a strong-stress:

Apríl is the cruellést month, breeding
 Lilács out of the dead land, mixing
 Memory and desire, stirring
 Dull roots with spring rain.

Both markings, however, indicate what are here termed rhythms, not meters. Sound and Form in Modern Poetry, p. 38.

¹⁴Since strong-stress "feet" range in size from one syllable to five or six and there are no terms either to distinguish fore- or end-stressed units or to give the syllabic size of the units, a system of a few terms is here suggested which might fill the gap, although only the proposed generic adjectives are used in this study.

trochonic meter fore-stressed			iambadic meter end-stressed
one	syl.	a troch	an íam
two	"	a trochee	an íamb
three	"	a dactyl	an anapest
four or more		a trochon	an íambad

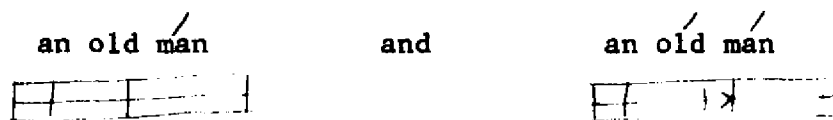
Gerard Manley Hopkin's strung rhythm would thus be an isochronous trochonic meter, according to his definition in the Author's Preface to *Poems*, ed. W. H. Gardner, 3rd ed. (London, 1948), p. 9.

¹⁵I agree with Catherine Ing that Campion's extensive use of sound repetition and echo indicates "a desire on the part of the poet to emphasize the larger units of his form rather than the small elements which are grouped to make those units." She points out that in "Now Winter Nights," "The first line of each stanza must run without a pause into the second, and the third into the fourth, unless reason is to be denied. The decided rimes, however, cannot be denied. There is obviously some structural intent in the division of lines."

Elizabethan Lyrics (London, 1951), pp. 166, 160.

¹⁶See the discussion on primary stress and fn. 36-41 in Chapter III. The importance to the prosodist of the Trager-Smith structural approach is that the concept of one and only one primary stress between terminal junctures supplies him with a way of finding at least these points of potential stress force on the printed page. However, Morris Halle and Samuel J. Keyser argue against the existence of the single primary stress in "Chaucer and the Study of Prosody," College English XXVIII (1966), 187-219. In noun phrases or in noun phrases composed of an adjective and a noun contemporary British English has two level stress, whereas American English generally subordinates the stress of the adjective, but this fact does not disprove the existence of the primary stress. I am suspicious of the term "level stress" particularly since

there is much phonetic evidence which suggests that two similar stresses in succession are avoided. It is possible that the difference between an old man and an old man is a matter of duration. That is:



¹⁷See fn. 41 in Chapter III; Wilbur Schramm, Approaches to a Science of English Verse (Iowa City, 1935).

¹⁸pp. 30, 31.

¹⁹Wimsatt and Beardsley, arguing against timers, point out that if isochronism from primary stress to primary stress "were a general principle, or even an approximate principle, of all English speech, it would clearly be a different thing from meter. It would not serve to distinguish the metrical from the non-metrical." "The Concept of Meter: An Exercise in Abstraction," 587. Some "configurational heightening of the stresses" is needed, they feel, to mark strong stresses.

²⁰The first of the three stanzas is:

And death shall have no dominion.
 Dead men naked they shall be one
 With the man in the wind and the west moon;
 When their bones are picked clean and the clean bones gone,
 They shall have stars at elbow and foot;
 Though they go mad they shall be sane,
 Though they sink through the sea they shall rise again;
 Though lovers be lost love shall not;
 And death shall have no dominion.

Dylan Thomas, The Collected Poems of Dylan Thomas, Augmented Edition (New York, 1957), p. 77.

²¹In the Trager-Smith system no more than four phonemic degrees of stress are possible between terminal junctures, George L. Trager and Henry L. Smith, Jr., An Outline of English Structure, Studies in Linguistic Occasional Papers No. 3, (Norman, Okla., 1951), 7th repr. (Washington, 1966), pp. 49, 50. According to the pre-prosodic analysis here no more than four grades of stress appear in a juncture group. Four degrees would be sufficient to show the stress relationships within a juncture group but are not sufficient to clarify the stress relationships between juncture groups. With six phonetic grades of stress, however, the differences between groups can be shown. For example, in the two Eliot groups, "mixing Memory" and "and desire," the Trager-Smith markings obscure the difference in weight between the two primaries; the six grades reveal it. The Trager-Smith degrees are // primary, / secondary, \ tertiary, / weak.

	↓		↓
	mixing	Memory	and desire
six grades	3	0	3 ⁺⁺ 0 1
Trager-Smith	^	v	/ v \

See also fn. 43, Chapter II.

²²The Collected Writings of Walt Whitman, ed. Grey Wilson Allen and Sculley Bradley (New York, 1965), p. 330.

²³Northrop Frye, Anatomy of Criticism (Princeton, 1957), p. 251.

Chapter VI

Performance and Conclusion

The aim throughout the first two steps, the pre-prosodic and the prosodic, has been to serve the third step, performance, and the aim of all three is to serve literary study by providing refined details for the analysis, reading, and criticism of English poetry.

The details which have been garnered from the pre-prosodic Basic Chart and from the three sections of the prosodic analysis, the musical, pre-metric, and metric, are brought together as far as possible in the Performance Strip, a DPL guide to a particular reading, insofar as the structure of the sound can be a basis for a reading.

This study has been addressed to the sound of verse. Although other studies from other viewpoints may suggest some refinements, the first two steps of the analysis here provide a basis for further work. Analysis of strings of semantic echoes and their interconnections with rhyme, for example, might suggest adjustments in pre-metric weighting.¹ Historical consideration of the poet's place in tradition might bring sufficient evidence to weigh the scale for one among several possible metric patterns. But since the preparatory steps of the system have demonstrated consistent support for critical conclusions rather than opposition to them, the first two steps are offered as a foundation upon which other kinds of studies of a poem can build.

The first gives a detached, the second an irritable overtone. Decisions about such details intrude a personal element into the prosodic domain.

The collected potential which the system supplies for a selection is contained in the Metric Score and includes the adjusted stress grades, the grades of pause, the basic duration grades, and the metric patterns checked as suitable by projection in DPL of their durations. It includes, also, the phoneme keys, the vowel tune, and the DPL insignia for terminal junctures. DPL strips have been made, in addition, for the exploration of metric patterns and thus far contain the duration details necessary as a guide to reading, but they also need an indication of the action of pitch and loudness. Since, however, loudness is felt to be generally the least critical of cues to stress, it is possible to represent it in a mechanical way by assigning some force to every syllable according to its grade of stress potential. This permitting loudness to follow stress grades does not, however, merely equate loudness and stress. The actualized stress grade of any syllable, the realization of its dynamic charge, involves not only loudness, but the duration already included in the DPL and also the pitch movements, still to be determined.

The component which is least well provided for is pitch, for which only the vowel tune and a few terminal junctures have been found. The inherent relative pitches of the vowels can be affected by movement of pitch for syllabic stress, and also by the movement of

intonation. That is, a low vowel may be forced up by stress emphasis of the metric, or if the whole phrase is rising, the vowel pitch may be forced higher still. The gradient movement of pitch in the intonation contours, although it has been much studied, has not been fully systematized in prosodic or in phonemic studies.³ It is generally agreed that intonation contours which depart from some norm, whatever that norm may be, superimpose the attitude of the speaker onto his utterance, as do other gross variations in loudness or duration. For loudness and duration, however, the system used here has provided a proposed norm in the inherent potential so that a movement into para-language can be specified, but since the norm for intonation is not certainly known and cannot be predicted in detail from the printed word, all proposals for intonation automatically introduce the probability of attitudinal variations.

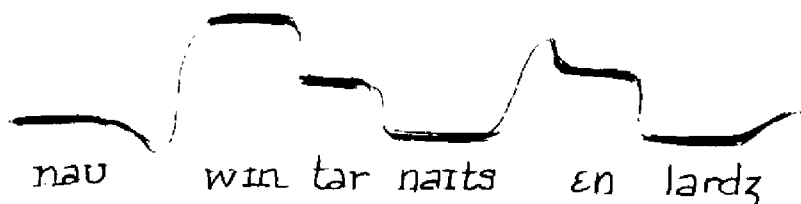
There is some guidance, however, available for help in proposing possible pitch movements which can indicate a proposed intonation contour, show stress characteristics, and contain inherent vowel pitches in one DPL guide strip. As mentioned in Chapter I⁴ there is general agreement that pitch turns or has some prominent movement at the main stress of a group. Bolinger proposes that the pitch behavior at such a point is the main signal of that stress.⁵ Furthermore, pitch is known to generally rise at stresses but can also fall, and Bolinger shows that its movement is such that pitch obtrudes at stress.⁶ In addition, every speaker has a set of relative vowel pitches which, if he spoke with as little stress and expressiveness as possible, would

be present in their basic relations and show movement of fundamental pitch and resonances from vowel to vowel in the form of some tonality tune.

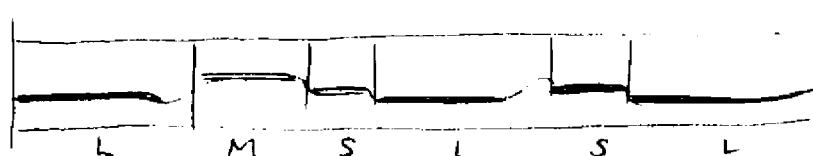
The way in which a proposed Performance Strip in DPL can be built upon these three characteristics of pitch behavior in speech is demonstrated with Campion's line:

Now winter nights enlarge

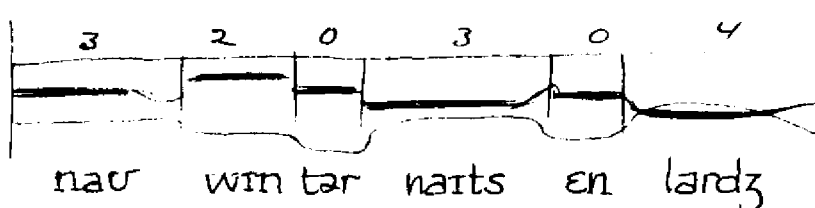
The tonality tune proposed for the line is:



When it is put into a DPL strip with the vertical range of pitches reduced and with the basic pre-prosodic durations, the line becomes:



To this a small rise of loudness can be added in accordance with stress grades and the line is:



Stresses are indicated by the duration and loudness which are keyed to them so that every grade of stress is represented in two parameters.

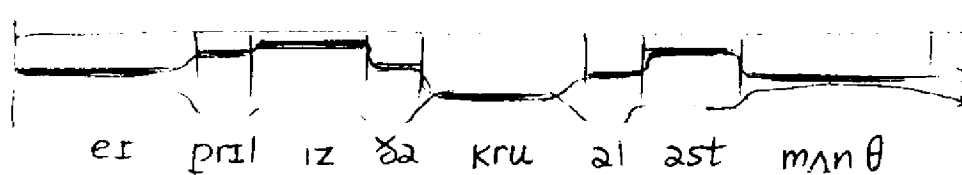
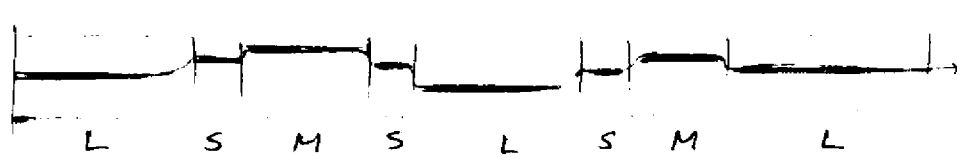
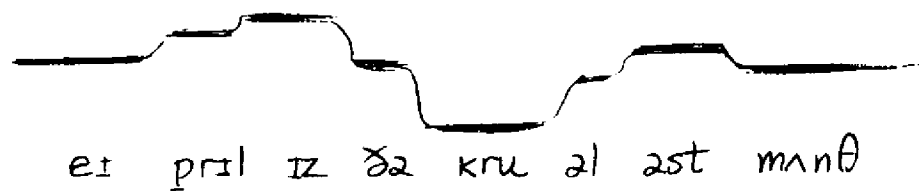
Pitch movement which obtrudes upward at "win-" and down at "large" gives movement in all three parameters to these syllables, but the strip has not yet been given an overall intonation tune, and the pitches are only those within the vowels. However, through exaggeration of the direction of the movements in the tune by a raising and lowering of the syllabic sections, the strip takes on a curve of intonation which does not offend English and which, moreover, turns at the main stresses of the phrase.



The curve can be smoothed out.



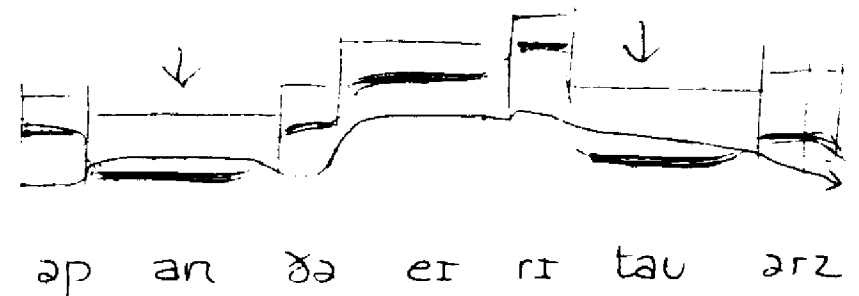
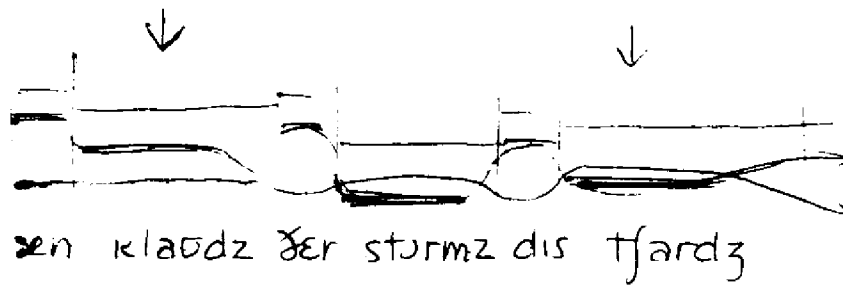
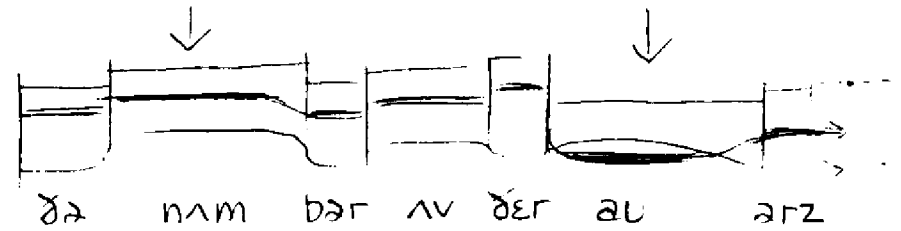
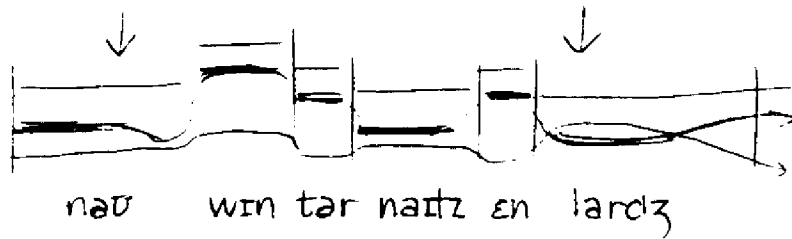
If the same process is carried out on the Eliot, the strip which results also shows intonation which does not offend the English ear and which provides for the main stresses. The "A" of "April" stands out as a beginning, the "is" obtrudes upward, the "cru-" downward, and the "month" is extended by its position before major juncture.



From such pitch building, it is possible to find an inherent contour which does not contradict potential and against which experiments can be made. However, all pitch experiments in DPL are only experiments.

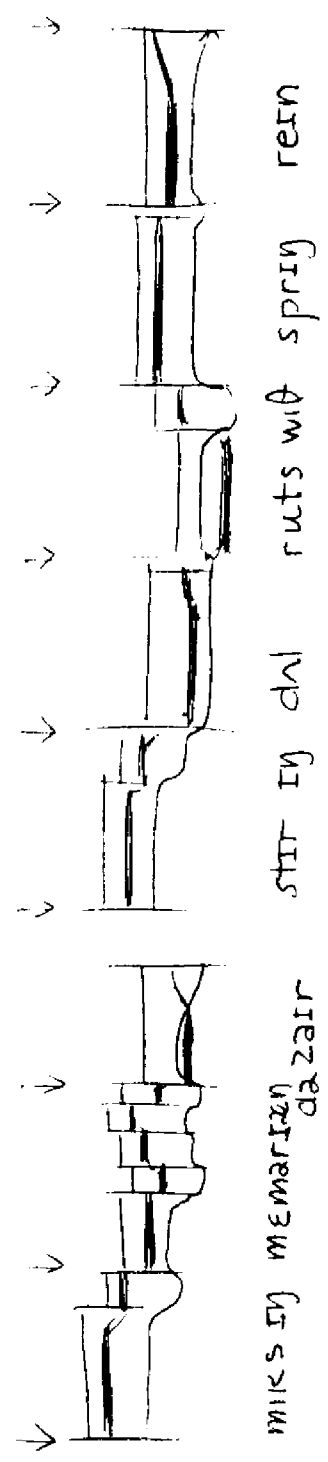
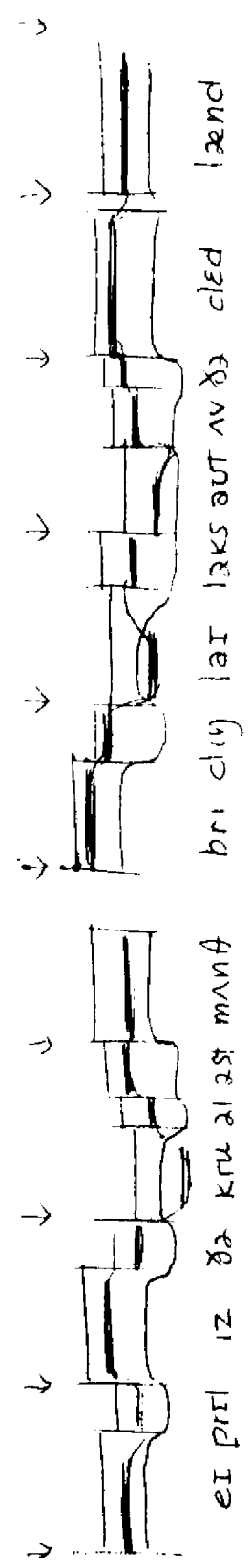
The strip, which is the result of combining tonality tune, pre-prosodic durations, and loudness according to stress, is now ready for final adjustment of durations according to those of the selected metric. When these have been added, the cumulative results of the analysis are incorporated in the strip, and a reading from it can be made. On the next pages proposed strips are given for the Eliot and the Champion. No expressive gradients such as general crescendo or ritardando have been added. The Champion strip is based on the 0123-45 metric to allow room for diphthongal and vowel movement, and the Eliot on strong-stress 012-345 metric to demonstrate a metric in which controlling stresses are more closely spaced. Both approach isochronism to maintain the units of measure.

Metric 0123-45
 Basic graded syllables
 Isochronous iambic units



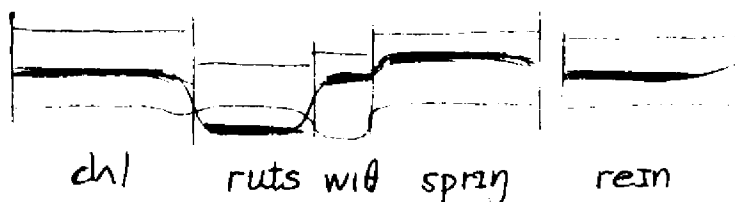
CAMPION
 PERFORMANCE
 STRIP

Metric 012-345
Isochronous trochaic units
Basic graded syllables

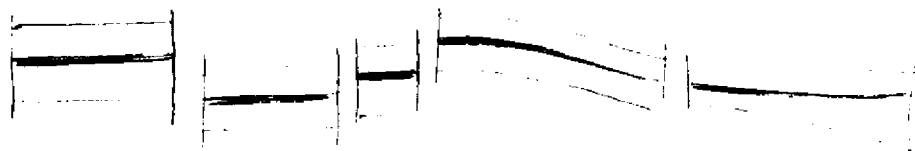


ELIOT
PERFORMANCE
STRIP

Expressive gradients can be added to any Performance Strip at will since they are a part of personal taste, and the same marks which are used for music can be employed here, for indeed, the finished strip gives the "music" of the line. On the other hand, the expression can be written into the strip. For example, ritardando and decrecendo can be built into the last phrase of the Eliot by lowering the syllabic sections, by extending the durations slightly beyond those the metric calls for, and by introducing some pause between the words. The Performance Strip of "dull roots with spring rain" without expressive gradients is:



With decrecendo, discreteness, pause built in could be:



For those who do not care to sketch out details of pitch in DPL, a reading directly from the Metric Score or Metric Strip is possible in which pitch is allowed, as is usual for ordinary speech, to reflect attitude without the intervention of conscious analysis, but such a reading stops short of the full benefit of the system.

The strips provided here for performance are proposals only and other disciplines may bring improved details to them, but the aim has been to provide assistance to criticism, not final solution, and to extend and refine the definition of metric and provide details which supplement criticism, not dictate to it. The next section sums up some of the ways in which the system supports the intuitions of traditional criticism and adds details of prosodic analysis which may be useful to the critic.

Part II

Functions of the System

The three-step system carries prosody beyond traditional limitations. Where conventional prosody has had only the printed lines of verse as a frame for analysis, the pre-prosodic Basic Chart supplies an exploded line stretched to make visible the structural framework of the line with its connections, separations, hierarchy of units, with its blank alleys of silence, its vertical alliterative shafts, its heaping of stress forces into grades of potential stress. Where conventional prosody has had only figures of repetition to mention or discuss, the pre-metric chart provides a way of weighting stress with the cumulative concentrations of repeated sounds, and where terms such as "vowel music" and "orchestration" have had to serve, the phoneme keys and tonality tunes make the terms visible in detail fit for comparative analyses of style. Where conventional prosody has had

an economical but diffuse explanation of metrics and ictus, the Metric Score and the stress grades make visible the refinements possible in metric definition in terms of those stress grades and display the places of ictus in the stress graph in terms of each metric definition. The main advantage of the system, therefore, is that on the basis of an analysis of the inherent potential of any selection it provides the metric patterns of those selections and it gives measured details which assist the description and comparison of the metrics, the rhythms, and the musicality of those selections.

The advantages for metrics of the system are several. The first advantage is that a methodical examination of any selection in terms of each metric on the Stress Score in turn supplies the metrics which are possible solutions for any selection, just as such exploration has shown the metrics possible for the *Campion* and Eliot potential. Traditional inspection of the *Campion* would term it iambic. The system has upheld this metric and also demonstrated that the *Campion* contains larger iambadic units as well. Traditional inspection of the Eliot would generally avoid the problem of his metrics and merely mention his sense rhythms. The system has upheld this "feeling" and demonstrated that trochonic metric, either strong-stress 012-345 or a metric with larger units based on 4N primaries, coincides with inherent potential.

The second advantage for metrics is that the system brings the assistance of the pause score to the determination of whether the metric units of a selection are iambadic or trochonic. Traditional

metric analysis has not provided many ways to demonstrate much concerning the reasons behind the prosodist's strong convictions on whether a selection is fore- or end-stressed. He knows, and he is correct. The student often does not, and is often wrong, but the prosodist can only suggest he find the most pervasive feet, read aloud, find the "beat," get the "feel" of the sense, remember the tradition of the period, or, perhaps, look at the poet's other work.⁷ But the quality of end- or fore-stress strongly felt by the sensitive reader is shown in the system in three sections of the analysis. In the chart of sound repetition weighting, the Campion echoes visibly heap up on end syllables, the Eliot echoes do not. In the stress potential tabulation and the Basic Chart the stress force visibly heaps at certain points in relation to line units. But, most important, the separations and joinings of the units in the Basic Chart and the pause grades which show their cumulative result are instructive in showing the internal nature of units and in revealing whether end- or fore-stressing causes fracture or join within units.

The third advantage for metrics is that the system makes visible the pull between phrase and metric and between phrase and line end, and it weighs both pulls. Traditional metrics does not describe the first and only offers the either-or explanation of enjambment. The system shows the pull between phrase and metric in the stress graph of the Metric Score on which the level is visible at which stress grades of a selection form and hold a short unit

pattern out of and against the sequential fall of the prose rhythms. For example, in the *Campion Metric Score* the first and third rows show an alternating pattern of stresses, whereas the second and fourth do not, and in the *Eliot Metric Score* the patterned units do not appear until the fourth row, 012-345. The system makes visible in the *Basic Chart* the structural pull of line end against or with phrase end. In the pause grades of the *Metric Score* the system weighs that pull and provides a three-way distinction for the conflict. Lines can be end-stopped, enjambment can occur, or forces can be such that enjambment with a very slight internal break or sustentation at line end can be realized, as it is, for example, after the *Eliot participles*.

The fourth advantage for metrics is that the system provides particulars which make it possible to describe distinctions among lines which all fit under one traditional definition. For example, under traditional metric analysis, the following lines are all iambic:

Now winter nights enlarge / The number of their houres;

To be, or not to be: that is the question,

When Ajax strives, some Rock's vast weight to throw,

Conventional inspection of the rhythmic differences among the lines might suggest that the *Campion* has a dull regularity, the *Shakespeare* has a striking combination of sense rhythm and regular metric, and the *Pope* has a slow heavy rhythm. The system shows that, although the

three lines are a form of the general "greater than" pattern in alternating end-stressed pairs, the sub-class metrics differ. Each line has different limitations of palette and ictus and these varying palettes of pairs give precise definition for part of the difference in rhythmic constitution of the lines. The sequential rhythms of the three lines differ in quality. In terms of stress grades they are:

Campion:	32	03	04	05	02	05	0
Shakespeare:	14	14	12	31	04	0	
Pope:	15	24	23	24	04		

The Campion, except for the first pair, shows a greater and more regular contrast between the grades of no and yes stress than the other lines do. The Campion palette of pairs is limited and uses only zero grade for no-stress:

02	exceptions
03	32
04	final 0
05	

The Shakespeare has more weight than the Campion in the no-stress and less weight on the ictus, but both lines have a feminine ending. The contrast is restrained, less obviously alternating, and the palette is:

04	exceptions
12	31
14	final 0

The Pope has heavier grades throughout than the others. The palette is varied and has no exceptions.

04
15
23
24

If all four lines of the Pope selection analyzed in Chapter V are examined, they show that he has used a greater range of variety in pairs than appear in the Campion and Shakespeare four-line selections. Moreover, comparison of Pope's palette of pairs for slow lines and for quick lines shows how he has used contrasting sets of pairs to achieve the effect he tells us he intends.

Palette for Heavy Lines	Palette for Light Lines	Exceptions
03 24	01 23	1-1
04 25	02 24	(4-5)
15 34	03	
45	04	

The palettes show that the tempo of Pope's lines is built on rhythmic forces, not on subjective forces in the reader's mind. The palettes show, too, the difference of range from the Campion and Shakespeare. Pope uses thirteen different pairs in all; Shakespeare uses eight with three exceptions:

02 12	exceptions
13 13	31
04 14	30
05 15	final 0

The comparison of palettes show Pope's wide reach for rhythmic variety, Shakespeare's ordered variety. Campion's four lines do not extend the palette of his first two. The palette for the selection remains the same:

02	exception
03	32
04	final 0
05	

The six grades of stress give details for the analysis and comparison of the various rhythms within the iambic lines.

The final advantage for metrics is that the system provides a pre-metric way of estimating the weight of sound repetition prominence upon stress grades so that the influence of sound repetition can be described and used in metric analysis. The slight adjustment which may occur in a few grades may also clarify a metric pattern.

The system proposed here, however, is not aimed exclusively at metric solutions, but is also directed at uncovering and describing sound repetitions, not only those which create metric pulse, but those which create sound patterns with musical and unifying functions. These sound repetitions are part of the total design and the way in which they are distributed forms patterns and creates tone colors which are interesting in themselves and which are a part of style. The pre-metric position chart with its note of all positioned repetitions brings to light patterns of repetition and provides another way in which selections can be compared. For example, the Campion sound repetitions cluster at line ends, not only in the obvious rhymes but in the subtle echo strings which connect with the rhymes. The Eliot repetitions are more generally distributed and concealed than those in the Campion. The pre-metric analysis uncovers the repetition and reveals the difference in disposition and quality. The phoneme keys provide quick visual comparison of the tonality of passages.

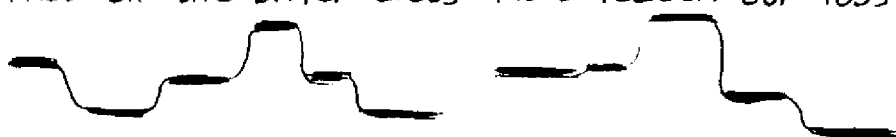
The system provides description of the musical properties of a selection, its sound repetitions, its tonality, its vowel color. This description gives more particular statement based on more thorough

examination than traditional note of these properties. For example, traditional criticism has generally agreed that Campion's verse is "musical" in some way,⁸ but none of the explanations which have been suggested fully explore the pattern of pitch relations in the vowels, although vowel color is often mentioned and critics feel the importance of vowel pitch as an element of style. I. A. Richards is aware of pitch relations and he states that pitch control is part of the poet's technique.⁹ Of Milton's lines from "The Hymn on the Morning of Christ's Nativity,"

That on the bitter cross
Must redeem our loss

he says, "It is as natural to lower the pitch in reading the word 'loss' as it is to emphasize it as compared with 'our' in the same context."¹⁰ But why this may be so he does not venture to say. The scale of pitches used in this system and based on the typical relationships of vowel and diphthong formants do show something of the probable fall of pitch on "loss." It is the same low vowel that punctuated Muir's lines at "horse," "across," "wall," "all." The tonality tune of the Milton is:

That on the bitter cross Must redeem our loss



The tonality tunes are useful for comparisons. For example, if Milton's final words had been "height" and "plight," the resulting tunes would show an absence of elegance apart from semantics. The tunes would veer to the norm, an undistinguished fluctuation.

That on the bitter height Must redeem our plight.



Traditional criticism, although taking note of dominant sounds and of series of sounds in a passage, has generally done so on a fragmentary basis. In this system here, the thorough analysis shown in the phoneme keys supports the critical intuitions, as discussed in Chapter IV, that Campion's lines are full and relaxed, Eliot's tense and toothy,¹¹ and that Campion's are as pleasant and relaxed as the warm indoors, Eliot's as dry and bitter as his arid land.

Some details of sound are often pointed out and related to meaning in criticism. The framework of the Basic Chart makes visible structural qualities which reveal details such as the extent of an alliterative shaft or the discreteness or joined quality of a phrase. Row S-2 of the Pope Basic Chart shows the discreteness of syllables in his heavy lines, the blending in his light lines.

weneidzæ ksstraiuz sɪ mɪrə ksvæ stweɪt tɑθrou

ʃalain tu leɪbɪz ændʒæwɛrdzmu vslou

nɑtsou wɛnswɪftkamiləskaurzʒəpleɪn

flaɪzouərɔnbendɪŋkʊm ændskɪmzəlɪ ɪʒəmeɪn

Because Pope has declared his intent, it is proper to see in the discrete heaving humps, Ajax's motion and muscles, and in the winging joined syllables, Camilla's skimming flight. On this basis it is fair to see how Eliot's syllables blend and hasten to mix "memory and desire" in sound as well as sense, and so perhaps, how the fall of slow drops is echoed in the separation of syllables in "dull roots with spring rain."

The advantage of the system for performance is primarily in the thoroughness of the analysis which precedes that performance and which assists the metric solution. Traditional direction for performance is not explicit beyond a binary marking of stress metrics. The system proposed here provides metric units and grades of dynamic charge for each syllable made visible in DPL strips which can indicate that dynamic charge through duration and pitch and loudness. DPL strip can also incorporate added gradients of expressiveness. A performer can use DPL to indicate detail as far as he cares to implement it within the inherent potential and metric pattern. The system

provides the most probable short metric of any selection and usually, also, a longer unit metric closer to sense reading. It cannot prescribe a choice between two possible metrics beyond the general guide that a short metric unit is sometimes based on a more economical theory that a longer unit and that the simplest pattern in the shortest units is, usually, but not necessarily, preferable to a pattern in long complex units.

The entire system by its stringent separation of sound from meaning helps to define the extent of the interrelationship. The analysis by the pre-metric chart of repetitions delineates the area of prominence which lies in structure and sound from that which lies in meaning and which should be certainly examined in any complete analysis of a selection for which this system is basic but not yet a final answer. For example, if a few changes in the semantic choices of a selection are made with as little change of sound pattern as possible, the area of sound is shown.

April is the coolest month, greeting
 Lilacs out of the fed land, mixing
 Memory and desire, stirring
 Lulled roots with spring rain.

The meaning is certainly different, the shock and contrast have gone, the effect is soft, we, not precisely pleasant, yet the sound repetitions, meter, and rhythm are almost the same. Therefore, semantic weighting is a refinement which is still needed yet can be added to the sound foundation rather than used to build a different edifice.

There is a traditional schism between prosodic analysis and the analysis of prose rhythm, but the system here bridges that separation and provides a way to analyze all shades of prose, verse, prose-poetry, poetic prose, prosy verse in the same terms and on the same framework. The stress grades, the pre-metric weighting, the structure blocks, the rhythms can all be compared visibly and particularly on the Basic Chart, charts of positions, pre-metric weight, and even the Metric Score, where prose which occasionally dips into fleeting metric out of the ordinary phrases and primary stress rhythm can be seen doing so.

Finally, the system provides the scholar who uses it, not only with detailed knowledge of the sound of the selections he charts, but with a permanent sheaf of reference sheets which keep the details ready in a quickly visible form for use in critical discussion and comparison.

Chapter VI Footnotes

¹The separation of sound from meaning in this study is only the first part of full study. Roman Jakobson "Closing Statements" in Style in Language, ed. Thomas A. Sebeok (Cambridge, Mass., 1960), p. 367, states that "attempts to confine such poetic conventions as meter, alliteration, or rhyme to the sound level are speculative reasonings," but I hold it is justifiable to separate the sound for analysis in order to later join it with meanings.

²See fn. 30 in Chapter I.

³Neither Daniel Jones' attempts to sort out normal tunes in An Outline of English Phonetics, 8th ed. (New York, 1956), nor Kenneth L. Pike's study in The Intonation of American English (Ann Arbor, 1945), provides a system suitable for the prosodist. Intonations are not, as John Hollander points out, schematized in English metrics, "Comments to Part Five," Style in Language, p. 203.

⁴See fn. 27 in Chapter I.

⁵Dwight L. Bolinger, "A Theory of Pitch Accent in English," Word, XIV (1958), 109-149. Seymour Chatman incorporates the concept into his A Theory of Meter (The Hague, 1965).

⁶He describes the obtrusion as "pitch prominence," and states in his conclusion that "While the upward obtrusion is basic, pitch prominence need not be merely upward, as commonly supposed, but may take other directions." "A Theory of Pitch Accent in English," 149.

⁷Warner Brown, Time in English Verse Rhythm (New York, 1908) measures the ictus in trochaic verse to be much shorter in comparison to the non-ictus than in iambic verse, as Chatman reports in A Theory of Meter, p. 79, but even if so, the fact provides little assistance to the ordinary reader who is groping for the basic meter. However, if pause potential comes after the non-ictus, it may act to extend it.

⁸For example, Hallett Smith mentions Campion's "seeing the words in terms of a melodic line," and his "scrupulous care and sensitiveness to the movement of the line, the inflectional effects suggested by music," and his "Rose Cheekt Lawra" "evoking and stimulating the melodic, harmonic, and rhythmic resources of music," Elizabethan Poetry (Cambridge, Mass., 1952), pp. 282, 281, 285, and his "Discoverer" Arthur H. Bullen mentions his "exquisite a sense of form," and his "triumphs of metrical skill" Lyrics from the Songbooks of the Elizabethan Age, rev. ed. (London, 1889), p. xviii.

⁹See fn. 13 in Chapter IV.

¹⁰The Principles of Literary Criticism (New York, 1928), p. 141.

¹¹Dell Hymes says that frequency and weighting of sounds are important to the analysis of a poet's style and adds, "perhaps Eliot has a predilection for dental stops..." and counting can determine if it is so. Presumably he has sensed the predominance, but not yet undertaken the count, "Phonological Aspects of Style: Some English Sonnets," Style in Language, p. 129.

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