

Narayana's Cows – Compositional Study #1

Holger H. Hoos (1996)

The title of the piece reflects its main inspiration – a composition by Tom Johnson presented at the JIM'96 conference in Normandy. The numerical series used in both Johnson's and this composition is attributed to Narayana, an ancient Indian mathematician who used it in the context of a (rather abstract) problem dealing with the development of a population of cows.

The work is based on two simple mathematical series and the corresponding delayed morphisms (*cf* Tom Johnson's book "Self-Similar Melodies", 1996 by Edition 75, Paris). Basically, two series – the well-known Fibonacci series and the less prominent Narayana series – are used to deterministically define a series of numeric sequences which are self-similar in the limit. These sequences, which represent the different generations of cows, are mapped onto melodies in a uniform way. The piece has two parts, "Introduction – The Herd" and "Polylogue".

In the first part, starting from the one-note melody of the first generation, new generations of cows join the herd; as they age, their movement becomes slower, their base pitch lower and their leaps grow smaller, until they finally die. Each generation is more complex than the preceding one, thus the characteristic melody becomes more and more complex. However, in the end sudden infertility prevents new generations to be born and thus this part ends with the last generation dying – answered by a faint echo of a fragment of their song.

The second part is based on the same compositional material, the generations of cows' melodies as presented in part 1. However, now a series of two-part and later three-part polylogues unfolds over a bass which is a very slow and low-pitched version of the main theme. The overall structure of this part is ABA', where A and A' are mirror images with respect to their upper voices (which form a series of dialogues), and B is a series of 3-part polylogues constructed in a strictly analogous manner to the dialogues in A.

In its present form, the piece is actually incomplete – there should be a 3rd part "Nirvana" which has not been realised yet.