

## NOTE ON PULSATION AND POETRY

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**P**ulsation is defined in the Oxford English Dictionary as: ‘Rhythmical expansion and contraction; beating, throbbing, vibration.’ Oscillate is defined as: ‘Swing to and fro. Vibrate.’ But the German Wahrig Dictionary provides a clear distinction between Pulsation and Oscillation. Pulsation is (I translate): ‘Activity of the heart; the consequently evident pressure-waves in the arterial vascular system’. Oscillation is: ‘Swinging; regular movements’.

Oscillation, for example in a twanging guitar string or a pendulum, is regular and ‘equal phase’. Pulsation is, like the heartbeat, ‘unequal phase’. It can be used to distinguish the living (e.g. a jellyfish) from the non-living (e.g. a ringing bell). Graphs of electrocardiograms (ECG) and brain blood oxygenation show an unequal-phase rise and fall. If you pay attention to your (or any animal’s) breathing you will see that in-breath and out-breath (unless under extreme stress in panting or gasping) are unequal phase with a ratio of about 2:3.

Pulsation is a sign of life in music and in poetry too – except often for ‘free verse’ which risks not being poetry at all unless its rhythms are strong enough to carry emotion as pulsation does.

Robert Graves wrote about ‘Anvil and Oar’ in stressed verse. The guiding tap or taps from the blacksmith’s small hammer

preceding the bang from the apprentice's sledgehammer form something like a Greek Iambic, and in ancient Ireland Brigit was the goddess of poets and blacksmiths. The pull of the oars in Anglo-Saxon and Viking boats matches the *Beowulf* four-stress line.

Superficially the *Beowulf* line is 'equal phase' – two stresses / two stresses. But although Olympic rowers may use a technique allowing two breaths per stroke, in normal rowing you breathe *in* on the 'recovery' (when you push the oars forward with the blades out of the water), then *out* on the longer phased 'drive' when you pull the oar towards you through the water.

In the following two lines from *The Battle of Maldon*, each stress with its following syllable or syllables is itself an unequal-phase pulsation. At first this seems in reverse because we think of in-breath then out-breath, but if you think of the stressed (marked) syllable as corresponding with the out-breath on the drive, and the unstressed syllable(s) as the in-breath on the recovery, each stress is longer than the unstressed phase. (And note how each stress is linked to others by alliteration). You can imagine fast rowing:

Tha **Byhrtnoth** **brace-d bill** of **scethe**,  
**Brad** and **bruneccg**, and on the **byrnan sloh**.

[Then Byrthnoth drew his sword from his sheath  
 Broad and bright-bladed, and on the chainmail struck.]

The Old Irish poetry cited by Graves typically has lines of seven syllables. In the Late Middle Ages Irish poetry adopted new stress metres from French and English sources but the syllabic metres still survive, e.g. in many of the modern Scottish Gaelic poems of Sorley MacLean. These metres contain various rhyming and alliteration patterns which link the last syllables and middle syllables of alternating lines – the middle syllable of a seven-syllable line being either the third or the fourth. This creates a sort of pulsation and counter-pulsation, expressive of changing emotion.

The 5-stress line which has settled itself into English (not exactly an 'iambic pentameter', as is sometimes taught, because

it may contain extra syllables and reversals which break the metrical ‘tum-ti-tum-ti-tum-ti’ effect) typically has an unequal phase rise and fall. It is remarkably like a breath (human or animal) in that there is a slight fall in tone after the second stress. Take Shakespeare’s

When **I** do count the **clock** that **tells** the **time**  
 And **see** the brave **day** sunk in **hideous** **night**.

Shakespeare varies the ‘tum-ti-tum’ of the five stresses, but both lines follow the 2:3 ratio of the breathing pulsation, with a slight lilt I have marked by the underlined words.

Furthermore each stress in a 5-stress line roughly equates to a heartbeat, i.e. 5 beats to a line.

Since average respiration rate is 12 to 15 breaths a minute, and average heartbeat is about 68, a sonnet at 14-lines long and 70 stress-beats takes almost exactly a minute to read! A sonnet is 14 breaths and 70 heartbeats. A sonnet is a minute. Why this coincidence?

I can’t answer the question, but I can point to the phenomenon. Perhaps a study of poetic forms would reveal other such correspondences between them and biological pulsation.