

Towards further understanding of the Indus script

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Introduction

The¹ Indus script, with its 5000 inscriptions coming from more than fifty sites, stands out among the still undeciphered writing systems of the world. The Indus or Harappan Civilization flourished from 2500 to 1900 BC. More than a thousand settlements have been identified in Pakistan and northwestern India, but Harappan merchants also sailed to the Gulf and Mesopotamia. The Indus Civilization collapsed and vanished many centuries before literary sources composed in Vedic Sanskrit start the historical period in South Asia around 1000 BC. There are scanty references in cuneiform texts to a far-off country called Meluhha from where ships sailed to Mesopotamia bringing exotic goods. Otherwise no readable historical information about the Indus Civilization is available, nor do we have any bilingual inscription translating or transcribing an Indus text into a known language or script. For these reasons, decipherment of the Indus script has remained a highly challenging task.

¹ Together with the paper read at the symposium “On Invention of Writing and Its Relevance to Civilization” at the Seoul National University on the 7-8 October 2008, this is largely a revised version of my so far unpublished Hermann Collitz Lecture ‘*Fish*’, ‘*Crab*’, and ‘*Fig*’: *Can we make sense of the Indus pictograms?* at the LSA's Linguistic Institute 2007 at Stanford University, 17 July 2007. Most of the material can be found in my book *Deciphering the Indus script* (Cambridge 1994) (earlier summaries in Parpola 1975; 1997; 2005). The focus is on the methods and conclusions, on interpreting a few Indus pictograms, and especially on ways to check these interpretations. Indus texts are cited after CISI.

In my book *Deciphering the Indus Script* (1994), I have proposed specific Proto-Dravidian readings for two dozen Indus signs, and checked these interpretations in various ways. The main methods and some results were presented at the Seoul National University's Institute of Humanities during its symposium "On Invention of Writing and Its Relevance to Civilization" on 7-8 October 2008. As an introduction, I repeat here just the most important points.

In the decipherment of any ancient script, there are two principal unknowns to be clarified at the outset, namely the script type and the underlying language or languages. The Indus script with its 400 graphemes is a logo-syllabic writing system, the oldest script type and the only one known to have existed anywhere in 2500 BC. Each pictographic sign can denote either the thing depicted or (as a rebus) the phonetic sound that its appellation had in the underlying language. Basic signs can be combined to express compound words or to add silent semantic or phonetic indicators. In the Indus Civilization, only one language was written. Historically, it is most likely that that language was Proto-Dravidian. The Vedic texts composed in Old Indo-Aryan language in the Indus Valley around 1000 BC have Dravidian loanwords. Today, most Dravidian languages are spoken in South and Central India, but one called Brahui has been spoken in Baluchistan in the northwest for as long as the historical sources go. Tamil in the far south has a 2000 years old literature.

Individual signs of an unknown logo-syllabic script may be deciphered if four conditions can simultaneously be fulfilled: (1) the object depicted in a given pictogram can be recognized; (2) the said pictogram has been used as a rebus; (3) the intended rebus meaning can be deduced from the context(s); and (4) homophonous words corresponding to the pictorial and rebus meanings exist in a historically likely known language. The starting point for my interpretations was the very frequently used sign depicting 'fish' (in addition to 'plain fish', there are fish signs modified with various diacritics). In Proto-Dravidian, *mi:n* meant both 'fish' and 'star'. The meaning 'star' is more likely in seal texts, for the contemporary Mesopotamian seals mainly contain proper names and never speak of fish, while in India from Vedic times onwards persons have names derived from stars and planets. In this fashion, all hypotheses for readings must be checked against script-external evidence. Do the proposed interpretations make sense in the Harappan context, and with regard to the later South Asian tradition, and the Mesopotamian contacts? The hypotheses are to be subjected also to script-Internal checking in the manner of cross-word puzzles. If we apply exactly the same assumptions and methods of interpretation to signs associated with an interpreted sign in a compound sign or in a recurring sign sequence, do we get sensible results? If yes, further external

checking must be done: are the posited compound words actually attested in Dravidian languages and not mere imagination? Particularly important is Old Tamil literature, the only ancient Dravidian source not much contaminated by Indo-Aryan languages and traditions.

The Indus sign sequences consisting of 'six' (six short vertical strokes) + 'plain fish' and 'seven' (seven short vertical strokes) + 'plain fish' correspond to the names of the Pleiades (with six stars) and the Ursa Major or Big Dipper (with seven stars) in Old Tamil texts. The Pleiades started the Vedic list of calendrical asterisms, as their conjunction with the sun at the vernal equinox marked the beginning of the new year. This conjunction took place during the second half of the third millennium, precisely when the Indus civilization, like all urban cultures based on agriculture, needed a solar calendar. In Vedic and Hindu mythology, the six Pleiades are the wives of the Seven Sages, the ancestors of the priestly families identified with the stars of Ursa Major. The Pleiades were rejected by their husbands, because they had intercourse with the Fire God or God S'iva, their present lover, represented by the vernal sun. Only one wife, Arundhati:, could not be seduced, and she was allowed to remain with her husband in the northern sky.

This paper will first retrace the steps taken to extend these initial hypotheses. Systematic application of the same methods and rules has produced a web of interpretations, which are cross-checked both internally within the Indus texts and externally against the Dravidian languages and texts. I feel fairly secure with these interpretations, because they in addition agree with Harappan art and iconography and not only cluster around some central and rather archaic concepts of early Indian religions but also help in understanding how those conceptions have arisen.

I originally thought of presenting at this symposium many ideas of how this limited decipherment might be carried still further, but realized that they would not be very interesting or indeed understandable for an audience unacquainted with my previous work. I still think it will be instructive to give, at the end of the paper, a few examples of how I have been groping with the problems of the Indus script for decades. I have not published these thoughts before on account of their very tentative nature. Their purpose is to illustrate not only how one might progress in this decipherment but also the difficulties one encounters on this path. Hopefully this will inspire other scholars better equipped to the task to find more definitive solutions to these and many other problems.

But first I present published interpretations that are methodically most significant.

The banyan fig and the pole star

One recurring sign sequence which has the plain 'fish' sign as its latter member begins with a sign whose iconic meaning seems to be 'fig tree'. The question is, can we here too have a Dravidian astral term?

The iconic interpretation as 'fig' is based on a comparison with Harappan painted pottery. The fig tree is shown as three-branched, just as on the painted pottery, except when another sign is placed inside it; then the central 'branch' is omitted. In the combined sign, the branches end in fig leaves as they do on the painted pottery, but in the basic sign with less space the fig leaves are simplified, and one or two down-going lines are sometimes added beneath the leaves on either side; in some variants three or four such lines replace the leaves altogether.

The 'three-branched fig tree' motif occurs on Harappan pottery from the Early through the Mature to the Late phase. In one variant from the time when the Indus script was created, four strokes are attached to either side of the middle stem. They are similar to the strokes of the Indus sign, except for their upward direction, which may be due to the direction of the two lower stems. The strokes seem to represent the air-roots of the banyan fig.

The rope-like air-roots are characteristic of the banyan fig, *Ficus bengalensis* or *Ficus indica*. This mighty tree is native to South Asia and does not grow in the parts where the Indo-Aryan speakers came from.

A post-Vedic Sanskrit name for the banyan fig is *vaTa*. This is a Dravidian loanword, ultimately derived from Proto-Dravidian *vaTam* meaning 'rope or cord'. As a name of the banyan fig, *vaTam* is short for the compound *vaTa-maram*, 'rope-tree', which is attested in Tamil. *VaTam* 'banyan' has a Proto-Dravidian homophone *vaTa* 'north' or 'northern'. This yields the expected astral meaning to the sign sequence 'fig' + 'fish'. *VaTa-mi:n* 'north star' is attested in Old Tamil as the name of the star Alcor (in the Big Dipper), called Arundati: in Sanskrit.

In Old Tamil texts, *vaTa-mi:n* is a symbol of marital fidelity, and this star is pointed out to the bride as an object of emulation during the wedding. Originally *vaTa-mi:n* probably denoted the pole star, which in the third millennium was the nearby star Thuban. The pole star is the 'immobile' centre of the rotating heavens, and called in Sanskrit *dhruva*, 'fixed, firm, immovable, constant'. It is a fitting symbol of firm fidelity, and indeed in Vedic marriage ritual the pole star is pointed out to the bride as a model in addition to Arundhati:.

This interpretation explains in a new way some peculiar cosmological conceptions. In the first place, the Sanskrit texts mention the banyan fig as the tree of the northern direction. Homonymy connects the banyan fig with the north in

Dravidian, but there is no such linguistic association in Indo-Aryan languages. Secondly, in reply to the question, why do the stars and planets not fall down from the sky, the texts say that the heavenly bodies are bound to the pole star with invisible 'ropes of wind'. In Dravidian *VaTa-mi:n* as the name of the pole star also means 'rope-star' and 'banyan-star'. Around 1000 BC, a late hymn of the Rgveda (1,24,7) speaks of the roots of a cosmic banyan tree being held up in the sky by God VaruNa.

The Vedic and Hindu texts repeatedly refer to heavenly fig tree. This conception seems to be reflected on an Indus tablet, which depicts an anthropomorphic deity inside a fig tree. At bottom the fig tree is flanked on either side by a star. They suggest a heavenly connection for the tree.

The 'crab' sign

The interpretation of the 'fig' sign can be further checked by attempting to understand the compound sign where a crab-looking sign has been inserted in the middle of the 'fig' sign. Here the 'crab' sign is depicted both with feet and without feet.

That the sign where the crab has feet is an allograph of those where the crab is without feet can be seen from the similarity of the context in two Indus seals (H-589 and L-11). On both seals the compound sign is followed by the same two other signs.

The 'crab' sign occurs more than 150 times as a separate grapheme. With feet added, it clearly depicts the 'crab', but mostly the sign is simplified to a round body with claws. The emphasis laid on the claws suggests that the sign expresses 'grasping' or 'seizing', which is consistently associated with the crab in Indian folklore. Thus in the Buddhist *Baka-Ja:taka*, a crab says to a heron that has promised to carry it away from a dried-up pond: "'You'd never be able to hold me tight enough, friend heron; whereas we crabs have got an astonishingly tight grip.' Then the crab gripped hold of the heron's neck with its claws, as with the pincers of a smith." (Transl. R. Chalmers, in Cowell 1895: I, 97.)

Crab's claws are compared with the smith's pincers also in Old Tamil texts, where the root *koL* 'to grab, seize, take' is used of the crab's 'seizing'. Indo-Aryan texts use the synonymous Sanskrit root *grah-* or *grabh-*, which is related to English *grab*. The 'crab' sign often occurs close to the 'fish' signs and might therefore have an astral meaning. Proto-Dravidian *ko:L* 'seizure' also means 'planet' in Tamil. Sanskrit *graha* has exactly the same meanings, 'seizure' as well as 'planet'. Other Indo-European languages do not have a noun meaning 'planet' derived from the

cognates of the root *grah-*. Sanskrit *graha* is therefore more likely to be a loan translation from Dravidian than *ko:L* is to be a calque on Sanskrit *graha*. In the oldest Tamil and Sanskrit texts *ko:L* and *graha* refer to the invisible heavenly demon that causes eclipses.

Instead of *ko:L* ‘planet’ or ‘eclipse demon’, a synonymous compound, *ko:L-mi:n* ‘seizing star’, is used in several Old Tamil texts. Not only does the corresponding sign sequence ‘crab’ + ‘fish’ occur three times in the Indus inscriptions, but the identity of the subsequent part in two parallel inscriptions (M-387 and M-57) suggests that this sequence, ‘crab’ + ‘fish’, is synonymous with the plain ‘crab’ sign, as is Tamil *ko:L* with *ko:L-mi:n*.

The planets are firmly believed to ‘seize’ people and afflict them with ills. DaNDin around AD 700 speaks of the ‘terrifying stars and planets’, which the sorcerers control with magical diagrams. From the 18th century we have a graphic description of such incantations: “The term *graha*, by which they are designated, signifies the act of seizing, that is, of laying hold of those whom they are enjoined by the magical enchantments to torment..... The magician ... exclaims as though in a vehement rage, ‘Grasp it! Grasp it!’ ... No sooner is this done than the *grahas* or planets take possession of the person against whom such incantations are directed, and afflict him with a thousand ills.” (Dubois 1906: 387ff.)

The compound sign ‘crab inside fig’

We can check the interpretation of both the ‘crab’ and ‘fig’ signs by examining the compound sign where the ‘crab’ has been placed inside the ‘fig’. Luckily, this compound sign is among those few Indus signs for which the copper tablets provide ‘pictorial bilinguals’, mediating their intended meaning visually, through an iconographic image.

The 240 copper tablets from Mohenjo-daro constitute a rare category of objects in this respect that there is a clear interdependence between the inscription on the obverse and the iconographic motif on the reverse. The numerous duplicates form sets of identical tablets. In some sets, a single sign on the reverse has the same inscription on the obverse as the obverse of another set where the reverse shows an animal or human figure. It appears as if the single sign stood for the name of the divinity illustrated in the corresponding animal- or human-shaped image.

The ‘crab inside fig’ sign can thus be equated with a male figure armed with bow and arrows, anthropomorphic apart from horns and tail, and with long eyes.

In Near Eastern and Chinese scripts, an inserted sign often functions as a semantic or phonetic determinative. The ‘crab’ sign could indicate that here the

'fig' sign is not to be read with its usual phonetic value as *vaTam* 'banyan tree'. The meaning 'fig' is retained, but the phonetic shape of the word is similar to that expressed by the 'crab' sign, i.e. *ko:L*. Proto-South-Dravidian possesses exactly such a word: *ko:Li*. This word denotes a fig tree, on the one hand as a grasping epiphytic plant that strangles its host tree, and on the other hand, as a plant which bears fruit without blossoming. In this latter sense *ko:Li* is related to Old Tamil *ko:L* which denotes 'the act of bearing fruit'. Both are derived from the root *koL* 'to take'. Sanskrit *grabh-* has the same additional sense of 'bearing fruit'.

But how can this word *ko:Li* be connected with the Harappan archer-god depicted on the copper tablets? In early Vedic texts the grasping fig strangling its host tree and breaking buildings is implored for help in crushing enemies. It is a fitting symbol for the god Rudra, who is described as a cruel hunter and raider. With his bow, Rudra shoots arrows at animals and people. He is also called in Sanskrit *Hara* 'seizer, taker, robber', which could reflect the Dravidian word *ko:L* 'seizure, plunder, robbery'. There is also a homonym *ko:L* 'hitting, killing', from the root *koL* 'hit, shoot with bow, kill'. The compound sign seems to express even iconically this ambivalent deity who both 'seizes' or 'kills' and 'bears fruit' or 'fructifies', for the crab sign is placed inside the fig sign, just as anthropomorphic deities are placed inside fig trees in Indus glyptics.

Yet another significant homophone is *koLLi* 'firebrand, fire, glowing ember'. Rudra is in Vedic texts constantly said to be the same as the Fire god Agni, and his Hindu successor, the War god Skanda, is the overlord of the red planet Mars, called in Sanskrit *Rudhira* 'red, bloody' and *Anga:ra* 'coal, glowing ember'.

The ram- or goat-faced fertility god and the fig tree

On one tablet from Harappa (H-178), we see a ram-headed but otherwise anthropomorphic deity inside a fig tree. The god's arms are full of bangles and in their great length these arms resemble the hanging air roots of the banyan.

The Harappan ram-headed fig-deity has an obscure and little known successor in later Indian tradition. On a second century relief from Mathura, the goat- or ram-headed fertility god *NaigameSa* is flanked by a baby boy and three women. With the three women broken off from the other side, the six women are likely to represent the six Pleiades as mother goddesses.

In an early Vedic prayer the ram-deity *NejameSa* is asked to bring the embryo of a beautiful male child. The prayer is to be muttered by a woman who does not conceive, or by the husband at the first intercourse. In the Vedic wedding rite, the newly married couple may not have intercourse during the first three nights.

During those three nights, a fig stick is placed between the spouses, symbolizing a fertility deity, who is the bride's divine husband and seminator.

The Sanskrit medical texts prescribe bathing the new-born baby under the banyan-tree, if its disease is diagnosed as caused by Naiga-meSa, together with a bloody offering to this deity at banyan figs on the sixth day from birth. The god is said to have a goat's face and to have fathered the baby.

In the Vedic ritual called 'engendering male offspring', the wife wears a phallic amulet made of the shoot of a banyan-fig. It should have two fruits symbolizing testicles. The shoot is to be cut from the king of banyan figs that grows outside the village after propitiating the deity who inhabits it.

The Vedic fire-god Agni, who is said to be the mate or son of the Pleiades, has Indo-European ancestry, but has absorbed attributes and myths likely to have local Indian origin as they are connected with local plants and animals. Thus the upright kindling stick of sacred fire is taken of the pipal-fig or *Ficus religiosa* with flame-shaped leaves. The churning of fire has sexual symbolism and the upright stick represents the male organ. Agni is called the "embryo of forest-trees" and as such prayed to place an embryo in the womb.

According to the Kalpasu:tra of the Jains, the ram-faced God Hari-NaigameSin is the leader of the divine army with the peacock as his mount, thus clearly a double of the Hindu war-god Skanda who rides the peacock. Hari-NaigameSin transfers the embryo of Maha:vi:ra Jina to the womb of his mother.

Ancient Indian medical texts have an unusually primitive section on the illnesses of new-born babies, where the term nava-graha denotes a group of malignant demons keen to attack and seize the infants, if proper respect is not shown to them and the rules of cleanliness and nursing are not followed. If worshipped, they protect the child and the mother. The lord of these demons is Skanda-Graha. The group also comprises two of his multiforms including the goat-headed NaigameSa and six goddesses. These nine demons were created by the Fire God Agni and S'iva along with the six Pleiades so that they would protect the new-born god Skanda.

The best known version of the Pleiades myth relates the birth of the ever youthful war-god Skanda. The God of Love shot his arrows of desire at S'iva, whose seed "leapt" (*ca-skanda*) and fell into the river Ganges. The wives of the Seven Sages were bathing in this heavenly river, and became either the mothers or the nurses of this instantly born beautiful boy, who rides a peacock.

The ancient Tamil counterpart of Rudra and Skanda, Muruku, and his identification in the Indus texts

Skanda has a counterpart in the principal native deity of Dravidian South India, the youthful god of war, wisdom and fertility, Murukan, whom the Tamils today worship as their “national god”. Common people pray Murukan for sons. His mount is the peacock and his weapon the spear.

In Old Tamil literature Murukan is the hunter god of hill forests, much like the Vedic Rudra. He is also the god of love and fertility. From AD 300 Murukan is explicitly amalgamated with Skanda.

Murukan’s name or names are likely to occur in Indus texts. But how to locate them? Skanda’s association with the Pleiades can be used as a clue, because the Pleiades can be identified as the sign sequence ‘6’ + ‘fish’. This sequence occurs on a seal, where the first three signs all occur in the same sequence as on another seal but nowhere else. The immediately following sequence in this second seal, comprising the signs ‘intersecting circles’ + ‘two long vertical strokes’, could be a name of Murukan. It occurs very frequently in Indus inscriptions.

Some contexts strongly suggest that this sign sequence refers to a deity. Complemented by the regular text-final sign it forms the sole text on both sides of one unusual tablet.

The same sequence concludes the inscription on an amulet whose reverse shows a god sitting on a throne, flanked by a kneeling worshipper and a snake on either side. In South India, Murukan is associated with phallic snake cult, and his peacock feeds on snakes.

If the ‘intersecting circles’ express Murukan’s name or the first part of it, the first choice is the god’s principal name, the Proto-Dravidian word *muruku*, which means ‘young man’ or ‘baby boy’. This name is a synonym of Sanskrit kuma:ra, ‘youth’ and ‘baby boy’, one of the names of Skanda and Rudra. Muruku has an exact and ancient homonym, whose meaning fits the shape of the pictogram, namely *muruku*, ‘ring, ear-ring, bangle’.

This interpretation is supported by the sign’s formal identity with the symbol for royal ear-rings in the art of Tibetan Buddhism.

In Gisèle Krauskopff’s drawing that illustrates her field research in Nepal, a pair of bangles offered to a spirit menacing children and pregnant women looks exactly like the Indus sign ‘intersecting circles’.

‘Arm-ring’ or ‘bangle’ is among the meanings of Dravidian *muruku*. This meaning for ‘intersecting circles’ is endorsed by the high frequency of this pictogram on the 40 or more inscribed ‘stoneware’ bangles. Several of these bangle

inscriptions contain nothing but this sign. It is not unusual for ancient inscriptions to mention the name of the object on which it was written, especially if it was given as a votive offering. These stoneware bangles were manufactured with a difficult process, and they must have been very expensive. On a votive bangle, the pictogram read as *muruku* could denote not only the 'bangle' offered but also the 'boy child' wished for by the donor, as well as the proper name of the child-granting divinity, himself the divine child par excellence. Even today many Tamil couples desiring a male child make a pilgrimage to a famous shrine of Murukan and, after the birth, name their son after the god.

The bangle has a strong association with pregnancy in many parts of India. During pregnancy and childbirth, the mother and baby are both in great danger of being attacked by demons, and the bangle symbolizes an enclosed circle of protection. In Tamil Nadu, the expectant mother is ritually adorned with bangles and blessed by older women in the seventh month of the first pregnancy.

Bangles and rings are also charms effecting reproduction. Composed around 1000 BC, an Atharvavedic hymn addresses *pari-hasta*, 'bracelet', literally 'what is around the arm'. The bracelet is fastened upon a woman 'intending that she shall beget a son'; this charm drives off the demons, opens up the womb and brings an embryo into it.

In Indian folk religion, Hindus and even Muslims offer pregnancy bangles to tree spirits. People anxious to have children hang as many bangles as they can afford on the branches of a sacred tree. If the tree spirit favours their wish, the tree "snatches up the bangles and wears them on its arms."

This widespread folk custom is likely to go back to Harappan traditions. The deity standing inside the fig tree on this Indus seal wears bangles on both arms. The seven anthropomorphic figures at the bottom of one seal, wearing their hair in the traditional fashion of Indian women, are likely to be female and to represent the 'Seven Mothers', the Wives of the Seven Sages, famous as child-granting and child-killing goddesses like their son Skanda.

That the stripes on the fig deity's arms depict bangles is supported by a bronze image whose entire left arm is covered by bangles.

Cross-checking the Muruku interpretation:

(1) 'the two long vertical strokes'

The reading *muruku* for 'intersecting circles' could be verified by means of the sign frequently POSTFIXED to it, that is, one consisting of 'two long vertical

strokes'. Actually this sign makes a triple cross-check possible, for it often PRECEDES the 'plain fish' sign. What is its iconic meaning? Such a simplified symbol lends itself to various interpretations, and it would be difficult to decide which of them, if any, is correct. But our tentative readings enable a different approach. We can collect all actually attested Old Tamil compounds which start with the word *muruku* on the one hand, and all which end in *mi:n* on the other. If these two very limited lists turn out to contain one and the same word among the candidates for the missing component, the solution thus found can be further tested by asking whether its meaning adequately explains the pictorial shape 'two long vertical strokes'.

Among the few Old Tamil compound names of Murukan is *Muruka-Ve:L*. *Ve:L* means 'love, desire' and is used even alone as a name of Murukan. From Murukan's name we turn to astronomical terms. Old Tamil *veL-mi:n* denotes the planet Venus, the brightest star of the sky. The first component *veL* means 'white or bright'. Its derivative *veLLi* denotes 'Venus' in several Dravidian languages, in Tamil also compounded with *mi:n*. The shared component of the two compounds thus has the phonetic shape *veL* or *ve:L*. Its homophone *veL* or *veLi*, denotes 'space (in general)' and 'space between for instance furrows'. This matches well the shape of the sign 'two long vertical strokes'.

The sign 'two long vertical strokes' is used in the Indus script not only as an *ATTRIBUTE* of the 'fish' pictogram, namely in the compound read as *veL + mi:n* 'bright star, Venus', but also as a *SYNONYM* of the 'fish' sign. The synonymous usage can be seen by comparing two inscriptions which otherwise share the same four-sign long sequence, though three of the graphemes have variant forms. The 'fish' sign is here preceded by the 'fig' sign, yielding the compound *vaTa-mi:n* 'north star'. This interesting case passes the test well, for the word *veLLi* denotes besides 'Venus' also 'star (in general)'.

Two Tamil dictionary renderings for English 'star' are *viN-mi:n* and *va:n-veLLi*. The words *viN* and *va:n* both mean 'sky'; they have been prefixed to avoid confusion with the homonym *mi:n* 'fish'. The synonymous use of *mi:n* and *veLLi* is attested also in Tamil compounds *viTi-mi:n* and *viTi-veLLi*, both meaning 'the star of the dawn'.

(2) *The 'squirrel' sign*

Finally the interpretation of a sign which has a very narrow pictorial meaning. From distinctly carved occurrences, this sign can be recognized as depicting the palm squirrel in its typical pose, head downwards and tail up with four legs on

vertical tree trunk. The palm squirrel can sleep for hours in this pose, which has given it its Sanskrit name 'tree-sleeper'. It lives all over the Indus Valley and is represented in tiny faience figurines at Mohenjo-daro.

The sign interpreted as *muruku* is twice followed by the 'palm squirrel' sign. Can this sequence too be read in Dravidian so that the resulting compound is among the attested composite names of God Murukan? One of the two inscriptions has nothing but this sequence followed by the sign read as *Ve:L* 'Desire', one of Murukan's names.

In Tamil, the palm squirrel is called *aNil* or *aNil piLLai*. *PiLLai* means 'child, infant, son, boy' as well as 'young of animals and trees'. In the case of the squirrel, parrot and mongoose, the word *piLLai* is added to the actual word for the animal in order to form an affectionate diminutive. The word *piLLai* can also alone refer to the animal concerned. This Tamil usage of *piLLai* in the meaning of 'squirrel' goes back to Proto-Dravidian, for Central Dravidian preserves cognates of *piLLai* meaning 'squirrel'. *PiLLai* is added also to the various names of the god Muruku to form affectionate variants that are popular as male proper names in Jaffna Tamil, and these names include *Muruka-p-piLLai*.

In honourific plural, *PiLLaiya:r* is the Tamil name of the popular god GaNes'a or GaNapati, whose Sanskrit name means 'Leader of the Host'. This god is an ancient double of Rudra and Skanda, the 'Leader of the divine Army'. GaNes'a is also a phallic deity followed by a host of Mother Goddesses. At least in South India his cult image is often placed under a fig tree.

New interpretations in the making

Thus there is a fair number of consistent rebus interpretations which interlock with each other and with external linguistic and cultural data. The readings moreover make good sense in the framework of ancient Indian cultural history and the Harappan context, and they keep within narrow limits: fertility cult connected with fig trees, a central Hindu myth associated with astronomy and time-reckoning, and chief deities of Hindu and Old Tamil religion. These interpretations and their wider contexts provide a lot of clues for progress, but our defective knowledge of Proto-Dravidian vocabulary, especially compounds, and the scarcity of ancient Dravidian texts (practically available in Old Tamil alone) severely limit the possibilities of effective checking. The following few examples connected with just a few signs aim at giving an idea of how I am endeavouring to enlarge this rather limited decipherment, and of the difficulties one is groping with.

Targeting the 'fish' compounds: the 'animal's hind leg' sign

The sign sequences ending in the plain 'fish' sign are an obvious first target, as they are likely to express Dravidian appellations of either fish species or, more probably, heavenly bodies. To assist their identification, I added to my book (Parpola 1994: 279-283), on the basis of an unpublished reverse index, an annotated 5-page list of all compounds ending in *mi:n* that are contained in the 7-volume *Tamil Lexicon*. Tamil has best preserved ancient Dravidian astronomical terms, which in most other Dravidian languages have been largely replaced by Indo-Aryan loanwords. As astronomical terms moreover are not the first target for linguists recording tribal languages, even the scarce remainder of native astronomical terms in Dravidian languages other than Tamil is very defectively recorded. One big obstacle in matching the Indus sequences with the Tamil compounds is that it is difficult to recognize the pictorial meaning of the Indus signs. The only one among the not yet interpreted signs preceding the plain 'fish' sign that can clearly be understood represents the hind leg of a bovine, sheep or goat. But there is no suitable match in the list of Tamil compound words ending in *mi:n*.

I have only very recently found a satisfactory solution to the 'hind leg' + 'fish' problem, published here for the first time. An important point to realize was that although this list contains all the compounds ending in *mi:n* that have been recorded in the *Tamil Lexicon*, it does not necessarily include all relevant compounds that have once existed. *Panai-mi:n* is recorded only as the name of two fish species, *Polyacanthus cupanus* and *Anabas scandens*. The first member of this compound, *panai*, has the basic meaning 'palmyra palm' (*Borassus flabellifer* Linn. = *Borassus flabelliformis* Murr.). But in addition to its basic meaning, the word *panai*, without the addition of the word *mi:n*, also means 'the fish *Polyacanthus cupanus*' as well as the calendrical asterism called *anura:dha:* in Sanskrit. Evidently the astral meaning too could have once been expressed with the compound *panai-mi:n*. Actually, this asterism has four other names in Tamil all meaning 'palmyra palm' (*ta:Li, pul, peNNai, po:ntai*) and in addition one meaning 'bent palmyra palm' (*muTa-p-panaiyam*). The tradition of conceiving this asterism as having the shape of a palmyra palm is of Dravidian origin, for it is totally independent of Indo-Aryan sources: according to Brahmanical texts, the constellation has the shape of an offering (*bali*) or an ornamental arch (*toraNa*) (cf. Kirfel 1920: 139) and according to Digambara and S'veta:mbara Jains, respectively, of a one-stringed pearl necklace (*eka:vali*) or pearl necklace (*ha:ra*) (cf. Kirfel 1920: 282). Obviously there can be other cases too, where the full name of the

asterism would end in *mi:n*, but the asterism is referred to by just the first member of the compound.

The Old Tamil poem in PuRana:nu:Ru 395 mentions the unfavourable position of a heavenly body called *ta:L*. According to the *Tamil Lexicon*, a comet is meant, but according to George Hart (1975: 73) *ta:L* is more likely to be “a constellation, since Eri evidently means comet in the same poem”; Svaminatha Aiyar in his edition glosses it just ‘star’ (*viNmi:n*). In Tamil the word *ta:L* has the meanings ‘leg, foot, foot of a tree or mountain, stem, pedicle, stalk’, but in the Toda language spoken in the Nilagiris, the cognate *to:L* is recorded in the specific meaning ‘thigh of animal’s hind leg’ (cf. DEDR 3185), which tallies rather well with the ‘hind leg’ sign of the Indus script we are discussing. The same can be said of the Sanskrit compound *aja:nghri-*, literally ‘goat’s foot’, which in some texts such as the VasiSTha-Smrti (32,204) denotes a calendrical asterism. In the Vedic texts this constellation is *pu:rve proSThapada:h* (cf. Kirfel 1920: 36), in later Brahmanical texts also *pu:rva-bha:drapada:h* (Kirfel 1920:139). The word *proSTha-* denotes a ‘cot’ or ‘bedstead’ (which agrees with the form the later Brahmanical texts ascribe to this asterism: *s'aya:*, *paryanka*, Kirfel 1920: 139), while the word *pada-* means ‘foot, leg’; according to the Digambara Jains, this asterism resembles the legs of an elephant (*gajapu:rva:paraga:tra*, *ibhaga:trasamcaya*, cf. Kirfel 1920: 281). Thus *ta:L* may well be the right reading for the ‘hind leg’ sign, but it must be tested against other contexts. One such context is the seal M-290, which is promising in this respect that here the ‘hind leg’ precedes a sign that can be pictorially recognized: it depicts an animal with large upright ears and an upright tail ending in a tuft of hair, either dog or wild ass. In South Asia, the latter animal exists only in Kutch and Baluchistan, and is hardly mentioned in any text, Indo-Aryan let alone Dravidian.

Attributes of the pole star / Alcor

(1) the ‘scorpion’

The sequences interpreted as the Proto-Dravidian names of the pole-star and the star Alcor provide a context that defines the likely intended meaning of two Indus signs. Both of these two signs occur as the first of the text in three separate inscriptions, immediately before the deciphered compound name of the star, apparently as its qualitative attribute. In the seal M-414, the attribute and the star name constitute the entire inscription. Here the first, probably attributive sign looks as if it represented the scorpion. It must be admitted that the nippers and pincers of

the first and second pairs of legs are curiously rendered, but the sting is clear and invariably present in all variants (cf. Parpola 1994: 71 no. 83). If the sign depicts ‘scorpion’, the principal Proto-Dravidian word for it is *te:L* (DEDR 3470). This has the homophone *teL* ‘thin, fine, delicate, small’ (DEDR 3434), which would agree with the other Old Tamil name of the star Alcor, *ciRu-mi:n* ‘small star’. Another homophone *teL* ‘clear, lucid, bright, pure, knowing, learned’ (DEDR 3433) would suit the Alcor’s or pole-star’s connection with learning, to be discussed below.

The sign could however also depict scorpion’s ‘sting’ or ‘stinging’, in which case the most likely Proto-Dravidian word is *koTTu* (DEDR 2064 & 2063), with variant form *koNTi* (DEDR 2080). This is homophonous with Proto-Dravidian *koTTu*, *ko:Tu*, *koTi* ‘top of tree, tip of mountain, top tuft of hair, bird’s crest, pointed end, extremity’ (DEDR 2049). This conforms with the Rigvedic stanza (1,24,7) mentioned in connection with *vaTa-mi:n* as pole-star and its association with the cosmic banyan tree. The divine king VaruNa is said to hold up the ‘top of the tree’ (*vanasya... stu:pam*): its roots are high but descend downwards. Among the meanings of this ‘tip’ word in Tamil and Malayalam is ‘the pivot of door used as hinge, the projecting corners on which the door swings’; pivot is something that does fit the pole star.

(2) the ‘oval’ sign

Unfortunately, the word *vaTa-mi:n* occurs in Old Tamil texts no more than twice and *ciRu-mi:n*, another name for the same star, just once (cf. Lehmann & Malten 1992: 385a and 191b):

Kalittokai 2,21 *vaTa-mi:n po:R Rozute:tta vayankiya kaRpina:L*
 PuRana:nu:Ru 122,8 *vaTa-mi:n puraiyun kaRpin maTa-mozi*
 Perumpa:Na:RRuppaTai 302-3: *peru-nal va:nattu vaTavayin viLankum ciRu-mi:n puraiyun kaRpi-naRu-nuta*

In all these three references, *vaTa-mi:n* is symbol of ‘conjugal fidelity, chastity’, *kaRpu*. *KaRpu* literally means ‘learning’, from the root *kal*, ‘to learn’. This root is homophonous with the word *kal* ‘stone’. It seems significant that in the Vedic ritual, the bride is made to step on a stone and in the accompanying mantra asked to be firm like a stone (e.g. Baudha:yana-Grhyasu:tra I,7: *a: tiSThemam as'ma:nam as'meva tvam sthira: bhava;* cf. Winternitz 1892: 57-59). Exactly in the same way, and with a similar mantra, the youth initiated into the study of the Veda is made to step on a stone (e. g. Jaimini:ya-Grhyasu:tra 1,12 *imam as'ma:nam a: roha:s'meva tvam sthiro bhava*). Though nothing certainly compels this pictorial identification, stone

could be depicted by the other attributive sign that occurs before the sequence read as *vaTa-mi:n*; this sign is found also before the sequel read as *vaTa-veLLi* (cf. Parpola 1994: 231-2 with fig. 13.11). Its normal shape is a simple oval, but the graphic variants include a simple circle and a simple square (cf. Parpola 1994: 77 no. 341).

Of course this as any provisional reading has to be tested by checking whether it fits also to the other contexts where the sign occurs. I mention some of them. The ‘oval’ sign is sometimes reduplicated (M-1671), and sometimes it occurs alone (in particular on the stone-ware bangles, cf. M-1645 & M-1646) or as the only sign of a second line (cf. M-724, M-748, M-1202, M-1767) (there is some evidence that in such cases, a place or official title may be involved); moreover, the sequence of ‘oval’ + the sign looking like the ‘closing parenthesis’ may be yet another name or epithet of the god Muruku (cf. Parpola 1994: 234 with fig. 13.13). A significant further fact is that the sign is often drawn in very small size compared with other Indus signs. The shape, small size and possible connection with the child god Muruku connected with fertility makes one think that the sign could represent the egg, or the seed-stone of a fruit. The square-shaped graphic variant does not agree with the ‘egg’ hypothesis, but is not an insuperable difficulty, as the square shape of the Chinese sign for ‘mouth’ shows. Smallness is associated also with the star Alcor or Arundhati:, which is called in Tamil also *ciRu-mi:n*, ‘small star’, on account of its poor visibility. This thread could be followed further, but I return to the pole star.

The ‘steadfastness’ and ‘immobility’ is the main quality associated with the pole-star. It is called in Sanskrit *dhruva-*, for which a dictionary gives the following meanings: ‘firm, stable, constant, permanent, perpetual, fixed, immutable’. When the pole-star is shown to the bride in the Vedic marriage ceremony, she is made to say: ‘You are the Firm one (*dhruva-*), may I become firm (that is fixed) in the house of my husband So-and-so’ (Jaimini:ya-Grhyasu:tra 1,21). Some manuals (e.g. HiraNyakes'i-Grhyasu:tra 1,22,14 - 1,23,1) prescribe that the groom too should address the pole star with a mantra. This formula originally belongs to the royal consecration, where it was to be uttered by the king:

“I know thee as the **nave** of the universe. May I become the nave of this country.
I know thee as the **centre** of the universe. May I become the centre of this country.
I know thee as the **string** that holds the universe. May I become the string that holds this country.
I know thee as the **pillar** of the universe. May I become the pillar of this country.
I know thee as the **navel** of the universe. May I become the navel of this country.”

Among these appellations of the pole star, the string corresponds to Dravidian *vaTa* ‘rope’ in *vaTa-mi:n*. With regard to the nave we may note that the axle of a primitive cart was either fixed or could move with the wheels, so the nave of its solid wheels was either circular or square. This concept explains perfectly the ‘oval’ sign and its graphic variants. Two ‘oval’ signs have been connected to each other by a horizontal bar to form another sign that could represent ‘axle’ (cf. Parpola 1994: 77 no. 335 and M-326 D). Another sign (no. 334 and M- 326 A) has been formed by fixing a vertical bar to support the ‘axle’: this vertical bar could represent ‘draught-pole’ and the whole sign could stand for that or for ‘cart’. For ‘nave’ of the wheel, the *Dravidian Etymological Dictionary* (DEDR = Burrow & Emeneau 1984) offers just one word, *tu:mpu*, which also has such meanings as ‘big hole, sluice, gutter, eye of a spade’. There are several words for ‘navel’, which in Proto-Indo-European was used for ‘nave’ as well. None of these Dravidian words, however, seems to yield senses or homophones that would extraordinarily well suit to the ‘pole star’ context.

The ‘firmness’ aspect of the pole star seems to match well with the Proto-Dravidian root *nil* ‘to stand’, which occurs also reduplicated, cf. Malayalam *nila-nilkka* ‘to stand firm, be established’, *nila-nilppu* ‘steadfastness, stability’, *nilakku nilkka* ‘to keep one’s station and duty’, and Tamil *nilai-nil-* ‘to stand firm, as in one’s principles, to stay firmly’. The noun *niRai* from the causative of *nil-* means ‘bringing to a stand, stopping, fixed position, moral firmness, complete self-control, and chastity, marital fidelity’ (this last meaning in Old Tamil MaNime:kalai 18,100). In Tamil, the noun *nilai* is also used of stars (cf. *nilai na:L mi:n* ‘the established star’, of the Mu:la constellation Hart 1975: 73), while in Malayalam *graha-nila* denotes the ‘position of planet(s)’. Tamil *nilai* further means ‘door post’, on which the door-frame is fixed, and which swings on *nilai-k-kal*, the ‘stone base for door-frame’. The pivot-stone (and I have seen several such pivot stones in the Indus city of Dholavira) would be a fitting symbol for the pole star, and would tie up with the stone used as a symbol of firmness in Vedic ritual. An alternative pictorial interpretation for the ‘cart’ sign (no. 334) with the ‘oval’ signs as its elements could be ‘scale, balance, weighing’, which are among the meanings of Tamil *niRai*.

The above quoted verse called the pole-star the ‘centre’ as well as the ‘pillar’ of the universe. Both of these concepts are implied in the Proto-Dravidian word *naTu*, which on the one hand is the most important expression of ‘middle, centre’ (DEDR 3584), in Tamil also ‘zenith, the topmost part of the heavens’, and on the other hand is a verbal root meaning ‘to set up, as a pillar, fix in the ground, fix

firmly, plant, set, place, establish'; cf. also Tamil *naTu-kal* 'memorial stone fixed in the ground for a deceased hero' (DEDR 3583). Reduplication is also attested in Tamil *naTTa-naTu* 'the very middle'.

One looks in vain in Old Tamil texts for a comprehensive coverage of Dravidian terms associated with the pole star. It would help to know what terms are actually used in Tamil and other Dravidian languages. They form an important test stone against which these and hypotheses must be compared. We can also reasonably expect that the right solution adequately and naturally fits all the contexts where the Indus sign studied occurs (all of them have not been mentioned), and none of the tentative interpretations offered here is wholly satisfying.

These glimpses into my unfinished efforts at decipherment of further Indus signs must suffice for the time being. Thank you for your interest and patience.

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