musical analyses he offered were meticulous and dry. Miss Bradshaw says, "The explanations are so intricate and detailed; even when challenged he refused to explain them. I believe it was willful secrecy on his part. He showed little interest in the book. He never looked at the copy of the typescript."

Here is Boulez on the second formant, Trope, of his Third Piano Sonata:

The series is divided into four groups, of four, one, four and three notes respectively, which I will call a, b, c, d. Groups a and b/d are joined isomorphically, the original figure a being at the same time inverted and permuted; group c consists of two isomorphic figures. Figure a is reducible to two generative intervals, the semitone and the fourth, which will create the vertical and horizontal relationships (E♭–F♭/B♭–F♯; E♭–B♭/F♭–F♯); the connecting intervals are the augmented fourth and the whole tone (F♯–B♭; F♯–E♭). In the figure b/d obtained by inversion and permutation, the vertical relationships are the augmented fourth and the whole tone (G♯–D♯/C♯–E♭); the horizontal relationships and the connecting intervals being the semitone and the fourth (G♯–C♯/D♯–E♭; D♯–C♯/Eb–G♯). Figure c is composed of two isomorphic elements, minor thirds (G♭–B♭/C♯–A♭) observing globally the transposition of a whole tone (G♭–A♭/B♭–C♯); but if the notes obtained by inversion

\[\text{music notation image}\]

are seen in apposition to those of the original figure the relationship of the semitones and the fourth will again be found (G♭–C♯; B♭–A♭). Finally, the series is composed of two isomorphic figures: a/
bd, and of a group which itself includes two isomorphic figures: c; this last group—which is divisible—divides the second isomorphic figure bd into two unequal parts: b (one note, G♯) and d (three notes: D♭ C♯ Eb). Thus there is, on the one hand, manifest symmetry within c and, on the other hand, concealed symmetry between a and the two fragments b, d. In addition the intervals which relate the groups to each other are the same as the fundamental intervals of the groups: whole tone, semitone and fourth.

A single series can obey several isomorphic laws. A figure of three notes (e.g. B♭ B♭ D♭) may undergo an augmentation (E♭ C♯ A♭) in which all its intervals are doubled, and then appear in a symmetrical, retrograde form (G♯ F♯ E♭); finally, to complete the twelve notes, a figure is added which is irreducible to the principal figure.

![Image of musical notation]

What do we notice? Other isomorphic relationships result from this triple succession of three-note isomorphic figures. There are two four-note figures linked by very obvious relationships; these include a pair of intervals a, separated by another interval b, a and b being interchanged from the first to the second group. The first pair of intervals, two minor seconds (B♭–B♭/D♭–E♭), is separated by a major third; the second pair, two major thirds (C♯–A♭/G♯–E♭), is separated by a minor second (A♭–G♯). The minor seconds are inverted in relation to each other (descending and ascending seconds), whereas the major thirds are parallel (descending); moreover, one of the central intervals that act as axes of symmetry is ascending, the
other descending. The third four-note figure is irreducible. Once more let us take the same three-note figure; this time it will be augmented, then inverted, and to complete the twelve notes, another irreducible figure will be added to it.

What do we notice now? Two isomorphic figures, each of five notes, the second of which is the retrograde of the first; the last three notes correspond to the first three, by retrogradation (B♭B♭D♭-G♯E♭F♯); from the pivotal third note, the retrograde is combined with inversion of the intervals (D♭E♭C♯-A♭G♯G♯). The final figure of two notes (C♯F♯) is apparently irreducible to the other two. Notice, however, that the interval between the last note of the second figure and the first of these terminal notes is the same as that between the second of these two notes and the first note of the first figure (F♯-C♯/F♯-B♭); if the second note (F♯) is placed at the beginning of the series, we shall have two six-note isomorphic figures. This series will obey two different isomorphisms; the first, partial, forming three figures; the second, total, forming two.

Finally, there are totally asymmetrical series; these occur principally when a limited number of elements is used, because isomorphic elements are almost inevitable, even if only of a single interval or a given proportion, as soon as the number of basic elements increases.

In conclusion, there are three distinct types of serial structure:
—totally symmetrical
—partially symmetrical and asymmetrical
  manifest isomorphic figures
  concealed isomorphic figures
—totally asymmetrical.

Boulez notes, “If I have dwelt at length on the structure of the series itself, it is because it forms the basis of an entire organization of series derived from it.”

Thus Boulez’s method of making music can be seen as one in which some kind of mathematical equations have displaced man as the center of art. Purpose and intention have capitulated to structure and systemic and also in li structural Strauss he moves from the Contrapuntal person in unique by the Helffer, there is a structure, ture of the thing, he believes: if i

The principle of propositional is something of meaning, Boul...