



Join Us for Lunch

Iconic, Indexical, and Numeric Signposting Used by the Penan for Communicating in the Rainforest

Philip Hindley

Abstract. – The nomadic Penan hunter-gatherers of Sarawak use a signpost system to transfer information among individuals and groups while travelling through the rainforest. These signposts consist of a central pole on which are placed artefacts, here termed simulacra. Not only do these simulacra have specific meanings, but they can be associated to create complex holistic messages concerning the activities of band members. The simulacra are categorized into three types: iconic, indexical, and numeric and the interpretative pathways required to read the signposts are examined. Analyzing communication systems of this nature could provide insights into how symbolic proto-languages evolved in our ancestors. [*Malaysia, Sarawak, Penan, hunter-gatherers, semiotics, hunting communication systems, message sticks*]

Philip Hindley is a senior lecturer at the Université Paris 1 Panthéon-Sorbonne. – More recently he has been on a secondment at the Muséum National d’Histoire Naturelle in Paris where he works on hunting communication systems among hunter-gatherers. – He has documented the systems of several Khoisan ethnic groups in Botswana (see References Cited) and the Hadza of Tanzania (in preparation).

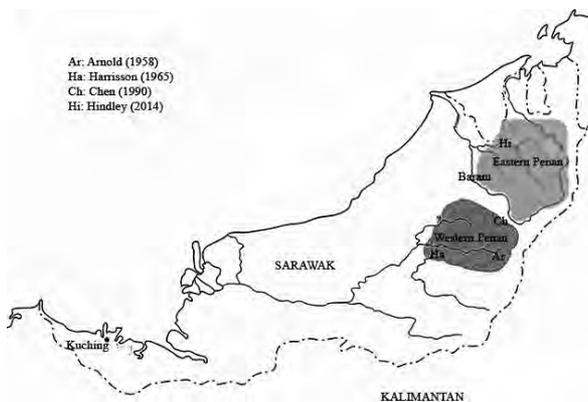
1 The Penan From Past to Present

It is unclear how long the Penan or Punan have lived in Borneo. *Homo sapiens* has been present on the island for at least 40,000 or 35,000 years (King 1993: 59; Sellato 1994: 9).¹ However, the ancestors of contemporary “native populations” probably arrived on the island around 4,500 years ago (King 1993: 59). Hoffman (1986) hypothesized that they were originally sedentary agriculturists who took up a hunter-gatherer life style due to economic cir-

cumstances. However, Hoffman’s evidence to support his hypothesis is strongly contested by Brosius (1988), Kaskija (1988) and Sellato (1988). See Sellato (1994: 115–117) for a discussion concerning the origins of the Punan.

Nowadays, the Penan are found in East Kalimantan, Sarawak and Brunei (Sercombe and Sellato 2007: 4). The Penan of Sarawak are divided into two ethnic groups with distinct dialects: the Western and Eastern Penan (Needham 1972; Brosius 1991; Sercombe 2007: 12) named respectively the Penan Silat and the Penan Selungo (Bruno Manser Fonds). The Eastern Penan, who feature in this study, inhabit the eastern regions of the Baram River including the district of Limbang (Sellato and Sercombe 2007: 12). They live in upland evergreen mixed dipterocarp forest in the interior, away from major rivers. The distributions of the two groups are shown

¹ Anderson (1979: 204) claimed that Penan refers to the Sarawak eastern group and Punan to the western, more settled group, whereas Endicott (1999) illustrated a map of Borneo labelled the Penan in Sarawak/Brunei and the Punan in Kalimantan. According to Sercombe (2007: 7) Punan or Penan are exonyms irrelevant to the peoples thus labelled. Some authors believe that variations in spelling have stemmed from how the generic word is articulated (Harrisson 1975: 4 & Sercombe 2007: 7). Sellato (2007: 30) proposed the generic title “Pnan” to denote all nomadic groups in Borneo. According to him this term: “reflects the phonological rendition of Penan and Punan.” The word Punan has been variously translated as meaning “up river” or “headwaters” by Harrisson (1949 in Lebar 1972: 176) and as “errer en forêt” (to roam the forest) by Sellato (1989: 25).



Map 1: Map of Sarawak showing the approximate locations of the study sites of the authors mentioned in the text. Drawn with reference to Brosius (1997) and Bending (2006).

in Map 1 and Appendix 1 summarizes the major differences between these two populations, according to Langub (2008).

When Sarawak joined Malaysia in 1963 the Penan began to settle in large numbers (Brosius 2007: 307). This was accelerated by Malaysia's new economic policies (King 1993: 273). Today, few of them follow a truly nomadic hunter-gatherer way of life: five percent of The Eastern Penan and none of the Western Penan (Brosius 2007: 331). In the 1970s the Eastern Penan started to attract international attention with the onset of their land-rights campaign (Langub 1990: 6; Brosius 1993; Brosius 1997: 48; Brosius 2007) aided by the Swiss environmentalist Bruno Manser. The campaign aims to fight against land loss to logging companies, see Bending 2006 for a detailed account of Penan activism. Western Penan have had a more resigned approach to logging and rather seek compensation for loss of their traditional hunting and gathering grounds than demonstrate active resistance to logging companies (Brosius 1999: 316).

2 Hunting and *Molong* Stewardship Practices

Traditionally, Penan nutritional needs are gained from hunting, fishing, gathering, and forest stewardship. They have been reported to exhibit "high residential mobility" (Barker et al. 2007: 257) due to widely scattered key food resources. They are divided up into autonomous bands of 20 to 50 people consisting of nuclear families – a married couple with their children sometimes accompanied by a widowed parent (Sellato and Sercombe 2007: 20). Langub (2008) reported larger groups for the Western Penan (see Appendix 1). Sellato and Sercombe

(2007: 16) resumed Sellato's (1994) idea of hunter-gatherer societies in Borneo as:

open, individualistic, pragmatic, opportunistic, egalitarian and little inclined to formal religious belief and philosophy. Individuals are equal within society, and free to make choices that they feel are best for them. Practically, this is realised in a high level of autonomy for each nuclear family, vis-à-vis the band.

The Eastern Penan hunt with blowpipes and poisoned darts (Brosius 1991: 145). The poison *tajem* (Siy 1993: 26; Chan 2007: 143) is obtained from the sap of the Ipoh tree, *Antiaris toxicaria* (Anderson 1979: 205; Needham 1988: 129). Hunting dogs are also used extensively especially by the Western Penan. Harrison (1965: 68) described the "dog talk" of the Western Penan as a special way of communicating with and naming hunting dogs. Major prey species are: the bearded pig (*Sus barbatus*); the sambar deer (*Cervus unicolor*); the red muntjac (*Muntiacus atherodes*); monkeys, especially the long-tailed macaque (*Macaca fascicularis*); squirrels and many bird species. However, the bearded pig is particularly favoured (Sellato and Sercombe 2007: 18).

The Penan gather fruit, vegetables, nuts, and sago from the forest. The sago palm (*Eugeissona utilis*) is considered an important source of starch (Brosius 1991). They practise forest stewardship through "well-established principles of land tenure and a sophisticated system of resource management" termed the *molong* or *mullah* concept (Brosius 1991: 143 f.; 1997: 55). These practices are believed to be extremely ancient and may indeed date back to the Neolithic period (Hunt 2012: 212). The *molong* is a mechanism of preserving and fostering food resources in the forest whereby communities, individuals, and even children claim fruit and timber trees as well as sago groves by carving marks into the bark of the claimed trees (Brosius, 1986: 175 f.; Davis 1993: 25; Langub 1988: 207; Chan 2007: 149).²

3 Signposting the Forest with Message Sticks

Sticks stuck in the ground are also used to *molong* trees (Chen 1990: 22). Davis and Henley (1990: 114) interpreted these signs as reading "please share wisely" rather than "no trespassing." The message sticks inform that only the older sago stems may be

² Brosius (2007: 313) mentioned that, compared to the Western Penan, the "Eastern Penan do not *molong* resources to any significant degree." However, the Eastern Penan informants in this study did describe ways of marking trees to preserve as *molong* resources.

harvested leaving the younger ones; the *uvud* (Brosius 1991; Voeks and Sercombe 2000: 683 citing Langub 1989) or that only fruit that has fallen to the ground may be gathered (Chen 1990: 22). By these means of signposting trees forest resources can be managed in a sustainable way.

Several authors have also mentioned Penan signposting used in other contexts. Hose (1912: 111) described how Punan hunters bent down twigs to mark the path back to camp after killing a pig. Hose also made use of Punan tree marking to open up trade with them:

a cleft stick was set up at some twenty paces from the camp with a large cake of tobacco in the cleft, and on the stick a mark was carved which would be understood by the Punans as implying that they were at liberty to take the tobacco.

Siy (1993: 47) termed the activity “sign language, called *saang*” by the Penan. The system consists of sticks *poked* into the ground to which feathers and leaves are attached. These sticks inform others, not only of food availability, but also locations to be avoided because of the bodies of deceased individuals. Sercombe (2007: 33) mentioned “message sticks” and cut flora arranged in particular ways to convey messages (Sercombe 2010: 632).

More detailed reports come from Arnold (1958) who provided accounts and diagrams of the varied forms and meanings of “message sticks” used by the Punan Gang of the Usun Apau Plateau, south of the Baram river. Harrisson (1965) also documented and illustrated message sticks among the Punan Busang from the “upper Baloi-Rejang headwaters in Sarawak’s Third Division” and compared his records with those of Arnold’s. Chen (1990: 21 f.) provided further information on what he termed “sign sticks” constructed by the Western Penan of Long Belian.

To date, research has focused on descriptions of signposting performed by the Western Penan; however, to the best of this author’s knowledge, no taxonomic or semiotic analysis has been carried out on these systems. The purpose of this article is to describe, categorise, and compare Eastern Penan signposting with the descriptions provided by the work of Arnold (1958) Harrisson (1965) and Chen (1990). Subsequently, these communication systems are analyzed within a semiotic framework based on the work of Ferdinand de Saussure and Charles Sanders Peirce.

4 Methods

Information for the study was obtained from one principal Eastern Penan informant with some addi-

tional information collected from three subsidiary informants who were also Eastern Penan. The interviews took place at Long Iman on the Tutoh River a few kilometres from Gunung Mulu National Park (Anderson 1979: 204). Although now settled at Long Iman, the principal informant had previously led a nomadic hunter-gatherer lifestyle in the rainforest. The other informants had been living in settlements since their birth. One of the subsidiary informants acted as an interpreter for the principal informant; the interviews were conducted both in English and Bhasa Malaysian.

The original purpose of the interviews was to collect information concerning non-verbal communication used to coordinate hunting episodes: hand gestures, whistles, bird calls and so forth. This was explained to the informant. However, subsequent informal conversations and open-structured interviews uncovered that, although gestural and audio communication are used by the Eastern Penan while hunting (Appendix 2), they also leave “written” messages to each other while travelling along forest trails. These messages take the form of signposts constructed from tree trunks, branches, twigs, and leaves. They are destined for other members of the band and, in some cases, other ethnic groups with whom the Penan share the rainforest. The documentation of this signposting system became the main aim of the study.

The informant used sticks and leaves to set up models of the signposts, which consist of a central post and associated artefacts. He manufactured these artefacts from natural resources (leaves, branches, and vines) using a machete (*parang*). The sapling tree trunk shown in Figure 1 was chosen by the informant to simulate the central post for demonstration purposes. Normally the trunk has a wider diameter of approximately 6 cm (Fig. 2). Photographs and sketches were made of these signposts. The informant was then asked to explain in detail the meanings of the individual artefacts and their assemblages on signposts.

As previously mentioned, the informant was also questioned about audio and gestural communication used between hunting partners in the forest to attract attention, direct attention towards game, and convey information concerning the identity of game species. An illustrated guide of the mammals of Borneo (Payne et al. 1985) was used to collect the data on the iconic gestures used to portray different animals. Demonstrations by the informant of these gestural signals and non-verbal sounds were filmed and recorded. These data are summarized in Appendix 2.

5 Findings

The Penan use a network of traditional footpaths in the forest (Sellato and Sercombe 2007: 20). While travelling along these trails, they place artefacts in clefts cut into tree trunks or implant sticks into the ground. These act as signposts to convey messages to other groups providing information concerning their direction of travel, activities, hunting successes and failures. On certain occasions a hunting party may separate at an intersection along a trail. Hunters will subsequently return to this point to post up or consult messages left on signposts.³

Signposts are often constructed on young trees with trunk diameters of approximately 6 centimetres. Clefts are cut into the side of the trunk to act as supports for the artefacts which will subsequently be interpreted as messages. Not only do individual artefacts have ascribed meanings, but meanings can be extended through combining artefacts to produce quite complex messages. In this article signposts and the messages they convey will be considered as semiotic texts.

5.1 Terminology

Before presenting the interpretations of signposting offered by the informants it was deemed necessary to provide the following terminology.

Simulacra are the individual artefacts used to make up the signpost. These correspond to the “representamens” described by Peirce (Bergman 2014) or the iconic and indexical “signifiers” (*signifiants*) described by Saussure ([1916] 1995: 99). In Table 1 the simulacra are described according to their shape and the material(s) used in their construction. In the text they are named according to their referents, i.e. the object a simulacrum represents iconically. Hence, a leaf cut into an oblong shape and folded is referred to as an *empty-plate simulacrum*.

Simulacra were classified into three types: iconic, indexical, and numeric/quantifying.

Iconic simulacra, similar to pictograms, iconically represent objects such as utensils, tools, weapons or other household items. In some cases they are more like ideograms which stand for concepts such as sameness.

Indexical simulacra are leaves and branches that have been displaced or manipulated in some way so as to convey directions and orientations.

Numeric/quantifying simulacra are used to represent numbers of days, people or distances. They take the form of knots tied in rattan, notches cut into sticks or the number of leaves left on a sapling. All the numeric simulacra are countable or measureable in some way.

Referents are the actual object on which the shape of the simulacrum is based.

Icons refer to what the simulacra represent, i.e. the referent.

Indexical interpretation or *index* in Peircean terminology refer to the connotations conveyed by the icon. For example, an empty-plate suggests that there is no food available.

Holistic messages are the ultimate messages conveyed to the “reader” by the associations of simulacra. Signposts are considered as “texts” that are interpreted by readers to obtain the final holistic message. Readers become literate through negotiating within Penan groups jointly-agreed meanings for these assemblages.⁴ The messages reported in this article are transcriptions of the informants’ interpretations of the signposts they demonstrated.

Signposts are the physical supports (usually a young tree) accompanied by their simulacra which are held in clefts cut into the bark. These were termed “message sticks” by Arnold (1958) and “sign sticks” by Chen (1990).

Syntactic clefts cut into the trunk allow the simulacra to be placed in specific orders possibly providing a primitive syntax for the message “text”.

5.2 Holistic Messages and Their Pathways of Interpretation

Discussions with the informants uncovered the pathways of associations that lead the “reader” from the initial perception of the simulacra to the final intended holistic message. These pathways involved four interpretive steps which are described below using the example of the empty-leaf-plate simulacrum shown in Figure 1.

³ Arnold (1958: 74) considered message sticks to be unidirectional forms of communication transmission; although, Chen (1990) mentioned that, on occasions, replies are posted up on existing signposts to inform that the initial message has been read and that the group has returned to camp.

⁴ According to Harrison (1965: 75) the systems used by the Punan Gang of the Usun Apau Plateau (Arnold 1958) and the Punan Busang from the headwaters of the Baloi-Rejang do not necessarily correspond.



Fig. 1: Hunting unsuccessful.
 Simulacrum: leaf cut in oblong shape (12 cm).
 Icon: empty plate.
 Index: no food.



Fig. 2: I will fight/kill you.
 Simulacrum: knife-shaped stick (27 cm).
 Icon: *parang* knife.
 Index: stabbing/killing.

Step 1: From simulacrum to icon

The leaf cut into an oblong shape is perceived as an icon representing the referent an “empty plate”.

Step 2: From icon to index

The empty-plate icon is indexically associated with the absence of food and is interpreted as “no food”.

Step 3: From index to message

This final interpretive step depends on the reader having knowledge of the context in which the message was left, i.e. if he knows the group went hunt-

ing he interprets the message as “This is not a good place for hunting” or “Unsuccessful hunt.” Alternative interpretations can be made depending on associations with other simulacra. These associations are discussed further on.

Table 1 lists the iconic simulacra, accompanied by the iconic and indexical interpretations provided by the informant, in addition to the final holistic messages conveyed. More details and photographs of these simulacra are given in Appendix 3.

Table 1: Iconic simulacra.

Simulacrum	Icon	Index	Holistic message	Reference
leaf cut into oblong shape and folded	empty plate	no food	Unsuccessful hunt.	Hindley (Fig. 1)
frond-centre of palm with trimmed leaves stuck in ground			Unsuccessful hunt or no sago palm in this area.	Harrison (1965: 79)
folded leaf containing sago, feathers, or bone	full plate	food	Food available + nature of food: sago, bird, meat.	Hindley
sago, feathers, bone or fruit		game or fruit		Harrison (1965: 79 & 82)
rolled leaf			Food available.	Arnold (1958: 75)
leaf pierced with leaf stalk	barbecued meat	game	Successful hunt.	Hindley (Fig. 12)

Table 1: Iconic simulacra (*cont.*).

Simulacrum	Icon	Index	Holistic message	Reference
ladle leaf shape	ladle	liquid (soup)	Soup available.	Hindley (Fig. 13)
ladle leaf shape	ladle	liquid (water)	Gone to the river.	Hindley (Fig. 13)
long leaf stalk	fishing rod	fishing	Gone fishing.	Hindley (Fig. 9)
stick with frayed ends	fork	eating	Dead body when associated with no-through-way. ⁵	Hindley (Fig. 14)
Y-shaped wood tied to bark and attached to stick with rattan			Dead body.	Harrisson (1965: 79)
knife-shaped stick	parang	stabbing	I will fight/kill you. Danger.	Hindley (Fig. 2) Chen (1990: 21)
			Possibly unwelcome visitor in the camp.	Harrisson (1965: 82)
hook-shaped piece of wood ⁶			Going on a hunting trip.	Harrisson (1965: 82)
<i>Kelipui</i> plant inserted at the top of the stick ⁷			Gone to visit another group.	Harrisson (1965: 82)
fibre tied in loops to the top of the stick			Several people have gone on a long journey.	Harrisson (1965: 82)
dart replica	poison dart	killing	Danger.	Chen (1990: 22)
bundle of vines	medicinal herbs	sickness	Someone is ill and needs help.	Hindley (Fig. 15)
grass wound into a circle	manacle	punishment	Pay a fine.	Hindley (Fig. 8)
two short shaved sticks of the same length	sameness	same tribe	Message only for Penan.	Hindley (Fig. 11 & 16)
two short shaved sticks of different lengths	differentness	different tribe	Message concerns other ethnic groups.	Hindley
stick with sharpened end & spiral carving	speediness		Hurry.	Hindley (Fig. 17)
piece of firewood			Urgent matter hurry.	Arnold (1958: 76)
arrow shaped piece of wood	arrow		Gone home.	Arnold (1958: 75)
uprooted sapling	family tree	family	One family involved.	Hindley (Fig. 11)

5.3 Indexical Simulacra

Signs were classified as indexical simulacra when they indicated that the message reader must: travel in a particular direction (Fig. 3); not trespass (Figs. 4–7); not go in a certain direction (Fig. 10); or wait at a designated point (Fig. 20). With the exception of two cases explained in footnotes 8 and 9, these simulacra lacked step two: iconic representation to indexical representation and so were considered to be directly indexical. They were constructed from leaves of various sizes, bent sticks and, in the case of

5 The informants explained that dead bodies were left in the person's dwelling place, which was then abandoned. This is substantiated by Sellato (1994: 158–160) who also mentioned that bodies were sometimes left on stones.

6 The hook-shaped stick also serves as propitiation for a successful hunt (Harrisson 1965: 82).

7 As with the hook-shaped piece of wood, "The stick records the event and simultaneously [using *Kelipui*] sanctions its good fortune" (Harrisson 1965: 82).



Fig. 3: Take this direction.

barriers, large tree trunks. Arnold (1958) and Chen (1990) also illustrated indexical simulacra manufactured from sticks implanted into the ground. These are listed in table 2 along with the indexical simulacra described by the informant.

5.4 Indexical Simulacra Acting as Barriers

Barriers are also considered to be indexical simulacra since they indicate or “point” to an area not to trespass upon. The informant explained that barriers

Table 2: Indexical simulacra.

Simulacrum	Holistic message	Figure references
top of sapling bent in direction of travel	Take this direction.	Hindley (Fig. 19)
shaved stick stuck in the ground pointing in a direction	Have gone in this direction. (May also indicate location of a fruiting tree).	Chen (1990: 21–22)
shaved stick without leaves at end of stick	Someone is not far ahead.	Harrison (1965: 76)
shaved stick with leaves at end of stick	Someone is far ahead.	Harrison (1965: 79)
shaved stick stuck in ground and bent so top half points to the ground	Have gone ahead. Make camp here and wait for us to return.	Chen (1990: 21)
two shaved sticks stuck in ground to form a V-shape ⁸	Party has split up.	Chen (1990: 22)
A V-shape as above with a stick pointer placed horizontally between the shaved sticks	Leading group has returned in the direction indicated by horizontal pointer.	Chen (1990: 22)
arrow-shaped stick	Gone home.	Hindley
large leaves at base of trunk aligned in a certain direction	Take this direction.	Hindley (Fig. 3)
large leaves at base of trunk	Wait for us here.	Hindley (Fig. 20)
larger leaves in front of smaller leaves ⁹	Don’t take this direction.	Hindley (Fig. 10)
barriers	No trespassing.	Hindley (Figs. 4–7)

⁸ The V-shaped stick iconically represents two directions.

⁹ The reduced size of the leaves iconically represents a path petering out that is indexed to “no-through-way.”



Fig. 4: Elongated oval carving.



Fig. 5: *Parang simulacrum* and crossed sticks.

function to demarcate areas and warn people that no hunting or planting is allowed. They were much more complex than the other indexical simulacra and included iconic simulacra and bark carvings that conveyed interdictions and threats. The barrier

that was set up as a demonstration by the informant was made up of four components:

- (1) a sapling with an elongated oval carving in its bark (Fig. 4);
- (2) a tree with one cleft holding a *parang simulacrum* (Fig. 5);
- (3) crossed sticks (Fig. 5) with their thinnest ends implanted into the ground and a face carved on to the thicker end of the right-hand branch (Fig. 6);
- (4) a tree trunk with an oval shape carved into the bark (Fig. 7).

These barriers are accompanied by *sameness simulacra* if the message is for other Penan or *differentness simulacra* if it is destined for other ethnic groups. The *parang simulacrum* can also be accompanied by the *manacle simulacrum* indicating that trespassers will be punished or fought (Fig. 8). Chen (1990: 22) described a similar barrier used by



Fig. 6: Face carving.



Fig. 7: Oval shaped carving to the right of the path.

the Western Penans of Plieran as: “Three shaved sticks stuck vertically into the ground to form a fan-shape.”

5.5 Numeric and Quantifying Simulacra

Numeric simulacra include items that can be counted, such as knots tied on rattan, notches cut into sticks, and leaves left at the apex of saplings. The number of items indicates how many days or how many people are involved in an expedition. For example, the informant explained that if two individuals wish to meet in seven days’ time, they both take a length of rattan and tie seven knots on each piece. After separating, they untie a knot each morning and, when there are no more knots left on the rattan, they meet up again at a pre-designated spot. Lau (1987: 15) also described this method of time keep-

ing. Arnold (1958) mentioned “tally sticks” with “sets of shavings” or notches made on branches corresponding to the number of leaves left at the end of the branch. These simulacra indicate how many people are travelling in the group. Similarly, the informant explained that several *family-tree simulacra* placed in a cleft on a signpost indicate the number of families involved in a particular activity.

Quantifying simulacra consist of two sticks of different lengths that can be compared to indicate distances travelled and distances to destinations. How much of the journey is left to be completed is estimated by comparing the difference in lengths between the implanted sticks. The informants did not mention these kinds of simulacra; however, Arnold (1958) and Chen (1990) both provided detailed descriptions. Table 3 lists numeric and quantifying simulacra. Interpretations of these simulacra were



Fig. 8: *Manacle simulacrum* (18.5 cm) in top cleft associated with *parang simulacrum* (27 cm) in lower cleft.

Table 3: Numeric and quantifying simulacra.

Simulacrum	Icon/index	Holistic message	Reference
short stick in front of long stick	long stick represents distance completed & short stick distance to destination.	Destination is not far ahead.	Arnold (1958: 75) Chen (1990: 21)
long stick in front of short stick	long stick represents distance to destination & short stick distance completed.	Destination is still far ahead.	Arnold (1958: 78) Chen (1990: 21)
two sticks of equal length	first stick represents distance completed & second stick distance to destination.	You are at the half-way point of the journey.	Chen (1990: 21)
length of rattan tied around a stick	unclear	The first party waited a long time.	Arnold (1958:76)
knots tied in rattan	number of nights to destination	There are X number of night's rest before you reach your destination.	Chen (1990: 21)
knots tied in rattan	number of nights to next meeting	There are X number of nights until the next meeting.	Hindley
leaves left on branch accompanied by same number of knots tied in rattan	number of nights to destination	There are X number of night's rest before you reach your destination.	Chen (1990: 21)
stick with circular notches		Party has got an enemy head, each notch represents one head. ¹⁰	Harrisson (1965: 82)
stick cut to a certain length accompanied by hair from pig's chin	Length of stick indicates quantity of pig fat	There is X amount of pig fat available.	Harrisson (1965: 79)

considered to be both iconically and indexically linked.

5.6 Associations of Simulacra That Modify and Extend Meaning

In some cases simulacra are assembled together on signposts in the same cleft or in separate clefts cut into the trunk at various heights. These associations not only extend the meanings of messages, but can also modify the sense of an individual simulacrum. For example, the *ladle simulacrum* means “soup” when associated with the *barbecued-meat simulacrum* to produce the final holistic message: “We have barbecued meat and soup.” However, when the *ladle simulacrum* is associated with the *fishing rod*

simulacrum the indexical link is “river water” and the final message reads: “We have gone to the river to fish.”

The message conveyed by the signpost shown in Fig. 9 can be glossed as:

“Unsuccessful hunt; gone to the river to fish.”

This can be represented as follows:

Upper cleft:

Leaf with long leaf stalk placed in front [simulacrum] – fishing rod [icon] – fishing [index]

Lower cleft:

Ladle-leaf-shape [simulacrum] – ladle [icon] – liquid – water – river [index]

Four further messages based on associations of simulacra are described below, three were demonstrated by the informant and one is cited from Arnold (1958).

¹⁰ This information was provided by Harrisson (1965: 82) despite the fact that the Penan were not known to be head-hunters (Urquhart 1954: 122).



Fig. 9: Unsuccessful hunt; gone to the river to fish.

Message 1: “Successful hunt; have barbecued meat and soup. We are over here.”

Upper cleft:

Leaf pierced with a leaf stalk [simulacrum] – barbecued meat [icon] – successful hunt [index]

Lower cleft:

Ladle leaf shape [simulacrum] – ladle [icon] – soup [index]

Message 2: “Hurry someone is sick and needs help.”

Upper cleft:

Stick with spirally carved pointed end [simulacrum] – speed [icon] – hurry [index]

Lower cleft:

Bundle of grass [simulacrum] – medicine [icon] – sickness [index]

Message 3: “Have gone home for food.” (Arnold 1958: 75)

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Upper cleft:

Arrow-shaped piece of wood [simulacrum] – home [icon/index]

Lower cleft:

Rolled up leaf [simulacrum] – food [icon]

Message 4: “There is a dead body, do not go in this direction.”

Upper cleft:

Stick with frayed ends [simulacrum] – fork [icon] – eating – living [index]

At the base of the trunk:

Larger leaves followed by smaller leaves [simulacrum] – path petering out [icon] – no-through-way [index]; “Don’t go in this direction.” [message] (Fig. 10).



Fig. 10: Don’t take this direction.

Simulacrum: Larger leaves followed by smaller leaves.

Icon: Path petering out.

Index: cul-de-sac.



Fig. 11: Upper cleft *family tree* (30 cm) and *empty plate simulacra* (12 cm). Lower cleft contains *sameness simulacrum* (7 cm).

The indexical interpretation of “living” is negated by the interdiction contained in the indexical interpretation “no-through-way.”

All of the above messages also include indexical simulacra to show directions to take or not to take. In some cases, *family-tree simulacra* are used to convey the number of families involved and sticks of equal or unequal length to indicate if the message is intended for other Penan bands or for other ethnic groups using the forest. For example, the signpost in Figure 11 reads: “This is a message for other Penan. Unsuccessful hunt. One family left this message.”

5.7 Message Syntax

When questioned if the simulacra could be placed in different clefts, the informants replied that this was possible, but simply not done. They explained that customarily, the simulacra placed in the lowest cleft indicate to the reader who the message is intended for. The second and occasionally the third cleft contain artefacts to convey the message. The uppermost cleft informs the reader about the number of families involved in the activity. Finally, the top of the sapling is bent in the direction that the messenger has taken after leaving the site. The placing of the simulacra in specific cleft positions may constitute a primitive form of syntax:

message reader targeted – main message – people involved – direction of travel.

As previously mentioned, in some circumstances direction of travel is indicated at the base of the signpost using leaves placed on the ground.

6 Discussion

While moving through the forest, animals, including people, leave behind broken saplings, fallen leaves and discarded items on trails. During a tracking episode, an experienced hunter obtains information from these signs about the past and likely future activities of the animals he hunts. Collectively, these signs constitute a narration of events in the forest which can be considered, metaphorically, as a “forest text” accessible only to “readers” who are experienced trackers. When constructing a signpost, the Penan recreate these signs in the form of simulacra, which they assemble on signposts to produce their own semiotic texts.

These texts function similarly to the post-it left on the computer keyboard: “Join us for lunch.” They act as narrations of Penan activities and future movements, “Unsuccessful hunt so we’ve gone to the river to fish.” Imperative instructions: “Don’t go there!” and declaratives/informatives: “There is soup available.” They condense, on one single sign-

post, information that otherwise could only have been obtained through a lengthy tracking episode. Thus, Penan signposts constitute an efficient communication system aimed at conveying succinct holistic messages between individuals, bands, and other ethnic groups.

The elucidations provided by the informants suggest that the “reading” of these texts involves several interpretative steps during which iconicity becomes weaker as simulacra take on alternative meanings when assembled together. Firstly, individual simulacra are seen as icons, usually representing household items and weapons. These icons, in turn, conjure up associated behaviours such as eating, hunting, fishing, caring for the sick. This is indexical linking. Further connotations are created when artefacts are posted up together. These associations lead to modification and extension of original iconic representations. Along this interpretive journey from simulacra to message, iconicity is partially obscured to be replaced by quasi-symbolic representation. Jointly negotiated meanings of signposts within Penan bands and between ethnic groups would be necessary, otherwise, due to their quasi-symbolic nature, signposts would be open to a wide variety of holistic interpretations.

Signposting shares characteristics more akin to writing than speech or sign language. However, unlike true writing systems, signposting does not aim to represent full semantic/syntactic language. From a grammatical perspective, signposting is holistically semantic and shows some evidence of a primitive syntactic structure. In a semiotic context signposts can be considered as texts made up of highly motivated three-dimensional objects (simulacra). Saussure ([1916] 1995: 181) described a sign as highly motivated when it resembles closely the referent as is the case for the simulacra. The *ladle simulacrum* in Figure 13 looks like a ladle and can be readily perceived as such. Were we to consider signposting as a primitive form of writing made up of *simulacrograms* then this degree of motivation would place it at the beginning of a proto-writing continuum preceding the use of petroglyphs, pictographs, and ideograms.

7 Further Research

There are undoubtedly many non-linguistic communication systems used by hunter-gatherers that have not yet been fully recorded. The ones that we are aware of are also likely to be much more complex and extensively used than currently documented. Harrisson (1965) mentioned the “whis-

ting language” of the Penan. Hindley (2014) the iconic gestures used by the Khoisan during hunting, which are also employed by the Penan (Appendix 2) and the Hadza of Tanzania (Hindley in preparation). Further research into these forms of communication will enable us to document them as part of our cultural heritage before, given the current precariat nature of hunter-gatherer groups, they are lost for ever.

The interpretive pathways explained in this article demonstrate how highly motivated iconic signs can become quasi-symbolic through the process of interpretation. The study of these kinds of communication systems could give us insights into how full symbolic language developed in *Homo sapiens*. Could our ancestors have used similar non-linguistic communication systems before the appearance of full semantic/syntactic language or are such systems only within our cognitive reach because we already possess language? Future research might deliver an answer to these questions and provide insights into the nature of the communication precursors used by ancestral hominins before the evolution of proto-language.

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Appendices

Appendix 1: Major Differences between the Eastern and Western Penan According to Langub (2008)

	Eastern Penan	Western Penan
Location	East of the Baram river	Silat, Tin jar and Jelalong rivers as well as the Bintulu (coastal areas) and Miri (Suai-Niah) districts
Group size	20–40 members	60–200 members
Household size (average)	4	7
Extended family	Rare	More frequent
Housing	Camps on ridge tops	Adjacent to water courses
Camp system	1 tiered	Central base camps & ephemeral sago camps
Duration of occupation	1–3 weeks	1 year
Foraging areas	Small with considerable overlap between bands	Large little overlap
Hunting	Mainly blow pipes	Mainly dogs & spears
Prey species	Varied	Bearded pig (<i>Sus barbatus</i>)
Leadership institutions	Less developed	Some aristocracy status
Knowledge of genealogies	Little	Extensive knowledge

Appendix 2: Supplementary Information Concerning Hunting Communication

The Eastern Penan use indexical (deictic) pointing, imperative hand waving and other pan-human gestures in order to attract the attention of and direct hunting partners and to indicate the location of game. Hunters imitate the call of the Borneo Peacock (*Polyplectron schleiermacheri*) to transmit to their partners their position and ethnic identity. The informant explained that this audio signal is used exclusively by the Penan and not by other ethnic groups.

These signs are accompanied by iconic hand gestures to mimic the salient features (horns, claws, and snouts) of animals and silently convey the identity of the game to their partners. These gestural signals are very similar to those used by the Khoisan (Hindley 2014) and the Hadza (unpublished data). Whereas the Khoisan and the Hadza prey on many different large game species, the Penan hunt a much more limited number of large species. Consequently, they have fewer gestures. These are summarized in table 4. Puri (2005: 233) in his study on the Penan Benalui mentioned “many kinds of non-verbal communication used in a silent stalk”, but did not provide fur-

ther information. However, he did describe in detail how the Penan Benalui imitate the calls and sounds of a macaque troop in order to camouflage their presence while hunting for bearded pigs (Puri 2005: 233). They also attract prey species by using a variety of bird and other animal calls (Puri 2005: 235).

Table 4: Iconic gestures used by the Eastern Penan to convey the identity of prey species.

Game species	Iconic gesture
Deer species	Index fingers held above head to resemble horns
Sun bear (<i>Helarctos malayanus</i>)	Both hands held in front of body resembling claws
Bearded pig (<i>Sus barbatus</i>)	Right hand flattened, held sideways and waved from side to side to resemble a snout
Birds	Hands held out from the side of the body to resemble wings
Monkey species	Right hand scratching side of torso

Appendix 3: Iconic Simulacra

Here supplementary information is provided concerning the simulacra mentioned in the text.

(1) *Barbecued-meat simulacrum*

A leaf pierced with a leafstalk (Fig. 12) represents barbecued meat. It conveys the message that a hunt has been successful and that meat has been taken back

to camp to be consumed. The whereabouts of a good hunting area can also be indicated by a petiole protruding from the leaf in the direction of the location.

(2) *Ladle simulacrum*

A palm leaf folded and held together by “toothpicks” to form the shape of a ladle. (Fig. 13). This simulacrum has a dual meaning depending on its association with other simulacra. Accompanied by the *barbacued-meat simulacrum* it conveys the message that soup is available for consumption. Accompanied by a *fishing-rod simulacrum* it represents a river.

(3) *Fork simulacrum*

A short stick stripped of bark with a brush-like end iconically represents a fork (Fig. 14). This simulacrum was introduced in conjunction with the *no-through-way indexical simulacrum*. The joint association conveyed the message: “Do not go in this direction, there is a dead body in the vicinity.” Although the fork is indexically linked to eating, this is negated to not eating/death/dead body by association with the indexical simulacrum.

(4) *Parang simulacrum*

A piece of wood cut into the shape of a knife (Fig. 2) represents fighting and informs the reader that the messenger is ready to fight. It may be in association with other signs such as the *manacle simulacrum* to indicate that transgression will lead to a choice between paying a fine or fighting (Fig. 8). The *parang simulacrum* possibly corresponds to the “piece of wood” described by Chen (1990: 22) also used to indicate *molong* and deter other people from harvesting trees.



Fig. 12: Successful hunt. Simulacrum: leaf pierced with leaf stalk (25 cm). Icon: barbecued meat. Index: game.

Fig. 13: Soup or River.
 Simulacrum: ladle leaf shape (30 cm).
 Icon: ladle.
 Index: liquid.



Fig. 14: Dead body (When associated with *no-through-way*).
 Simulacrum: stick with frayed ends (16.5 cm).
 Icon: fork.
 Index: eating.



Fig. 15: Someone is ill and needs help.
 Simulacrum: bundle of vines (8 cm).
 Icon: medicinal herbs.
 Index: sickness.



Fig. 16: This is a message only for Penan.
 Simulacrum: two short sticks of the same length (7 cm).
 Icon: sameness.
 Index: same tribe.



Fig. 17: Hurry.
Simulacrum: stick with sharpened end and spiral carving (36 cm).
Icon: speediness.
Index: unclear.

(5) *Medicinal herbs simulacrum*

A small rolled up ball of grass, moss or other plant material represents herbal medicine and means that someone is sick and needs help.

(6) *Manacle simulacrum*

A thin liana or vine wound round to form a circle represents manacles and conveys the message that a punishment or the payment of a fine will be required. This may be associated with a barrier to convey the message that you will have to pay a fine if you trespass, harvest too much fruit or fell a tree (Fig. 8).

(7) *Sameness simulacrum*

Two short shaved sticks placed together in a cleft (Fig. 16) indicating that the message is only intended for the same people, i.e. the Penan.

(8) *Speediness simulacrum*

A spiral pattern carved into the pointed end of a shaved stick (Fig. 17) indicates that speed is required. This may be associated with the *medicinal-herbs simulacrum* to convey the message that someone is sick and speed is needed to come and help them.

(9) *Family-tree simulacrum*

An uprooted sapling (approximately 30 cm high) placed horizontally in a cleft represents one family. In Figure 18 two uprooted saplings are placed next to an empty folded leaf indicating that two families left this message. The *empty-plate simulacrum* further indicates that hunting was unsuccessful.



Fig. 18: We are two families.
Simulacrum: uprooted sapling.
Icon: family tree.
Index: family.

Appendix 4: Indexical Simulacrum

Simulacra acting as indexical signifiers indicate: directions to take or to avoid; instructions to wait at a designated point and areas of no trespassing. These messages are achieved through the use of leaves (Fig. 3), bent branches (Fig. 19), different leaf sizes (Fig. 10) and complex barrier structures (Figs. 4–8).

- (1) Top of sapling bent in direction of travel



Fig. 19: Take this direction.

- (2) Large leaves (20 cm) are placed around the base of a tree (Fig. 20) at a predetermined meeting point to indicate that members of the party must wait for the other group members at this spot.



Fig. 20: Wait here for me.

Appendix 5: Bark Carvings

Brosius (1991: 143) mentioned the claiming of trees in forest stewardship by means of carvings on the trunks of trees. Arnold (1958: 74) also gave some examples of elaborate carvings made both on stone and tree trunks. He described these as “signs made ‘in play’”.

Two types of carvings were described by the informants. In both cases they were employed in the stewardship of forest trees.

- (1) Marks are cut into the bark of a fruit tree to indicate that the tree has been claimed and the fruit must not be harvested or only partially harvested. These markings appear in the form of a face (Fig. 21).

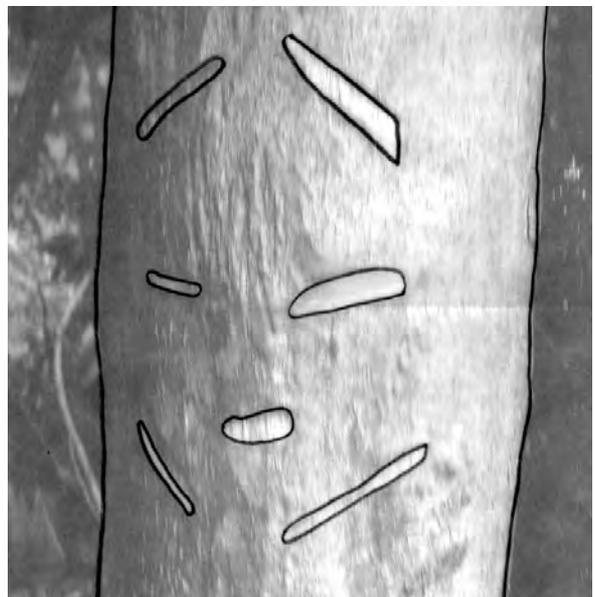


Fig. 21: This tree has been claimed.

- (2) Three vertical marks are cut into the tree to indicate that it must not be felled.



Fig. 22: Do not fell this tree.

