



SOUND PATTERN AND MOVEMENT:  
INTRODUCTION TO A NEUROPHYSIOLOGICALLY BASED THEORY OF MUSICAL RHYTHM

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Beat and rhythm in music incite the feet to dance. Their powerful influence on the form of movement has not been adequately studied scientifically. A theory of beat and rhythm which elucidates the various kinds of energy and qualities of experience engendered has been lacking, particularly in Western Music.

In this paper we shall present movement forms that result from various repeated combinations of single and paired tone bursts of different durations and amplitudes, constituting elemental beat forms or "driving functions". Resulting movement forms are measured as finger pressure transients which are produced rhythmically while listening to the patterns tested. The repeated movements are averaged on a CAT computer and read out on an X-Y plotter for each pattern tested. The patterns thus obtained show a wide variety of forms and forcefulness and are stable for a particular sound pattern. These output measurements delineate how characteristic muscular action is fitted to specific sound "initiators". For example, the lowest point of a down beat synchronizes quite differently with the musical time, depending on the type of beat and rhythm. Differences between Beethoven and Mozart in this respect will be shown, as well as input-output phenomena specific to rock music and acid rock.

The beat of a piece of music may be represented by a particular driving function. Rhythmic movement forms obtained by this method from rock and classical music may be compared with the driving function patterns tested, and it can be shown how the music implies the elemental beat forms or driving functions which produce the movement forms. The durations involved are far more subtle than are capable of being notated through musical notation. The results, combined with previous findings on the property of the central nervous system of time form printing (Clynes: Society for Neuroscience Annual Meeting, Abstract, 1977, and The Communication of Emotion: Theory of Sentic, in Theories of Emotions by J. R. Plutchik, Academic Press 1980) may be regarded as elements for a theory of musical rhythm with neurophysiological foundation.