

**THE GOLDEN FLUTE OF GEISSENKLÖSTERLE**

**MATHEMATICAL EVIDENCE FOR A CONTINUITY OF HUMAN INTELLIGENCE AS OPPOSED TO EVOLUTIONARY CHANGE THROUGH TIME**

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**Abstract.** Due to the overwhelming acceptance of Darwin-based ideas in modern science a belief is perpetuated that everything can now be explained in terms of gradual evolution. However, unexpected mathematical qualities of Palaeolithic engraved artifacts create difficulties for the evolutionary paradigm. In three studies of a 35–40,000-year old bird-bone flute from Geissenklösterle, Germany, and comparison with a 400,000-year old engraved bone artifact from Bilzingsleben, I demonstrate that one aspect of the evolutionary paradigm is clearly false, namely the idea of cognitive evolution or that the human species has become gradually more and more intelligent over time. In a prior paper it was suggested that one way to approach the subject of the intelligence of early peoples, even with evidence as limited as a single artifact, was by noting the possible presence of mathematical constants whose deliberate representation within an artifact might be confirmed by their repetition. This was proposed in relation to the golden ratio (1.618), also known as phi. Positive results reveal artifacts whose true significance may extend well beyond restrictions placed upon their interpretation through an assumed evolution and which may actually have served mathematical purposes such as measuring or calculating and with sophisticated non-mathematical uses very likely. These non-evolution-based ideas are possible only if we consider the makers of the artifacts to have been our equals though with perhaps very different value systems than we have today.

**Key words.** cognitive evolution, *Homo erectus*, golden ratio, Paleolithic mathematics

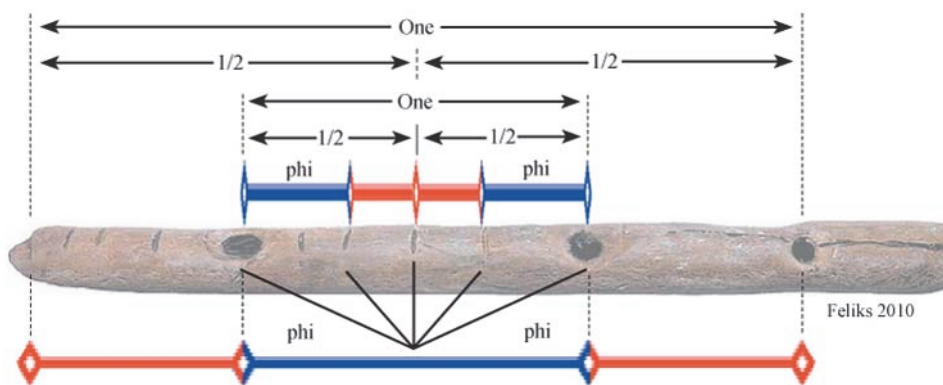
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**1. The idea of cognition evolution**

The idea that humans become gradually more and more intelligent over time was first advanced as an aspect of evolution by Charles Darwin in his 1859 book, *On the Origin of Species*:

“Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history.” –Charles Darwin, 1859: 488

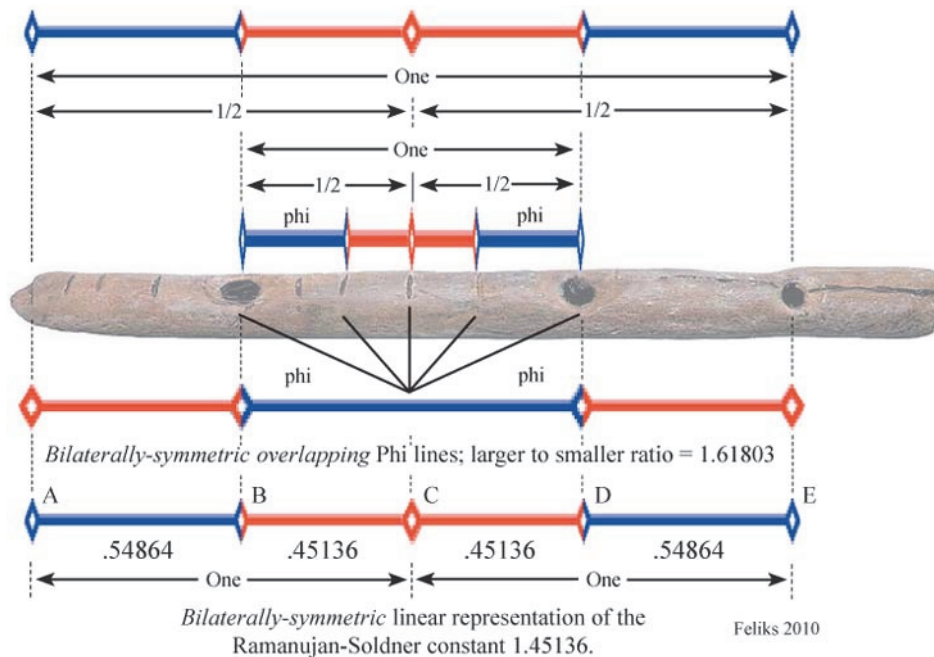
This view of human history is accepted as a given in both evolutionary psychology and evolutionary anthropology based not on archaeological evidence but upon faith in the general template of Darwinism and that this template can be applied to anything including things related to the functioning of human mentality. The sequence of human lineage is commonly taught as beginning with ancestors of an ‘ape-like’ mentality such as *Australopithecus* (several million years ago). The lineage then passes through a stage of mentally ‘half-way-there’ ancestors, e.g., *Homo erectus* (roughly 2 million to 300,000 years ago). This stage is followed by an ‘almost-there’ stage of semi-intelligent *Homo sapiens* including Neanderthal people (roughly 300,000 to 50,000 years ago). And finally, the story culminates in highly-intelligent modern *Homo sapiens*, purportedly continuing to increase in intelligence over the next 50,000 years until they reach our own present level. However, if the golden ratio studies of a 40,000-year old flute from Geissenklösterle, Germany (Figs. 1 & 2) accurately represent the level of sophistication present in early *Homo sapiens* or Neanderthals then they assuredly do not support the idea that we ourselves are any more evolved.



**Fig. 1:** Replica of the 35,000–40,000-year old swan bone flute from Geissenklösterle, Germany (original 126mm in length), showing a few of its many measures of the golden ratio or phi. This figure is used to demonstrate the concept of phi measurements or ‘phi-based conceptual units’ as a means for understanding early artifacts and the mentality of those who created them. The flute is one of the three oldest-known musical instruments, all three of which are flutes from Geissenklösterle. It was reconstructed from 23 pieces. The studies in this paper are based on the replica at the Parque de la Prehistoria in Teverga, Spain. This figure shows the golden ratio or phi in bilateral symmetry. The golden ratio as represented here can be understood like this: The length of one blue section plus the length of one red section equals 1. The diamond-shaped marker where blue and red sections meet occurs at 0.618 along the length of a two-part blue-red line; this is known as the gold point or golden mean. The unique quality of the golden ratio can be described in this way: The ratio between the larger and smaller sections is exactly the same as the ratio between the combined length of the two sections and the larger section. The golden ratio is a ubiquitous aspect of nature and of which there is only one such ratio with as many qualities. (NOTE: The golden ratio is actually an irrational number whose value has been calculated to as many as 3,141,000,000 digits so far; it is, in fact, the “most irrational number”—a real number that cannot be represented as a fraction. However, with the first few digits being 1.61803, it rounds off nicely to 1.618.) Geissenklösterle flute replica photo by José-Manuel Benito; public domain. Geometric study © John Feliks 2010.

As hard to believe as it may seem, adherence to the idea of cognitive evolution in anthropology and psychology had even resulted in assumptions that human beings living today must somehow be more intelligent than such as the ancient Greeks, Egyptians or Babylonians and even subtly more

intelligent than people living within the past 500 years. This is how far a paradigm can go when allegiance becomes more important than what the facts actually tell us. Even a cursory examination of Plato, *The Book of Job*, or the *Epic of Gilgamesh* should put all such thinking to rest; and it is likely that Paleolithic artifacts will one day help us to understand our early ancestors in the same way.



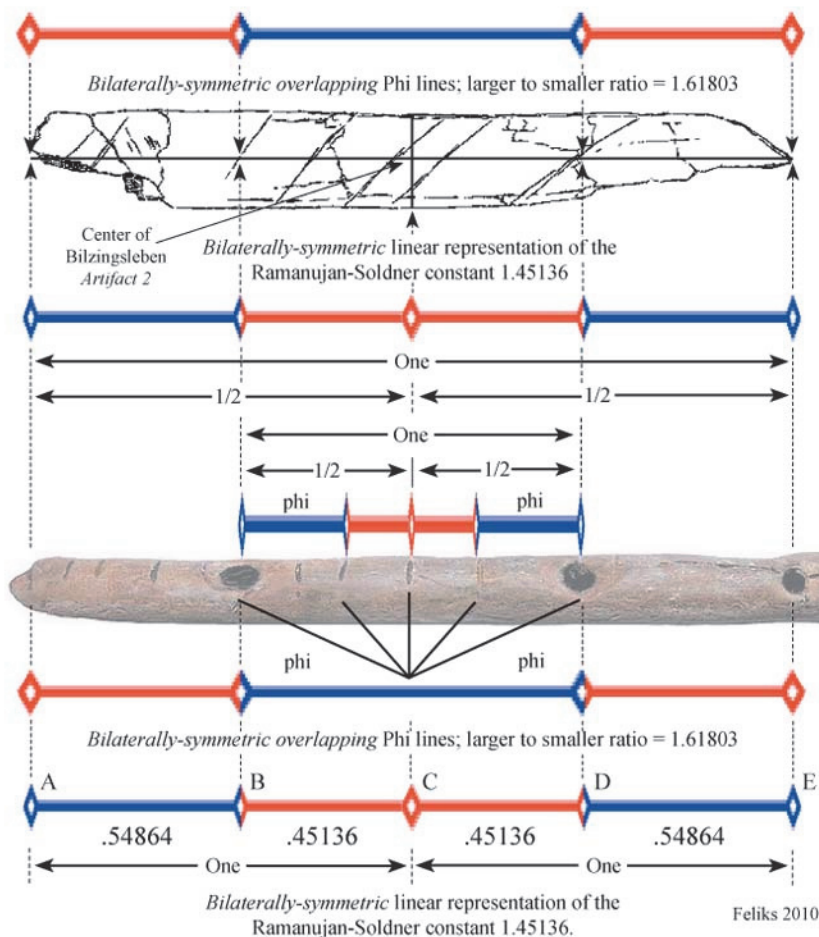
**Fig. 2:** Linear representation of the Ramanujan-Soldner constant, 1.45136 ( $AC + CD = AD$ ) abbreviated, in bilateral symmetry overlain upon the golden ratio measures in bilateral symmetry. It is not suggested that this relatively unknown mathematical constant by popular standards (one defined as the unique positive zero of the logarithmic integral function) was deliberately employed by the Geissenklösterle artisan but is only used here as a measuring device. In fact, it was through studying the artifact replica's phi geometry that the author, a non-mathematician, learned about this ratio and its closeness to phi ( $BD$  or  $.90272$  divided by  $AD$  or  $1.45136\% = 62.198\%$  or  $.62198$ ; phi is  $.61803$ ). Geometric study © John Feliks 2010.

## 2. Continuity by way of constants as opposed to evolution

The cognitive evolution paradigm has been so heavily promoted in science as to create an impression in the public's mind that it is obvious. However, the weaknesses of this paradigm are apparent the moment one begins to look at the evidence objectively outside control of the consensus scientific community. The particular evidence offered in this and a prior paper is the presence of the golden ratio observable in bone engravings and other artifacts. These observations suggest that there has been no change whatsoever in human cognitive ability whether over tens or hundreds of thousands of years. The idea of a continuity of human intelligence is extendable by other means as far back in time to whatever point we consider as representing the first appearance of human beings.

At the XV UISPP Congress, Lisbon 2006, I presented two 56-slide programs on the mathematical and graphic capabilities of *Homo erectus* people. At the time of this writing the Part 1 paper, *The Graphics of Bilzingsleben*, has not yet been published. It contains clear evidence that human intelligence does not evolve including evidence of straight edge use by *Homo erectus*. The Part 2

paper, *Phi in the Acheulian*, was published in 2008 without the benefit of the Part 1 introductory paper and so, its suggestion of the presence of mathematical constants in the Bilzingsleben engravings seemed to have been so far beyond the capabilities of *Homo erectus* as to have appeared out of the blue. In that paper, the idea of ‘phi-based conceptual units’ was introduced as a testable means of proving early human intelligence over hundreds of thousands of years. It was shown that *Homo erectus*, long regarded as an “ape-man,” made unambiguous use of what is known as the golden ratio or phi (1.618). As a follow-up in 2010, SCIENAR mathematics group published *Phi-based conceptual units: Pushing math origins back to the Acheulian age*. In these papers, a study of Bilzingsleben Artifact 2 was featured in which a golden ratio compass and straightedge study by Austrian installation artist Kurt Hofstetter was superimposed over the engraved lines of the artifact showing that a similar conceptual base was somehow at work even though one of the artists was a modern individual and the other a *Homo erectus* person living 400,000 years earlier. Below is a similar study relating Bilzingsleben Artifact 2 with the flute of Geissenklösterle (Fig. 3).



**Fig. 3:** Comparing the 40,000-year old swan bone flute from Geissenklösterle, Germany, with the 400,000-year old Artifact 2 engraved rib bone (rib bone of a large unidentified mammal) from Bilzingsleben, Germany. The two objects are overlain with linear representations of the mathematical constants of the golden ratio and the Ramanujan-Soldner constant (ACD, ECB) to demonstrate that the same level of human cognitive ability existed in the much earlier *Homo erectus* as did in the later Neanderthals and *Homo sapiens*. (NOTES: The artifacts are not to scale. The mammal bone is 286mm; the swan bone, 126mm. The Ramanujan-Soldner constant is used here simply as a measuring device and not to suggest that the makers of either artifact were aware of that particular constant.)

*The golden mean qualities of Bilzingsleben Artifact 2 have already been demonstrated in detail (Feliks 2008, 2010) suggesting use of the ratio in engraved artifacts either deliberately or intuitively 400,000 years ago and developing a case for why this might have occurred. Artifact 2 was also suggested for its potential use as a straightedge (2006 and 2010, in press) and measuring or calculating device, an idea which played off of the original suggestion of its discoverers, Dietrich and Ursula Mania, that it might represent a sort of mnemonic or recall-assisting device; Mania and Mania 1988. Similar uses (i.e. apart from musical) are suggested for the flute of Geissenklösterle. Artifact 2 redrawn after Mania and Mania 1988. Geissenklösterle flute replica photo by José-Manuel Benito; public domain. Geometric study © John Feliks 2010.*

### 3. Regional as well as design coherence

As far as concerns how the flute of Geissenklösterle and the engraved bone of Bilzingsleben are related, not only do they demonstrate a conceptual similarity in their graphic layouts but there are other implications as well, not least being that the two archaeological sites where the artifacts were found are in the same geographic neighborhood. Geissenklösterle is only c. 320 kilometers (200 miles) south of Bilzingsleben in southern Germany. This means that the two artifacts share an indisputable regional coherence as well as design coherence.

### 4. Conclusion regarding the people of Geissenklösterle and the artifact

The mathematical similarities observed between the flute of Geissenklösterle and the artifact from Bilzingsleben can be extrapolated to conclude that the capabilities of Neanderthals and modern *Homo sapiens* in general were not in any significant way more highly-developed than those of the *Homo erectus* people who preceded them. This, along with the added dimension of close proximity between the artifacts supports the more specific conclusion that no evolution of cognitive abilities had occurred within a specific geographic region even after 400,000 years. In fact, the possibility that ancestral traditions from the deep past were valued enough to somehow be preserved across vast stretches of time is not beyond the range of reasonable conjecture in light of the evidence.

In these and similar studies, the geometry is allowed to speak for itself as to whether or not the golden ratio is present in such artifacts. Also, the tolerances applied are clearly visible and comparable with those made for modern artworks. The determination of whether or not the golden ratio's presence is the result of deliberate action or the result of an intuitive artistic sense is left open. Either way, the evidence forces us to consider two equally profound possibilities. 1.) If deliberate, then the accuracy and repeated use of the ratio as represented in these artifacts are in many cases greater than anything typically produced by modern *Homo sapiens* apart from deliberate demonstrations or deliberate study of the golden ratio. 2.) If intuitive, then the conclusion must be made that the level of human intuition toward the golden ratio inherent in *Homo erectus* and the people of Geissenklösterle was remarkably high suggesting that they were more in touch with nature on a fundamental level than we are today. In other words, it can easily be suggested that *Homo erectus*, Neanderthals, and early modern *Homo sapiens* were in a more harmonious state with their environment because the ratio so prevalent in their artifacts is also one of the most ubiquitous in the natural and biological world.

To conclude on a very specific level, these studies are offered as more evidence that the golden ratio may have been well-understood by our early ancestors and perhaps even highly valued throughout the Lower, Middle, and Upper Palaeolithic ages. Clearly, in the case of the flute of Geissenklösterle we are talking about more than a musical instrument due to the engraved lines, perhaps a “mathematical instrument,” in its own way and for its own time every bit as sophisticated as a slide rule.

### About the author

John Feliks has specialized in the study of early human cognition for nearly twenty years using an approach based primarily on geometry and techniques of drafting. Feliks is not a mathematician, and, in fact, is very limited in the field; however, he uses the mathematics of ancient artifacts to prove that human cognition, as far as the species as a whole is concerned, does not evolve and that early humans living hundreds of thousands and even millions of years ago were just as intelligent as anyone living in today's world. He is founder of the Pleistocene Coalition, a group challenging mainstream science peer review which prevents evidence not adhering to the standard Darwinian template from being published. He is also layout editor for the group's newsletter, *Pleistocene Coalition News*. One aspect of Feliks' background that helps in the study of ancient artifacts and their mathematical or symbolic qualities is that he has been a long-time composer in a Bach-like tradition as well as a songwriter in the folk-rock tradition and taught computer music including MIDI, digital audio editing, and music notation for 11 years. This musical background was part of the inspiration to study the flute of Geissenklösterle.

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