

Illiterate Indus?

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Abstract

Farmer, Sproat and Witzel (2004) have argued in a paper (henceforth referred to as FSW) that the Indus inscriptions do not encode speech and that the Harappan civilization was illiterate. This paper is a systematic analysis of FSW and the evidence furnished therein, with the goal of determining the validity of the arguments.

1. Introduction

Even after spending several decades, the Indus script has not been deciphered. Therefore, it is refreshing to read a paper where the fundamentals are questioned relentlessly. However, most of the arguments made by the paper can be rebutted. For a severe criticism of FSW including FSW's inappropriate language and tone, see Massimo Vidale's recent paper (Vidale 2009). A few reviewers did suggest that this paper consider only a few key points, but that approach would leave the validity, in doubt, of the points that are excluded. Hence this paper makes an attempt to capture all the major arguments made by FSW and analyze their validity.

2. Response to the FSW paper

2.1 Arguments considering the Indus Script to be writing

1. FSW p26: there are too many singletons and low frequency signs and paradoxical sign frequencies.

This assertion of FSW seems probable at first sight and lends credence to the opinion that Indus inscriptions do not encode speech. But when the sign frequencies in the Mahadevan (1977) concordance (which is a key reference for FSW) are reviewed, a different picture emerges. In a scientific paper, when sign frequencies are debated, one would expect to see a table with all the relevant counts and percentages, so that the reader can make informed decisions on his/her own. Such a table is noticeably absent in FSW.

Therefore, this paper reproduces the sign occurrences table from the Mahadevan 1977 concordance as Table 1.

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Frequency Range in M77		In M77	
	No. of signs	Total sign occurrences	Total sign occurrences (in percent)
>1000	1	1395	10.43
999-500	1	649	4.85
499-100	31	6344	47.44
99-50	34	2381	17.81
49-10	86	1833	13.71
9-2	152	658	4.92
1	112	112	0.84
0	0	-	-
Total	417	13372	100.00

Table 1

Table 1 shows that:

1. Singletons occur just 0.84% across all the inscriptions. According to FSW, it is 27%.
2. Signs with two to nine occurrences form 4.92%. According to FSW, it is 52% for signs with less than 5 occurrences.
3. The occurrence of the top two signs is 15.28%. FSW states that the top four signs form 21% of the occurrences.
4. 34 signs occur 62.72% across all inscriptions. Whereas, FSW states that a mere eight signs make up 31% and 20 signs make up over 50% of all sign occurrences.

While on points 3 and 4, Mahadevan and FSW reach similar conclusions, points 1 and 2 are quite different. What contributes to such a difference over the percentages? This is what FSW has done:

- a) For the first two data points above, FSW uses the percentage of signs - there are 112 singletons, which form 26.8% (~ 27%) of 417 signs. The second data point of 52% is obtained in a similar fashion. FSW p 36, line 15, actually states "27% of the 417 signs in the Mahadevan concordance occurs only once in 13,372 sign occurrences; 52% show up five times or less" which is an egregious error in an area that is foundational to FSW's thesis.
- b) For the third and fourth data points, FSW uses percentage of occurrences amongst the 13,372 occurrences.

In sum, signs occurring zero to nine times form just 5.76% of the total number of occurrences. This greatly weakens FSW's argument on the preponderance of singletons and low frequency signs. The FSW argument that four signs form over 21% of the occurrences, while true, is another weak one. In English for example, the letters E,T,A (three signs) occur nearly 25% of the time in documents.

Further, FSW states (p36) that while many complex symbols are compounds of simpler ones, an overwhelming majority of symbols are not of this category. Why should that be true? Is there any rule which says, scripts should be composed with complex signs in the majority?

FSW has not compared the distributions with other similar languages to show why the Indus inscriptions' frequency distribution is a problem. In the absence of such comparisons, FSW's conclusions seem arbitrary.

2. FSW p27: *high sign frequencies appear in Scottish heraldic symbols. Ergo, that is not a reliable test to distinguish a script from a non-script.*

FSW tries to prove the inapplicability of Zipf's Law by analyzing Sumerian, Egyptian, Indus A & Indus B (Mahadevan 1977 and Wells concordances), Chinese news headlines, Chinese newspaper stories and Scottish heraldic emblems.

This analysis from FSW is reproduced below:

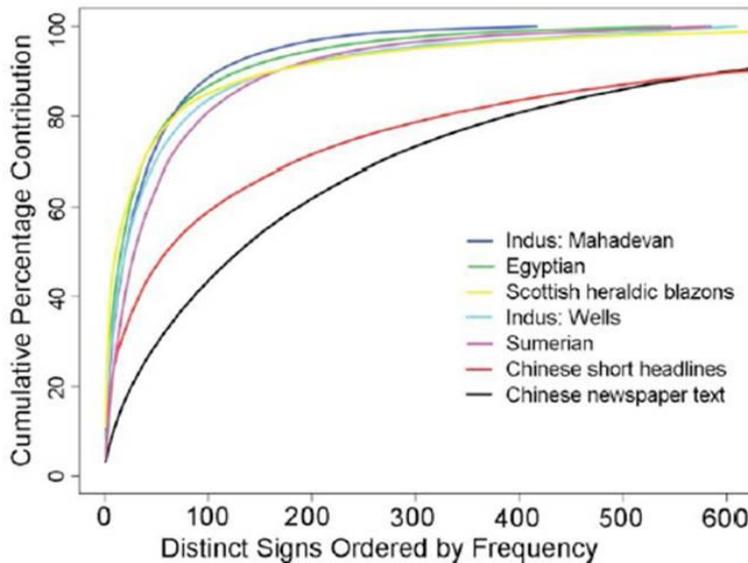


Figure 2. Cumulative frequencies of signs in various linguistic and nonlinguistic corpora. The horizontal axis represents distinct signs ordered by decreasing frequency. The vertical axis represents the contribution of all signs up to a given rank. Only the first 600 or so signs are mapped for scripts like Chinese that contain higher numbers of signs. For the sources of our data, see n. 12.

Figure 1

As FSW says already in the paper (p28), it is well known that Zipf's Law has been applied to non-linguistic domains (Wentian Li 2008). However, that fact alone does not necessarily make Zipf's Law inapplicable in the linguistic domain. Zipf's Law fit is determined using curve fitting techniques which are inherently probabilistic. If a symbol system like the Indus signs fits the pattern predicted by Zipf's Law, it just shows that the likelihood/probability that it encodes speech is high and is not a certainty.

A single counter example suffices only when a system is dealing in absolutes. For example, if someone said all swans are white in color, one counter example would suffice to disprove that statement.

To conclude that Zipf's Law is not a valid test to distinguish scripts from non-scripts, FSW has to show that, even if the Zipf's Law pattern holds true for a symbol system, the probability that it is linguistic is low. FSW cannot accomplish that proof using a single non-linguistic system (Scottish heraldry signs) that fits the Zipf's Law pattern.

FSW's approach shows a pronounced confirmation bias, because the choice of Scottish heraldry symbols, begs several questions – a. Why were other symbol systems from the ancient world, which are available aplenty, not used in the analysis, but Scottish heraldry emblems are used, which is from a medieval European culture? b. Why use only the Mitchell Rolls (FSW p13 footnote 12) subset, and not the entire set of Scottish heraldry emblems? c. Why are Vinca symbols, which FSW later compares the Indus system to, in the same paper, not included in the analysis? d. Why are Native American Totemic symbols, used as a comparator in another FSW citation (Farmer 2004b), not included in the analysis?

Instead FSW should have used a more robust stratified sample for this analysis to prove the point. FSW has used 2 stratum – a linguistic systems stratum which includes 6 data sets (Stratum 1) and a non-linguistic systems stratum which includes 1 data set (Stratum 2). First, FSW should have used a larger sample for Stratum 1 by increasing the number of linguistic systems. Additionally, the sample should also include linguistic systems for which the sign frequency does not fit the Zipf's Law pattern. Second, for Stratum 2, FSW should have used a larger sample by increasing the number of non-linguistic systems. Additionally, the sample should include symbol systems from cultures that have a separate writing system as well (like Scottish heraldry) as well as from those that don't have a separate writing system (like Vinca).

The reason one needs to look at symbol systems from cultures which do not, have a separate writing system alongside those that do, is because, it gives pointers to how these cultures dealt with non-linguistic symbols. For example, the emblem of the Heraldry Society of Scotland available at <http://www.heraldry-scotland.co.uk/societyarms.html> (FSW p13 footnote 12) has symbols from the writing system as well. If the non-linguistic system is complete, why would they need to augment it with symbols from the writing system?

FSW needs to include, a rigorous stratified sample analysis as described above, for the argument about the non-applicability of Zipf's Law, in the linguistic context to hold true.

Interestingly, if one excludes Scottish heraldry signs from Figure 1, FSW's own analysis shows that Indus A/B correlates closely with Egyptian and Sumerian! That correlation actually shows support for the hypothesis that Indus is a logosyllabic script.

3. FSW p24: *there are no scribbled messages from scribes, typical of a literate society. Potsherds with crude markings are not acceptable because it appears the inscriptions were inscribed before the pot was broken.*

A valid point. However, Indologists know, that to this day, children write on a bed of sand/clay or a bed of rice, when they begin to write. Maybe the Harappan scribes used such a technique to practice their script. This technique would not obviously leave any archaeological artifacts. Absence of evidence is not evidence of absence.

4. FSW p33: *eventually all scripts evolve into phonetic writing. No such evolution was observed in the Indus Script.*

There is at least one important exception – Chinese. It remains logo-graphic to this date. That disproves FSW's generalization.

5. FSW p37: *The presence of singletons and clustered ligatured signs indicate that the script was not even frozen. Highly evolved scripts don't admit symbols in a hurry.*

In determining script evolution, linguists look for multiple representations of the same sign, ligaturing, compound signs (formed from simpler signs) and increasing semantic range. FSW agrees that all these characteristics are present in the Indus Script.

According to FSW, the growing number of singletons and the presence of clustered signs is a sign of an unfrozen script. Instead of taking the growing numbers of signs as an indicator of evolution, FSW dismisses it as a sign of an “unfrozen” script.

FSW states (p37) that highly evolved scripts do not "admit" new symbols in a hurry. But, FSW agrees that thousands of new symbols were added to Egyptian hieroglyphics in the Graeco-Roman period. FSW argues that these new symbols were never meant to be interpreted. The Egyptian hieroglyphic for "L" started appearing in cartouches after the Graeco-Roman period. One can be pretty sure Cleopatra wanted her name to be interpreted. This disproves FSW's claim that evolved scripts do not admit new signs.

The later Indus inscriptions are considerably longer. This is another sign of script evolution which again FSW does not take into account as an indicator of script evolution.

6. FSW p26: *no inscriptions were found on durable materials like rocks, stones, cliff faces, caves etc.*

The earliest inscriptions from China were on bones. Therefore, writing on durable material does not seem to be a thumb-rule to determine the literacy in a society.

7. FSW p25: *we are yet to discover a writing instrument.*

A valid point.

8. FSW p37: *lexical lists similar to the near eastern scripts have not been found.*

Lexical lists were found for Akkadian, Sumerian and Hittite languages. Akkadian and Sumerian are the two peoples that populated the same geographical area. Akkadian cuneiform is a derivative of the Sumerian version. Since Hittites ruled over many parts of Sumer, their script was copied from Akkadian cuneiform (Wikipedia Cuneiform 2008).

It is important to note that not all West Asian scripts had lexical lists. It is a sweeping generalization to state that the presence of a script mandates the use of lexical lists. Proto-Elamite and the later Linear Elamite, which are the other West Asian scripts, are yet to be deciphered. Whether they had lexical lists is something no one knows.

There is no data to prove that the usage of lexical lists is a characteristic of all kinds of scripts.

9. FSW p26: *there are disputes even in the count of signs among proponents of a literate Indus – Mahadevan/Parpola [300-400], B Wells[600] and SR Rao [20].*

Virtually no researcher considers SR Rao's count of 20 signs seriously. Witzel (2005) himself has severely criticized SR Rao's research. That absurdly low count has been included solely to ridicule the Indus script adherents. Further, FSW has excluded all scholars that link Indus script with Sanskrit or Vedic languages – notably, Rajaram, Jha and Kalyanaraman. If FSW is unbiased, it should have included the count from the proponents of an Aryan decipherment.

Wells (1998) outlined clearly and scientifically, why he disagrees with Mahadevan/Parpola over the grouping and merging of potentially different signs. According to him, normalization of the script elements results in loss of meaning or distortion. While FSW takes an equally dim view of normalization (p45, fig12), FSW has not explained that as one of the main causes of deviation in sign counts between Wells and Mahadevan/Parpola.

If the sign count proposed by Wells - 586 - is accurate, the semantic range of the Indus script increases further.

10. FSW p22 footnote 6 : *the language codified in the Indus scripts cannot be Dravidian. Dravidian researchers rely on much later Tamil traditions, whose locus in historical times lay some two thousand kilometers from the Indus Valley.*

While it is debatable whether later Tamil traditions are being used by researchers, it is true that Tamil is being used by researchers. However, by pointing out that Tamilnadu is 2000 kilometers away from the Indus valley, FSW is trying to mock the scholars pursuing the Dravidian route, without discussing the fact that Tamil is a part of a large family of Dravidian Languages. FSW also fails to note that the footprint of Dravidian languages in current day India is considerable (Parpola 1994) - all of South India is Dravidian territory, small Dravidian clusters are in Central and North Eastern India, right in the middle of the Indus zone in modern day Pakistan, is another cluster (Brahui).

Witzel (1999) argued that Para Munda was the language spoken in the Indus region. Munda is an

Austro-asiatic language whose footprint in current day India is small (Parpola 1994). It is mostly centered in North Eastern India, with a small cluster in central India.

Dravidian population vastly out-numbers Munda speakers in modern India. More importantly, Munda speaking areas are as far away from the Indus Valley as the Dravidian language clusters in modern India (even after ignoring the Brahui cluster as an aberration) – a fact that has not been addressed by Witzel.

Witzel (1999) argues that loan words in the Rg Veda (RV) could provide important clues on the language spoken in the Indus region – Para Munda, according to him. He outlines the stratification of Rg Veda in the same paper:

I. The early Rgvedic period: c. 1700-1500 BCE, especially the hymns in books 4, 5, 6 (and maybe book 2);

II. the important middle Rgvedic period, c. 1500-1350 BCE: RV 3, 7, parts of 8.1-66 and 1.51-191;

III. the late Rgvedic period, c. 1350-1200 BCE: RV 8.67-103; 1.1-50; 10, 8.49-59.

According to Witzel (1999), no Dravidian loan words are found in the first strata.

We found 6 occurrences of the Dravidian word *Kuyava* (DEDR 1762, p160):

1. RV.I.103.8 : *Kuyava* – a demon of drought (Griffith)
2. RV.I.104.3 : *Kuyava* – a non-Aryan chieftain (Griffith). Sayana mentions a legend about an asura (demon) *Kuyava*'s two wives.
3. RV.I.174.7: *Kuyavac* – probably a name of a demon or barbarian (Macdonald & Keith, Vedic Index of Names and Subjects, Motilal Banarsidas, 1995)
4. RV.IV.18.8 – *Kusavaa* : a feminine noun *Rakshasi* (she-demon) according to Sayana or a name of river (Roth)
5. RV.VII.19.2 – *Kuyava* – same as 1 above.
6. RV.II.1.104.3 – *Kuyava* – reference to *Kuyava*'s wives (Griffith)

Therefore, atleast one Dravidian loan word is present in the first strata of RV disproving Witzel's conclusion. As shown above, *Kuyavan* is used as a name of a *dasa/dasyu* (the term used by Aryans to denote the local people) that was conquered by Indra. *Kuyavan* is not a name, but a profession - potter, a very important profession in the Indus region. This means that Dravidian speakers were in the Indus region around 1700 BCE.

2.2 Arguments considering Indus as a logo-syllabic or syllabic script

1. FSW p21 footnote 5 : *positional regularities of the type seen by researchers do not fit Indo-Aryan, Munda or Dravidian, which are the three candidate languages.*

Dravidian languages are suffixing and agglutinative. In an agglutinative language, the formation of compound words can simulate the appearance of in-fixing or prefixing. This could give the appearance of positional regularities.

For example, the Tamil word *naal* ('day') can be affixed with *tiru* ('auspicious' or 'holy') to yield the word *tiru naal* ('festival day'). Likewise, the word *makal* ('daughter') can be affixed with *tiru* to yield *tiru makal* ('auspicious woman'). Though *tiru* plays the role of a prefix, the grammatical construct in action is compounding. Similarly, in the compound word *maankaai saatam* ('raw mango rice') = *maa* ('mango') + *kaai* ('raw') + *saatam* ('rice'), *kaai* acts like an infix.

The authors' lack of knowledge in Dravidian languages might have led them to make this erroneous statement - Witzel (1999) states explicitly that he does not have knowledge of Dravidian. Dravidian expertise is not to be found in Farmer's and Sproat's resumes.

2. FSW p22 : *the Average sign length is 4.6 symbols, which shows extreme brevity and an absence of long texts.*

Phonetic scripts need many symbols to convey even simple messages. Whereas, a logo-syllabic script, can depict speech with a very small number of signs. To write a typical Dravidian invocation for divine protection - *murukan tunai* ('Murukan's protection'), 6 symbols are needed in modern Tamil. According to Mahadevan and Parpola, Indus Script has a single sign for *muruku*. This brings down the number of symbols needed for *murukan tunai* to 2 or utmost 3.

FSW notes that the size of the text encoded in the seals increased in later periods. But, that does not change FSW's stance that the symbols are not writing.

Wells (1998) proposed that some of the seals were strung together on a string to form longer texts, based on the fact that the seals have a perforate boss on one side. Though this idea has not been widely accepted, it is worth reconsidering. Beads and bead necklaces were a key product of the Indus civilization. It is possible that a similar technique was applied to string seals together to form long texts. FSW does not discuss this possibility, even though FSW has analyzed (and rejected) other points made by Wells.

3. FSW p31-33 : *there are no random looking sign repetitions within an inscription. Even when such repetitions were found, they were not numerous enough or the repetitions showed strange symmetry. Ligaturing does not explain this problem. The comparison with Egyptian cartouches also proves that this is a problem.*

The series of fishes in M-314 (*Indus Seals & Inscriptions*) have the same base symbol, modified through ligature marks. FSW proposes that the ligature marks altered the meaning - not the

sound. In a logo-syllabic script, it is reasonable to assume that ligature marks prefixed or suffixed a base word.

Some inscriptions have repeating symbols, where variants of the symbol are not used. Parpola has already proposed that when two ‘Eye’ symbols were repeated, the second symbol could be a ligatured version: *kan + kaani = kan kaani* (‘Supervisor’) (Parpola 2005).

Many inscriptions have a repeating pattern of the ‘pot’ symbol. According to Parpola, this might simply mean ‘many pots’. This kind of repetition called *atukku totar* is common in Dravidian languages. *atukku totar* means a string of the same word. The closest term in English is tautology. Examples in Tamil are *kulay kulayay* (‘many bunches’), *saari saariyay* (‘many rows’) and *ani aniyay* (‘many groups’). Onomatopoeic repetitions called *irattai kilavi* (literally, ‘double words’) is another common feature of Dravidian languages.

In a syllabic or alphabetic script, random repetitions of symbols is mandatory, since vowels and other often used letters repeat themselves in any reasonably long inscription. In a logo-syllabary, where signs stand for a syllable or a whole word, random repetitions are not necessary. The average sign length is 4.6 in Indus inscriptions. This means that very few symbols were needed to communicate a message. Hence, one cannot expect random sign repetitions within such small inscriptions.

It should be noted that FSW did find several random sign repetitions in Indus inscriptions.

Further, Wells (1998) proposed that some of the singletons could be homophones. In that case, the presence of multiple singletons in the same inscription could also be another evidence of random repetitions.

FSW compares Egyptian cartouches with the Indus inscriptions. Cartouches contain the names of the kings, while most Indus script scholars state that the Indus inscriptions covered religious symbols, rituals, agriculture and trade practices. Cartouches can only be compared with inscriptions if they codified names. Otherwise, it will not yield meaningful results.

2.3 Arguments considering Indus as a logo-graphic script

1. FSW p33 : If Indus civilization had a script, the semantic range of that “language” would be lower than that of a three year old child or a trained chimpanzee in a laboratory.

FSW has used Chinese as a reference civilization. Even though the full list of Chinese characters is over 50,000, a 3,000 character vocabulary is enough for day to day communication. If a modern, complex society like Chinese needs only 3,000 characters, it is conceivable that a Bronze age culture like the Indus civilization needed only 417 symbols (Mahadevan Concordance) or 586 (Wells Classification). Many reputed scholars believe that the Indus script was mainly used to depict their religion, religious rituals, agricultural and trade practices. For such a narrow subject matter, 417 or 586 symbols may provide enough semantic range.

Japanese, another logo-graphic script, uses just 1,945 characters (An additional 983 characters

are needed for names). This is an example of another complex, modern society that needs just 3,000 characters in its script.

To settle this dispute scientifically, FSW should have computed the subset of Chinese or Japanese symbols needed to codify the semantic range of the Indus inscriptions. Only then would we have an equitable comparison.

Harappans may not have used a logo-graphic script, but it is incorrect to compare the Indus sign counts with the full character set of Chinese. Conclusions on the semantic range of the Indus script borne out of this comparison would be questionable at best.

Punning is a common feature of Dravidian languages and this could also have extended the semantic range. This could manifest itself in the inscriptions as sign repetition. Such repetitions have been observed by FSW, but according to FSW (p34, line 9), such repetitions are not enough. FSW provides no empirical rules that mandate the number of sign repetitions in a logo-syllabary for it to be considered a script that encodes speech. Therefore, it would be inappropriate to dismiss such sign repetitions. In addition, as pointed out already in Section 2.2, it is incorrect to expect random sign repetitions in a script with average inscription size of 4.6 signs.

2.4 Arguments considering Indus as a non-script

1. FSW p36: there are too many singletons. And the number of singletons seems to increase with each new find.

In reality, singletons make up a very small proportion of the total number of sign occurrences. In the preceding sections, it was proved that signs with zero to nine occurrences form only 5.76% of the total. That weakens FSW's argument about "too many singletons".

FSW claims that (p36) "Signs keep cropping up with each new batch of discoveries...percentages appear to be rising instead over time, suggesting that at least some Indus symbols were invented 'on the fly' only to be abandoned after being used once". In yet another section, they claim that Indus script could not be logo-graphic because there are not enough symbols. FSW argues every which way with the same evidence.

FSW also claims that (p43) "The same evidence suggests that some Indus symbols may have been copied for centuries and in later eras combined out of deference for their antiquity or magical power...why the longest inscriptions show up in later periods...". If the symbols were copied out of deference, why would the singletons increase with additional discoveries? That would mean that more singletons were created in later periods. Instead, if what FSW proposes is true, the concordance of the discovered singletons should increase in later periods.

2. FSW p40: *Indus symbols are similar to West Asian religious symbols and Vinca symbols.*

The Vinca emblems weren't written on a straight line like Indus inscriptions. Most scripts are written in a straight line or in columns to this day. Also, 85% of Vinca inscriptions used just one sign – Indus inscriptions used an average of 4.6 signs per inscription (Indopedia 2008).

West Asian emblems denote gods, stars, months, clans and cities. There was an order to the emblems, which represented the pecking order of the gods. The emblems had great plasticity - they morphed to indicate other gods over a period of time (FSW p40). According to FSW, Indus inscriptions were similar emblems.

But, the West Asian sample quoted (FSW p40 figure 9) by them has emblems from a culture, who also have a script written in a linear fashion. This is a flawed comparison. It only furthers the argument that Indus is a writing system because it has similarities to another writing system. A Kudurru stone (FSW p41 figure 10 & 11) has been cited as another potential match. However, Kudurrus had symbols as well as linear cuneiform writing (FSW p41 fig 11). Another flawed comparison.

3. FSW p 19, foot note 2 : *Indus could not have encoded formal mnemonic systems (like Mexican-style picture writing, Incan Khipu, Iroquois Wampum or early accounting scripts) because of its extreme brevity.*

First of all, Khipu is yet to be fully deciphered. Next, it is a system of knots and didn't have symbols as in the Indus seals. It is a flawed comparison.

4. FSW p47: *a script is not a requirement of advanced civilizations. Incas, Aztecs though advanced didn't have a script. Mayas developed a script much later in their civilization.*

Incas and Aztecs post date Indus by several thousand years. FSW should have used an agrarian, trading, urban civilization (with advanced town planning, covered sewer systems, citadels etc) from the Bronze Age that did not have a script, to drive home their point.

5. FSW p35 : *the odd symmetries in the seals are not present in any other script.*

“odd” symmetries in M373 and H598 is FSW's opinion being stated as a fact.

There is indirect evidence (Parpola 2005) that the Indus script was transmitted over a wide geographical area. Similar inscriptions have been unearthed from 9 different cities over a vast geographical area. Evidence also shows that these are independent creations and not direct copies. A simple explanation for this is that the Indus script encoded a language.

According to FSW (p43), the seals were emblems used to derive power from the magical godly symbols, with "little understanding of the original sense". There is no basis for this conclusion either.

6. *FSW p36: singletons are too abstract to convey meaning.*

FSW compares the Indus symbols to 'Food and Fuel' pictograms on the US inter-state highways. But, pictograms would be useless, if they are too abstract to convey meaning. If seal makers routinely made cryptic pictograms, used them a few times and abandoned them, the intended audience would not comprehend their meaning.

In any case, many singletons are straight-forward. These depict gharials, crabs, fishes, anthropomorphic figures, pots, agricultural implements, geometric figures etc.

A more rigorous approach would be to classify the singletons into abstract or concrete, and compare the count of both categories. FSW has not done that.

7. *FSW p45: in a giant multi-linguistic society non-linguistic signs may have been more useful.*

According to FSW, Indus inscriptions are non-linguistic because people speaking many different languages lived in that region. One need not assume that ancient societies would have avoided writing, because the society was multi-ethnic or multi-lingual. For example, in Mesopotamia, Sumerians and Akkadians co-existed and both used the same cuneiform script to write (Frymer-Kensky 1992).

Modern countries such as the USA also have multiple ethnic groups, speaking different languages. While pictograms are used to communicate non-linguistically, there are also many signs in the dominant language - English. Some signs are in Spanish, the second most prominent language. Just as English in the USA and in computer communication around the world, the Indus civilization could have had a common lingua franca, with different dialects or languages in different regions. Indus script would then encode the lingua franca.

8. *FSW p42 : if numbers were depicted, they are presented in strange combinations.*

Even if an inscription conveys detailed accounting information such as 'X number of Y commodities', that is deemed to be a script. FSW quote K-49, a seal where "3" and "7" are depicted as tally marks. But there is no clear specification on what the commodity is. But K-59 denotes a number and a shield-like symbol. Many possible explanations could be entertained for this seal. This could be an order for a certain number of shields or amulets. Or, an order for a certain number of security guards to be stationed near the city gates. K-59 is simply one of the many inscriptions that counter FSW's theory about numbers.

9. *FSW p44 : one can identify shamanic symbols, shamanic elite and human sacrifice in the seals.*

FSW states that "One possibility consistent with all known evidence is that the oddly shamanic-looking elites often seen on mass-produced ritual inscriptions opposed writing due to the threats it posed to whatever control the symbols gave them over Indus populations". Writing as a means of control is a debatable point. Ancient Egyptians, for example, had a script. This did not diminish the control that the priests had over the people.

The evidence provided by FSW to support human sacrifice is from M.S. Vats' 1929 excavation, where 20 skulls tightly packed together with no other human bones were found. Is human sacrifice the only explanation for this find? Vats' chronology is not considered reliable (Kenoyer 1991). Ergo, FSW cannot state with certainty that the skulls belonged to the Indus civilization layer.

10. FSW p19 : since the time first seal was discovered in 1872-3, 130 years have elapsed without any meaningful progress on the deciphering.

Only one seal was discovered in 1872-3. The first major excavations started in the 1920s. Assuming that the earliest deciphering attempts started in the 1920s, the community has spent only 84 years as of 2004, the year FSW was published.

At any rate, this is a misleading argument. The first major decipherment claim for the Egyptian hieroglyphics was in the 5th century CE by Horapollo (Wikipedia Hieroglyphics 2008). The actual decipherment was completed by Champollion in the 1820s, a full 1,600 years since the first claim. If we calculate the 'decipherment time' as the number of years since the first hieroglyphic find, the Egyptian 'decipherment time' would be even longer.

84 years is less than 6% of the time spent on Egyptian hieroglyphic decipherment. From that perspective, it is clear that it is early days still on the Indus decipherment front.

3. Conclusion

All the arguments presented above show that FSW has not furnished any conclusive proof that the Indus civilization was an illiterate society. However, they have indeed raised some valid questions:

- a) The absence of long texts. There have been instances of script decipherment without any evidence of long texts, so that need not prevent constructive work done on Indus inscriptions.
- b) Lack of scribbled messages
- a) No writing on permanent materials like pillars etc.

4. Recommendations to the Indus civilization research community

The Indus research community is hopelessly fragmented. Without an unprecedented level of collaboration between the researchers, the deciphering of the script could be delayed indefinitely. To enable collaboration, a consensus should be reached quickly on the following:

- a) What is the true sign count of the Indus script?

- b) What type of script does Indus represent?
- c) What language does the script represent? In other words, what was the lingua franca of the Indus civilization?

A multi-disciplinary team which includes the following types of experts should be created: Dravidian (covering both literary and tribal languages), Vedic Sanskrit, Austro-Asiatic (Munda), food anthropologists, comparative religion experts specializing on the ancient world and geneticists/genography experts. Such a team will truly be a step in the right direction towards deciphering the Indus script.

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References Cited

Farmer, Steve, Richard Sproat, and Michael Witzel, 2004

The collapse of the Indus script thesis: The myth of a literate Harappan Civilization.
Electronic Journal of Vedic Studies 11 (2): 19–57

Farmer, S., 2004

Available at <http://www.safarmer.com/indus/Harvard2004.pdf> slide #27

Seen on April 14, 2008.

Farmer, S., 2004b

Mythological functions of Indus Inscriptions. Slide lecture given at the Sixth Harvard University Roundtable on the Ethnogenesis of South and Central Asia, May 2004.

Available from <http://www.safarmer.com/downloads> seen on April 14, 2008.

Frymer-Kensky, 1992

In the wake of the Goddesses. Ballantine Books. ISBN 0-449-90746-5.

Indopedia, 2008

http://www.indopedia.org/Vinca_alphabet.html Seen on October 10, 2008.

Kenoyer, J.M., 1991

Urban Process in the Indus Tradition: A Preliminary Model from Harappa

http://www.harappa.com/harappa_1986_1990/Harappa1986-90_04_Kenoyer-UrbanProcess.pdf .

Kochhar, R., 2000

The Vedic People : Their History and Geography/Rajesh Kochhar. 2000.
ISBN 81-250-1080-7.

Mahadevan, Iravatham, 1977

The Indus script: Texts, Concordance and Tables. (Memoirs of the Archaeological Survey of India, 77.) New Delhi: Archaeological Survey of India.

Parpola, A., 1994

Deciphering the Indus Script, Cambridge University Press, ISBN 0-521-79566-4

Parpola, A., 2005

A Study of the Indus Script. Available at

<http://www.harappa.com/script/induscript.pdf>

Parpola, A., 2007

Is the Indus Script indeed not a Writing system? Available at

<http://compling.ai.uiuc.edu/2007Workshop/Slides/parpola.ppt> Seen on April 14, 2008.

Vidale, M., 2009

The Collapse Melts Down, East and West, Volume 57, Page 333-366

- Wells, B., 1998
 An Introduction to Indus Writing, Thesis submitted to University of Calgary, Canada
<http://www.collectionscanada.gc.ca/obj/s4/f2/dsk2/ftp03/MQ31309.pdf><http://www.collectionscanada.gc.ca/obj/s4/f2/dsk2/ftp03/MQ31309.pdf> Seen on Apr 14, 2008.
- Wentian Li, 2008
 A collection of papers on Zipf Law and its applications available at
[http://www.nslj-genetics.org/wli/zipf/](http://www.nslj-genetics.org/wli/zipf)<http://www.nslj-genetics.org/wli/zipf/>
 Seen on April 14, 2008.
- Wikipedia Chinese, 2008
 Available at http://en.wikipedia.org/wiki/Chinese_character Seen on April 14, 2008.
- Wikipedia Cuneiform, 2008
http://en.wikipedia.org/wiki/Cuneiform_script Seen on April 14, 2008.
- Wikipedia Hieroglyphics, 2008
 Seen online on April 14, 2008 at
http://en.wikipedia.org/wiki/Egyptian_hieroglyphs#Decipherment_of_hieroglyphic_writing.
- Wikipedia Kangxi, 2008
 Available at http://en.wiktionary.org/wiki/Index:Chinese_radical Seen on April 14, 2008.
- Witzel, M., 1999
 Early Sources for South Asian Substrate Languages, Mother Tongue, October 1999 issue
- Witzel, M., 2005
 Archaeological Fantasies: How pseudoarchaeology misrepresents the past. ISBN 04-1530-592-6.
- Witzel, M. and S. Farmer, 2000
 Horseplay in Harappa: The Indus Valley Decipherment Hoax. Frontline 17(19):4-11.
 Available online at <http://www.safarmer.com/frontline/> Seen on April 14, 2008.
- Witzel, M., 2001
 Autochthonous Aryans? The Evidence from Old Indian and Iranian Texts.
 Available online at <http://www.people.fas.harvard.edu/~Ewitzel/EJVS-7-3.pdf>
 Seen on April 14, 2008.
- Witzel, M., 1999
 Early Sources for South Asian Substrate Languages, Mother Tongue Special Issue, Oct 1999. Seen online April 14, 2008 at
<http://www.people.fas.harvard.edu/~Ewitzel/MT-Substrates.pdf>
- Yadav, Nisha, MN Vahia, Iravatham Mahadevan, and H Joglekar, 2007
 A Statistical Approach for Pattern Search in Indus Writing. Seen online April 14, 2008 at <http://www.harappa.com/script/tata-writing/indus-script-paper.pdf>