SOME STRIKING PROPORTIONS IN THE MUSIC OF BELA BARTÓK

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Unlike the techniques discussed in a previous article*, relatively simple Fibonacci proportions can be used in the organization of larger units of musical time. In common diatonic practices the lengths of phrases and sections, expressed in measures, are generally some power of two: four, eight, sixteen, and thirty-two. Fibonacci numbers, as numerical expressions of the golden mean, offer other ways of creating proportion which largely avoid these divisions. Naturally, just as the older phrases could be sometimes extended, shortened, or grouped in unusual ways without destroying the overall sense of balance, Fibonacci proportions need not always be exact or consistent to achieve their intended effect.

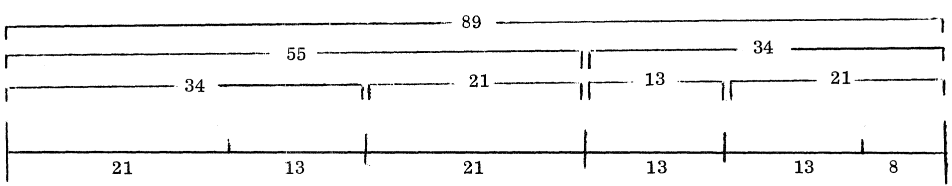
Many contemporary composers are using Fibonacci proportions in this way, but some of the most striking examples are found in the music of an earlier master: Bartók. Bartók's use of Fibonacci proportions evidently springs from an interest in the golden mean. Ernő Lendvai, in his book _Bartók: sa vie et son oeuvre_ (Budapest, 1957), has pointed out many examples from Bartók's music where the golden mean is the major dividing point of a piece.

If a unity is divided into two parts according to the golden mean, the larger part will be 0.618 and the smaller will be 0.382. The first movement for the _Sonata for Two Pianos and Percussion_ has 443 measures, and its golden mean is therefore 443 x 0.618 = 274. The recapitulation (the return to material from the beginning) begins in measure 274. In the first movement of the _Divertimento for String Orchestra_, the recapitulation begins at the golden mean (measured in ternary units instead of measures to compensate for meter changes), as it does also in the first movement of _Contrasts_. Three examples are cited from the sixth volume of _Mikrokosmos_. In "Free Variations," the golden mean comes at the _molto più calmo_; in "From the Diary of a Fly," it falls at the climax (which is marked with a double

* "An Example of Fibonacci Numbers Used to Generate Rhythmic Values in Modern Music," this Quarterly, Vol. 9, No. 4, pp. 423-426.

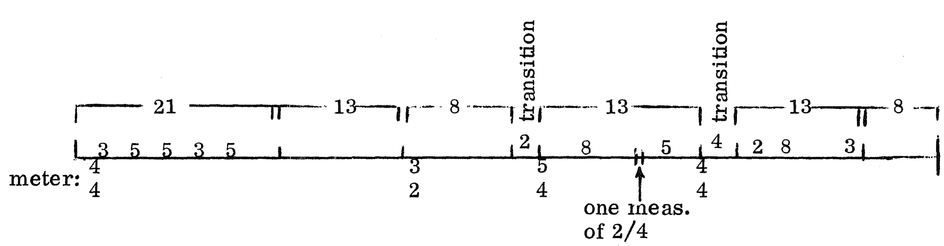
sforzando), and in "Divided Arpeggios," the recapitulation begins at the golden mean.

It is only one step further to casting subdivisions in Fibonacci proportions. The first movement of Music for Strings, Percussion, and Celeste is 88 measures long. If we allow a measure's silence at the end, we have 89. The fff climax of the movement arrives after 55 measures, of which the strings play the first 34 with mutes, removing them for the last 21. The first 34 measures are subdivided further, as the exposition (the movement is a fugue) is 21 bars long. The 34 measures following the climax are divided into 13 and 21 by the replacement of the mutes at measure 69, and the final 21 measures are divided again by a change of texture into groups of thirteen and eight. The following diagram illustrates these divisions. It will be noted also that before the climax longer units are followed by shorter ones, while the reverse tends to be true after the climax. Thus pace becomes a major factor in shaping the movement.



First Movement of Music for Strings, Percussion, and Celeste

A diagram of the third movement of Music shows considerable, but not exclusive use of Fibonacci porportions. Here the smaller units are cast mostly in the familiar fives, eights, and thirteens, but the overall balance of the movement is less obvious, and highly individual.



Third Movement of Music for Strings, Percussion, and Celeste

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