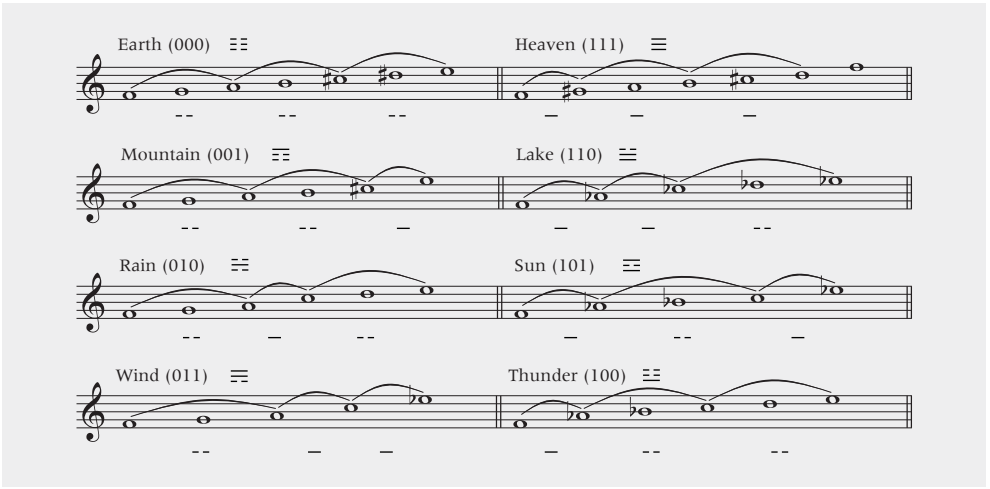
An Unpublished Paper by Chou Wen-chung

by Eric C. Lai

A prolific writer, Chou Wen-chung has on many occasions introduced his compositional system, which focuses on what he calls *variable modes* (or *pien-modes* or *mutable modes*).[1] The construction of the variable modes is based on the metaphysical principles as expounded in *Yijing* (or "Book of Changes"), one of the five Confucian classics. *Example 1* summarizes one realization of the variable modes, which are musical "translations" of the trigrams – tri-linear arrangements of *yin* (expressed as "0") and *yang* (expressed as "1") that form the basis of *Yijing*.[2]



Example 1: The eight variable modes.

The constructs that appear in *Example 1*, which show Chou's first systematic treatment of the variable modes, are used in *Metaphors* (1960).[3] However, the juxtaposition and superimposition of melodic patterns with similar intervallic profile appears as early as *Seven Poems for T'ang Dynasty* (1952).[4] After *Metaphors*, Chou felt the need to develop his modal system in a more formal way; this prompted the completion of an essay in the early

1960s (ca. 1962–63).[5] However, the content of the paper suggests that it was conceived in purely theoretical terms, with no direct reference to music or to the *Yijing*.

A glance through the nine sections of the paper leaves one with the impression of a mini-treatise, whose terminology is at times more technical than revealing *(Example 2)*. Nevertheless, one has to admire the effort Chou put into this paper, whose theoretical rigor paves the way for subsequent practical applications. The paper ends abruptly, implying an unfinished work.[6] While not all of it applies to the discussion at hand, we will examine here those concepts that are relevant to his musical formalization of the variable modes.

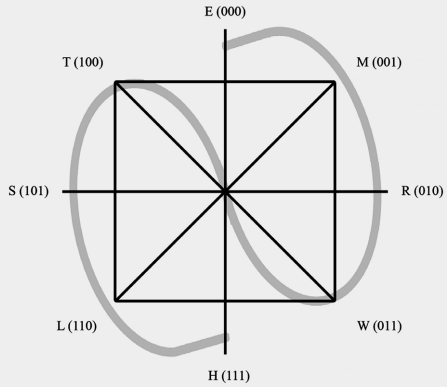
Section	**Concepts introduced**	**Related concepts in later development of variable modes**
The Eight Sequences	Binary nomenclature of the sequences Broken and unbroken interval units	Mathematical identity of variable modes (000, 001, etc.) M2+m2 and m3 intervals representing *yin* and *yang*, respectively
Sequential Relationships	Progression of sequences Relationships between sequences	Modal progression Inversion(R1) and Reflexion (R2)
Tri-Modes	Progressive-regressive pairing	Pairing of modes with opposite contour
Hexa-Modes	Two forms of hexa-modes	
Binary Modes	Vertical combination of Proto-Mode and Invert-Mode	Four-mode structure (modal complex)
Binary-Reflex Modes	Retrograde of binary mode	
Relationship between Binary Modes and Inter-Modes	Vertical alignment of four tri-modes	Simultaneous presentation of four modes
Modal Trans-mutation Order	Special ordering of sequences	Overlapping modal segments to generate continuous structures
Binary Modes in Typical Trans-mutation	Larger structures generated by various techniques	Formal aspects of modal progression

Example 2: Sectional layout of an unpublished paper by Chou (ca. 1962–63).

The paper begins with "The Eight Sequences," which are mathematical equivalents of the eight trigrams expressed in binary arithmetic and are each assigned a symbol (E: 000, M: 001, R: 010, etc.).[7] Here, for the first time, Chou formally introduces the trigram represented as a series of three

numbers chosen from the two digits "0" and "1" and relates them to "interval units" that are broken and unbroken, respectively.[8] Although the interval units were later understood as musical intervals, it would be hard to make those correlations based on the paper alone. In the section "Sequential Relationships," the progression of sequences is discussed and is illustrated by an "S Diagram" *(Example 3a)*.[9] The "S" (actually an inverted "S") refers to the curved route of the arithmetic progression that begins with 000 and terminates at 111. In addition, the concepts of "Reflex-Mode" and "Invert-Mode" as well as various relationships among the sequences (e.g., "segmental mutation," "retrograde inversion," "mutational retrograde inversion," "regression") are introduced.[10] The title of the third section, "Tri-Modes," is misleading, for it refers to two juxtaposed pairs of sequences ("tri-segmental modes") that are related by progression-regression (e.g., EH'–E'H). In this section, Chou uses the " ' " to indicate modes with a descending contour; the symbol has since become a standard in Chou's modal nomenclature.[11] The next section, "Hexa-Modes," consists of only one sentence that introduces the subsequent sections. In the fifth section, contrary to the technique of juxtaposing modes introduced in the third section, Chou superimposes two pairs of sequences to generate a "Binary Mode." The upper pair and the lower pair of the binary mode are referred to as "Proto-Mode" and "Invert-Mode," respectively.[12] The discussion of a four-sequence structure as discussed here, which is illustrated in the paper by a diagram *(Example 3b)*, anticipates the theory of "modal complex" used later in his music.[13]

The second half of the paper further explores and expands on the concepts that have been presented. The "Binary Reflex-Mode" is defined as the retrograde of the Binary Mode. In the seventh section, Chou inserts a binary mode (Inter-Modes) within another binary mode to create a complex structure. Interestingly, the simultaneous appearance of four modes is musically presented in Chou's later works, in particular those whose texture is governed by four instrumental voices, with each assigned to a mode or mode pair (e.g., *Windswept Peaks, Clouds*). In "Modal Transmutation Order," the sequences are overlapped (e.g., 01110 is derived from 011–111–110) to produce longer strings of modal events. The final section, "Binary Modes in Typical Transmutation," combines binary modes, intermodes, and modal transmutation order into larger structures with cyclic operation, resulting in "sixteen transmutation orders by which a mode transmutes through all eight modes before its own re-emergence" (page [11]; *Example 3c*). The principles introduced in this section foreshadow the modal progressions in his later works and consequently affect their formal design.



3a) The "S Diagram"

M 1 0 W'

0 1

0 1

1 0

1 0

L' 0 1 T

3b) A visual representation of "Binary Modes"

S WHL TEM RS
SR TEM WHL S
R TEM WHL SR
RS WHL TEM R
TEM WHL SR T
TEM RS WHL T
WHL TEM RS W
WHL SR TEM W
EM WHL SR TE
EM RS WHL TE
M WHL SR TEM
M RS WHL TEM
HL TEM RS WH
HL SR TEM WH
L TEM RS WHL
L SR TEM WHL

3c) The sixteen transmutation orders

Example 3: Diagrams from Chou's paper.

Although Chou's paper was conceived in purely theoretical terms, it nevertheless was an important exercise for the composer to set up frameworks of reference, clarify some conceptual issues, and provide a scientific basis for the theory before he ventured into musical applications. With another paper of similar scope, Chou introduced musical terminology with the hope of bridging the gap between theory and application.[14] Eventually, he dropped this tedious process of pure formalization and worked with actual musical notation, as shown by the many sketches that have survived from this period. These sketches paved the way for a journey of creative activity, which has resulted in a collection of works that span a period of over four decades and display the evolutionary quality of Chou's compositional system and music.

[1] For example, see Chou Wen-chung, *Pien* (New York: C. F. Peters, 1967), Preface; "Towards a Re-Merger in Music," in *Contemporary Composers on Contemporary Music*, ed. Elliot Schwartz and Barney Childs (New York: Da Capo, 1978), pp. 311–12; and *String Quartet "Clouds"* (New York: C. F. Peters, 1997), notes. For extended analyses and discussions of Chou's variable modes, see Janet Jie-ru Chen and Shyhji Pan-Chew, "An Introduction to Chou Wen-chung's Concept of 'Water-Image' Symmetry," *Mitteilungen der Paul Sacher Stiftung* 19 (April 2006): 40–45; Kenneth Kwan, "Compositional Design in Recent Works by Chou Wen-chung" (Ph.D. diss., State University of New York at Buffalo, 1996), pp. 12–46; and Eric Lai, "The Evolution of Chou Wen-chung's *Variable Modes*," in *Locating East Asia in Western Art Music*, ed. Yayoi U. Everett and Frederick Lau (Middletown, CT: Wesleyan University Press, 2004), pp. 146–67.

[2] In the original text, *yin* and *yang* are symbolized by "– –" and "—", respectively.

[3] These constructs, which I call "Prototypes," represent one of several forms of the variable modes that Chou has developed and employed in his music. For an exposition of the different types of variable modes, see Lai, "The Evolution of Chou Wen-chung's *Variable Modes*" (note 1), pp. 150–56. An analysis of the first movement of *Metaphors* appears in Eric Lai, "Modal Formations and Transformations in the First Movement of Chou Wen-chung's *Metaphors*," *Perspectives of New Music* 35, no. 1 (1997): 153–85.

[4] This statement is verified by one of the sketches for the piece, which consists of labeled melodic patterns and their inversions and retrogrades arranged in the form of a table (sketches for *Seven Poems of T'ang Dynasty*, Chou Wen-chung Collection).

[5] The original paper in typescript (11 pages) is located in the folder "Theoretical basis for the modes," as part of the text collection "Studies in Chou Wen-chung's Personal Musical Theory" in the Chou Wen-chung Collection of the Paul Sacher Foundation. The date of the paper was provided by the composer during a private conversation on December 3, 1994, in New York City.

[6] Another folder ("On modal image") of Chou's text collection contains an additional paper (hereafter "second paper") that relates closely to the paper under discussion here. However, the content of the second paper suggests that it was completed later and therefore can be considered a continuation or a revision of the first paper. Moreover, there are direct references to music, as evidenced by the use of terms such as "hexachordal" and "scale" and the reliance on letter names in the examples. The emphasis on the augmented chord in the paper suggests that it is most likely a theoretical formalization of the class of variable modes that I call Aggregates II (Lai, "The Evolution of Chou Wen-chung's *Variable Modes*" [note 1], pp. 150–56).

[7] Some of the names and/or symbols of the trigrams have changed as Chou's theory has developed. For example, S (Sun) in the paper is equivalent to F (Fire) in the *Metaphors*

sketches. In the sketches for later pieces such as *Cursive* (1963) and *Windswept Peaks* (1990), the modes are mostly shown in lower case letters; capitalized nomenclature would represent larger structures such as modal complexes (see note 13 below).

[8] The "broken" and "unbroken" quality, of course, refers to the visual appearance of the original *yin/yang* symbols.

[9] In order to clarify my discussion of *Example 3*, the diagrams in the original paper are supplemented with additional information, including the numerical identification of the modes (e.g., 001) in *Example 3a* and the modal labels (e.g., M) in *Example 3b*.

[10] The concepts of "Reflex-Mode" and "Invert-Mode" correspond to my and Kwan's definitions of reflexion/inversion and R2/R1, respectively. See Kwan, "Compositional Design in Recent Music" (note 1) pp. 36–42; and Lai, "The Evolution of Chou Wen-chung's *Variable Modes*" (note 1), p. 151.

[11] See Examples 8.1b and 8.1c of ibid., pp. 152–53.

[12] This "Invert-Mode," which is different from the "Invert-Mode" discussed earlier in the paragraph in connection with the second section ("Sequential Relationships"), causes a big confusion for the reader.

[13] The term "modal complex" is borrowed from Kwan, who uses it to refer to groups of modes formed from pitch constructs or from the rhythmic modes as appeared in *Echoes from the Gorge* ("Compositional Design in Recent Works" [note 1], pp. 29–35, 204–15, 282ff., and passim).

[14] See note 6.