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Submorphemes: backtracking from English 'kn- words' to the emergence of the linguistic sign

Dennis Philps

1. Standard and dialect English 'kn- words' related to body-joints

In “Le sens retrouvé ?” (Philps 2000), I claimed that “The polysemy exhibited within that lexical subset of [Modern English] ‘kn- words’ having meanings that refer to certain parts of the human body is one consequence of a self-referential cognitive modeling activity motivated by the unconscious, kinesthetically transmitted perception of invariant metaphorical and metonymic relations characteristic of the conceptual domain in question, namely that of the human body.” (227, my translation). This claim stemmed essentially from an analysis of the structure and polysemy of Modern and dialect English ‘kn- words’, a word class established heuristically on the basis that each word it contains attests, word-initially, the semiological segment *kn-*, realized phonetically by [n] in Modern English.

Problematising this surface invariance phenomenon inevitably requires departing from a strictly linguistic perspective, if only because *kn-* appears to function as a sublinguistic (or, more specifically, submorphemic) segment in the class in question, which includes all and only those lexical items of Modern English that begin with *kn-*. A submorpheme is understood here as “a part of a morpheme that has recurrent form and meaning, such as the *sl-* beginning of *slimy*, *slug*, etc.” (Crystal 2003: 301). Now within this class, whose members display a range of meanings, there is, as also noted by Argoud (2007), a small subset of words (*knead*, *knee*, *knop* (dial.), *knuckle*, etc., see table 1 below) whose conventional meanings, although different, appear to correspond to a common underlying ‘notion’, since they all refer to articulated body-parts, or actions performed by such parts, and *only* to these, whereas most ‘kn- words’ have nothing to

do with this notion. The invariant notion in question may be attributed to *kn-* in the words concerned on the grounds that because the 'rimes' (Bolinger 1950) in this class (-*ead* in *knead*, -*ee* in *knee*, -*op* in *knop*, -*uckle* in *knuckle*, etc.) function as variables, they cannot convey an invariant value by definition. It may therefore be posited that *kn-* functions here as an indivisible, submorphemic 'core invariant' (<*kn-*>), defined as the smallest word-initial phonological segment in a given class of words to which a notion common to all the members of a heuristically established subset of this class can be attributed.

Although not usually treated as such in the literature (e.g. Firth 1930, Marchand 1969, Tournier 2007), word-initial *kn-* in this subset may be construed as a phonæstheme, phonæstheses being defined by Bergen as "frequently recurring sound-meaning pairings that are not clearly contrastive morphemes." (2004: 290). Word-initial phonæstheses in the English lexicon (which I have called 'sublexical markers', see Philps 2006) belong to one of two superordinate word-classes, which may be dubbed respectively 'SC- words' (e.g. *sn-* in the phonæsthetic set {*sneeze*, *sniff*, *snore*}, *sp-* in {*spade*, *spear*, *spit*}, *sw-* in {*sway*, *sweep*, *swing*}), and 'CR- words' (e.g. *br-* in {*breach*, *break*, *brittle*}, *gl-* in {*glisten*, *glisten*, *glow*}, *tr-* in {*tramp*, *tread*, *trudge*}). The phonæstheme *kn-* forms part of a noteworthy subclass of the latter which may be called 'ØR- words', in which what was originally a word-initial consonant cluster has become monoconsonantal by a process of phonetic 'reduction' dating back to Old English (Dobson 1968). This subclass also includes '*gn-* words', as in the phonæsthetic set {*gnash*, *gnaw*, *gnip* (dial.)} and '*wr-* words', as in {*wrench*, *wrest*, *wring*}. As noted by Barber, "In 1500, the initial clusters /wr-/ , /kn-/ , and /gn-/ still existed: *write* was *wræt* [...] , *knee* was [kni:], and *gnat* was [gnat]." He continues: "Initial /kn-/ was more persistent, and in StE it remained throughout our period [Early Modern English], though in the late 17th century it may have developed to /hn-/; the simplification to /n-/ did not take place until the 18th century." (1976: 317).

Table 1: English 'kn- words' denoting body-parts

'kn-word'	Conventional meaning(s) (body-joints) + earliest attestation if available	Conventional meaning (head) + earliest attestation if available	Conventional meaning (swelling) + earliest attestation if available	Etymology
<i>knap</i> (n., dial.)	point of the elbow, kneecap (EDD ^{III})	Ø; cf. the head, crest, or summit of a hill (OED, n. ¹ , c1000)	Ø	OE <i>cnop(p)</i> in the sense of 'top, summit (of a hill)' <PG * <i>kna-pp-</i> < * <i>g(e)n-</i> ¹

<i>knead</i> (v.)	to massage or squeeze with the hands, as if working dough etc. (NSOED, c950); cf. to manipulate or paw repetitively with or as with the action of (the claws of) a cat (OED, 1954)	Ø	Ø	< OE <i>cnedan</i> 'to knead' PG * <i>kn-e-d-</i> < * <i>g(e)n-</i>
<i>knee</i> (n.)	the joint, or region about the joint, between the thigh and the lower leg (OED, c825); cf. something resembling the knee in position or shape (1352 onwards); a joint in an animal likened to, or regarded as corresponding in position or shape to, the human knee (OED, c1450); cf. elbow-piece (1875)	Ø	Ø	< OE <i>cnēo(w)</i> 'knee' < PG * <i>knewā</i> < PIE <i>ǵenu-</i> 'knee, angle'
<i>knob</i> (n., dial.)	point/joint of the elbow, toes (EDD ^{III})	the head (OED, c1725)	a swelling on the skin or on a bodily organ (OED, c1386)	< Middle Low Germ. <i>knobbe</i> < PG * <i>kn-u-b-</i> < * <i>g(e)n-</i>
<i>knop</i> (n., dial.)	kneecap, elbow-joint (NSOED) the rounded protuberance formed by the front of the knee or the elbow-joint (OED, a14.. in the sense of 'knee', 1652 in the sense of 'elbow')	the head (EDD ^{III})	a swelling upon the skin (OED, 1556-8)	? OE <i>cnop</i> < PG * <i>kna-pp-</i> < * <i>g(e)n-</i>

<i>knot</i> (n., dial.)	knuckle (EDD ^{III})	the top of the head; cf. also nape or back of the neck (EDD ^{III})	a swelling or protuberance in a muscle (OED, a1225) swelling in human or animal tissue (EDD ^{III})	OE <i>cnotta</i> in the sense of 'swelling or protuberance...' < PG * <i>knu-t-</i> < * <i>g(e)n-</i>
<i>knuckle</i> (n., v.)	the bone at a finger-joint, which forms a rounded protuberance when the hand is shut (OED, c1375); cf. something shaped or protruding like a knuckle of a bone (OED, 1601); the length of the second finger from the tip to the knuckle; the middle joint of a finger (EDD ^{III}); (v.) to tap, strike, press, or rub with the knuckles; <i>golf</i> : to bend (the knee) inward (OED, 1909); cf. to <i>knuckle down</i> to kneel (EDD ^{III})	Ø	Cf. the protuberant part of any joint (EDD ^{III})	< Middle Eng. <i>knakel</i> 'knuckle' from a source akin to Middle Low Germ. <i>knōkel</i> 'knuckle' < PG * <i>kn-u-k-</i> < * <i>g(e)n-</i>

Sources: Oxford English Dictionary (OED), New Shorter Oxford English Dictionary (NSOED), The English Dialect Dictionary (EDD); The American Heritage Dictionary of Indo-European Roots (AHDIER); Encyclopedia of Indo-European Culture (EIEC)
[Ø = meaning unattested]

2. Backtracking from Modern English to PIE: 'kn- words' related to body-joints

Tracking the etymology of Modern English 'kn- words' of Germanic origin related to body-joints back through Old English (OE) and Proto-Germanic (PG) to Proto-Indo-European (PIE), is not an easy enterprise. This is due not only to the dearth of data, but also because an analysis of the evolution of these words poses many of the classic difficulties met with in determining the exact nature and degree of semantic and lexical relatedness, including monosemy, polysemy, homonymy, metaphor and metonymy, as well as that of linguistic change in general. What does seem clear

however, at the risk of cutting a long story too short, is that, if we follow Watkins (2011: 26-27), all the English 'kn- words' in table 1 except *knee* (< PIE **genu-* [oldest form **ĝenu-* 'knee, angle']) derive, through PG, from one and the same form, namely **g(e)n-*, a "Hypothetical IE base of a range of Germanic words referring to compact, knobby bodies and projections and sharp blows." This base, listed in Mallory & Adams (1997) as **gen-* '± to compress' and dubbed a "pseudo-root" (1997: 451), furnishes, when enlarged, several derivatives of a "semi-onomatopoetic" (*sic*) nature, mainly in Germanic. Apart from being a good example of using one 'kn- word' (*knobby*) to define other 'kn- words', Watkins' reconstruction of the 'meaning'² of this root in *AHDIER* is a nice illustration of the caveat that he formulates thus:

It is perhaps more hazardous to attempt to reconstruct meaning than to reconstruct linguistic form, and the meaning of a root can only be extrapolated from the meanings of its descendants. " [...] [W]ith the passage of several thousand years the different words derived from this [i.e. any given] root in divergent languages have undergone semantic changes that are no longer recoverable in detail. (2011: xx)

Now in his *Études prégrammaticales*, Cuny (1924) affirms that **-u-* in **ĝenu-* is suffixal, and motivates it by linking it to PIE **dwo-* 'two':

dwo* (ou même **do*) signifiait "deux" par lui-même, et ce n'est qu'en sa qualité d'un nom d'un nombre *pair* que la langue lui attribuait, *ad libitum*, l'indice *-w* [...]. Ceci laisse à présumer que *-w* (et ses formes alternantes : *-we*, etc...) n'était à l'origine qu'une sorte de "classificateur" pouvant "signaler" les noms *pairs* de personnes, d'objets et de nombres [...]. Aussi s'explique-t-on que beaucoup de noms de parties *paires* du corps et d'objets allant *par paires* soient des thèmes en *-u-* (*-ū-*). C'est ainsi qu'on a, p. ex. : [...] got. *kniu* (gnew-o-m*), etc... "l'un des deux genoux". (1924: 25, 26).

Whether this is accepted or not, the full-grade *CéC-* form of both of the above roots (see Benveniste 1935, chap. IX) seems to have been identical (**gen-*) even though the velar stop **g-* in **genu-* is reconstructed as a palatal in its oldest form (**ĝen-*). If so, and simplifying to some extent, the semantic relation between them may be construed either as homonymic (i.e. two roots having the same form but differing in 'meaning' in a given state of the language (**gen(-u)-* 'knee'/hypothetical **gen-* '± to compress; compact, knobby bodies and projections and sharp blows'), or as polysemic (i.e. one root displaying a range of different 'meanings' in a given state of the language). However, if we assume that body-parts such as the knee(s) and the elbow(s) were among the "compact, knobby bodies" denoted by derivatives of hypothetical **gen-* in IE –not unreasonably, since Watkins derives both *knob* 'point/joint of the elbow' and *knop* 'kneecap, elbow-joint' from this root–, it becomes conceivable that at some early stage of PIE, **ĝen(-u)-* 'knee' and **gen-* '± compress; compact, knobby bodies...' were cognates.

If this is so, then one can reconstruct a proto-root **gen-* (arguably **ĝen-* in its oldest form) '± body-joint; body-joint actions', some of whose nominal derivatives denoted the 'knee(s)', others the 'elbow(s)', and yet others, knobby parts of the body such as the 'knuckle(s)' of the fingers and toes (cf. dialect Eng. *knob* 'toes' and *knot* 'knuckle'). That this proto-root also furnished derivatives which denoted body-joints other than those attested in Modern English, and which were subject to semantic broadening (by generalization) or narrowing (by specialization), may be surmised notably from dialect English *knot* 'the top of the head', but also 'the nape or back of the neck' (the head being "joined to the trunk by the neck", *OED*), and from Modern German *Knocken* 'bone' and

Knöchel 'ankle, finger-knuckle'. Even more importantly, that the hypothesised proto-root in question served as a base for derivatives denoting actions linked naturally or culturally to the knees (for instance), is also conceivable, as noted in Philps 2009 (§4):

In the early part of the 20th century, certain scholars put forward the hypothesis that **ĝenu-* 'knee' is cognate with **ĝenh₁-* 'to beget a child, be born' or even **ĝneh₃-* 'to know, recognize'. For instance, Loth points out that in Irish, *glúinighim* (v.), derived from *glún* 'knee', means 'I beget', and that in other Indo-European and non Indo-European languages, there is "converging evidence that proves that the two meanings of the word *genou* ['knee'] had a very different origin in prehistoric times [...]. In those days, a woman would give birth while sitting on her husband's knees, the husband thereby acknowledging that the child was indeed of his own blood and that it would become part of his family. Subsequently, the mere act of the father sitting the child on his lap came to have the same meaning". (1923: 145, my translation)

To return to Watkins' reconstruction of the 'meaning' of the hypothetical IE base **g(e)n-*, it should not be forgotten that this comprises the expression 'sharp blows'. Now if this root furnished nominal derivatives denoting body-joints such as the elbow(s), seemingly continued by dial. Eng. *knap*, *knob*, *knop*, the knee(s), apparently continued by dial. Eng. *knop* 'kneecap', and the knuckle(s), possibly continued by dial. Eng. *knot*, then it is conceivable that it also gave rise to verbal derivatives (cf. *knee* (n., c825)/*knee* (v., 1892), and *knuckle* (n., c1375)/*knuckle* (v., a1793, OED). As can be seen, these verbal derivatives are systematically attested at a (much) later date than the corresponding nominals; however, we cannot safely draw any parallel conclusions from this about their relative chronology in PIE.

Furthermore, given the incidence of *aktionsart* on verbal predicates, it would seem linguistically plausible that verbal forms of 'kn- words' denoting body-joint actions, e.g. *knee* (v.) 'to strike or touch with the knee' and *knuckle* (v.) 'to tap, strike, press, or rub with the knuckles' (OED), should also be able to denote the *consequences* of such actions, including the sounds made when they are performed (i.e. a 'form/function/fruit' relation). And indeed, the OED lists *knap* (v.¹) 'to strike with a hard short sound; to knock, rap', *knee* (v.) 'to strike or touch with the knee', and *knuckle* (v.) 'to tap, strike, press, or rub with the knuckles'. Also, there is faint evidence that some manifestations of *aktionsart* in Modern English may already be present in apparently non-cognate PIE roots, e.g. Eng. *meal* 'the edible part of any grain or pulse ground to a powder' (OED) < **melh₂-* 'to crush, grind'/*small* (in the sense of 'composed of fine or minute particles' (OED), possibly as a result of crushing or grinding) < **(s)meh₁lo-* 'small (animal)', an **s-* mobile root which also attests **m-* in the *C₁-* slot (see section 4 for core invariance in *C₁-* position in PIE).

Now, still with reference to the subset of 'kn- words' in table 1, PIE voiced stops in root-initial (**C₁-*) position regularly became voiceless stops in PG by Grimm's Law (Collinge 1985: 63-76), e.g. **ĝ-* in the PIE root noun **ĝónu* ~ **ĝnéw-* 'knee' > PG **knewā* (Ringe 2006: 99), or **g-* in hypothetical **gen-* '± to compress; compact, knobby bodies' (> PG **kned-*). Furthermore, although PG often appears to continue base II (CCé-) forms of its PIE ancestors (e.g. **knewā* 'knee' < **ĝenu-*), or possible ancestors (e.g. **kned-* 'to knead' < hypothetical **gen-*), there is no reason to suppose that it did not also continue the (canonical) base I form *CéC-*, hence furnishing both **knV-* and **ken-* root forms (see Benveniste 1935: 150, and section 5).

Now according to *ADHIER*, **ken-* is notably the hypothetical base of two similar Germanic roots, **hnekk-* 'neck' (> Mod. Eng. *neck*) and **hnukk-* 'sharp projection, tip' (> Mod. Eng. *nock*), a base which Mallory and Adams assimilate, like **gen-* '± compress...', to a "pseudo-root" (1997: 451). Listed too in *ADHIER* and *EIEC* is the enlarged PIE root **kenk-* 'heel, hock, bend of the knee' (> PG **hanhila* > OE *hēla* 'heel' > Mod. Eng. *heel*), which also furnishes sparsely attested OInd. *kankāla-* 'bone, skeleton', whose 'meanings' may constitute further evidence of the semantic broadening and narrowing already seen in Modern German 'kn- words'. The fact that dialect English *knot* 'the top of the head' also has the meaning of 'the nape or back of the neck' (*EDD^{III}*) provides further grist for the hypothesis that PIE **ĝenu-* 'knee' and hypothetical IE **gen-* '± compress; compact, knobby bodies...' were originally cognate, and that there once existed a proto-root **ĝen-* '± body-joint; body-joint actions' with reflexes denoting perceptually salient body parts characterized by combinations of abstract anatomical properties such as jointedness, angularity, boniness and, prototypically, symmetry, including the knee(s), the elbow(s), the knuckle(s), but also the neck.

3. The {kn-, body-joint} relation: from linguistic semantics to embodied semantics

From the point of view of linguistic semantics, it seems possible to analyse the above-hypothesized **ĝen-* '± body-joint; body-joint actions' proto-root as either monosemic, if it is reasoned that its nominal derivatives all had the anatomical sense of '± articulated, protuberant, bony, body part', or polysemic, if it is held that nominal derivatives that denote different parts of the body anatomically must be considered as having different meanings. And, of course, much work has been devoted to this theoretical issue (see Ruhl 1989, for instance). However, in recognition of the fact that the notion grounding the {kn-, body-joint} relation under study is, *ipso facto*, a bodily one, I claim that another approach to this relation which can no longer be ignored is provided by the cognitive theory known as embodied semantics (see Gallese & Lakoff 2005). This theory postulates that conceptual knowledge is mapped within the human sensory-motor system, thereby entailing that conceptual representations accessed during linguistic processing include sensory and/or motor representations related to the concept in question. One of the possible upshots of this postulate is that linguistic patterning may invariantly encode mental patterning of our experience, including, I submit, proprioceptive experience of our own body. As the neuroscientist Damasio suggests:

Primordial representations of the body proper in action would offer a spatial and temporal framework, a metric on which other representations could be grounded. The representation of what we now construct as a space with three dimensions would be engendered in the brain, on the basis of the body's anatomy and patterns of movement in the environment. (1994: 235)

Damasio calls the dynamic, ever-changing representations constructed in the brain which reflect changes inside and outside the body "brain maps". A particular type of the latter he specifically mentions is proprioceptive maps, one of whose source objects is constituted by mental images of body-joints (2010: 76). He goes on to state that:

When skeletal muscles are connected to two bones articulated by a joint, the shortening of their fibers generates movement. [...] Whenever those contractions occur, the configuration of the body changes. Except for moments of complete immobility, which are infrequent in the awake state, the configuration of the body

in space changes continuously, and the map of the body represented in the brain changes accordingly. (2010: 95)

Now it has already been seen that in the subset of 'kn- words' under study, all the members have meanings referring to a common underlying 'notion', since they all refer to articulated body-parts, or the actions performed by such parts, and only to these. In order to analyse this phenomenon, I shall construe a 'notion' as a cognitive entity, which I equate with what Lakoff & Johnson (2003: 252) call a 'domain', noted between slashes, i.e. a topologically structured conceptual space characterized by sets of quantitative and/or qualitative properties allowing cross-domain inferences. Notions such as that of 'body-joints' associated with *kn-* in one subset of 'kn- words' may best be analysed, I claim, according to principled criteria such as prototypicality and periphery, thereby transforming them into 'notional domains', i.e. categorially constructed conceptual spaces characterized by sets of quantitative and/or qualitative properties to which a metric may be applied (Culioli 1990: 69). Such domains, or complexes of structured physico-cultural properties, are topologically constrained, in that they can be identified in terms of an interior (I) and an exterior (E) separated by a boundary (B). Moreover, they may be organized hierarchically on the basis of dimensional and other relational criteria.

If the 'kn- words' in table 1 are analysed within a theory of conceptual mapping such as that propounded by Lakoff & Johnson (2003), there appears to emerge a process which may be referred to as cognitively driven source-to-target body mapping. It will be assumed that the source domain of the mental projections posited is that of /body-joints/, including prototypically, but not exclusively, the knee(s), the elbow(s), and the knuckle(s). This assumption is based on the etymological grounds that the corresponding meanings of the linguistic items concerned are systematically the earliest recorded ones (*knee*, c825, *knop*, a14., and *knuckle*, c1375, *OED*), and on the psychomechanical principle of notional chronology, which is relative "not to a sequence of events to be signified momentarily in discourse, but to an abstract sequence, *between ideas*, which becomes established permanently in tongue (Fr. *langue*), prior to the onset of discourse" (Guillaume 1964: 189, my translation).

If this principle is deployed within a modern cognitive framework, it may first be noted that body-part words such as *knee* are self-referential, in that they allow the speaker to refer to his/her own body propositionally. Hence, the meaning potential of self-referential words such as those deriving from PIE **ǵenu-* 'knee, angle' must include all the formal, functional, compositional and relational properties, i.e. the abstract, perceptually grounded, possible features assignable to the cognitive (sub-)domain 'knee'. Under prototypical conditions of human experience, these include inherent properties of various orders such as 'animacy', 'agency', 'cyclicity', 'inalienability', etc., as well as relational properties such as 'symmetry', 'duality', 'orientation', and 'contiguity'. Some of the latter, for example location and distance (cf. the dictionary definition of *foot*: 'the lowest part of the leg beyond the ankle-joint', *OED*), clearly rest on the perception by the mind, itself situated at the upper extremity of the human body, of the lower, peripheral position of the referent relative to it.

Now if the Guillaumian principle of notional chronology is applied here, it appears that the body-joint notion of 'knee' vectored by PIE **ǵenu-* 'knee, angle' must logically be *prior* to that of 'angle' since if derivatives of this root can also denote "something resembling the knee in position or shape" (e.g. Mod. Eng. *knee*), then the naming

process underpinning the sense of 'angle' is necessarily analogical, in which case it involves the inferential projection to a target domain of the abstract properties of a *pre-existing mental model* (or source domain from which these properties are extracted), namely that of the 'knee(s)'. Whether hypothetical IE **gen-* '± compress; compact, knobby bodies' was originally cognate with **genu-* 'knee, angle' or not, the same reasoning can presumably be applied to its derivatives. For example, Mod. Eng. *knuckle* can denote both 'the bone at a finger-joint...', first attested c1375, and 'something shaped or protruding like a knuckle of a bone' ['a thickened joint of a plant, a projecting bend of the intestine', etc.], first attested in these senses from 1601 onwards (OED). If this is so, then just as the body-part meaning of *knuckle* is etymologically prior to that of 'a thickened joint of a plant', etc., so must the body-part notion of 'knuckle' be logically prior to that of 'joint of a plant', etc., assuming that the latter is analogically based.

To return to conceptual mapping within the domain of the human body, this appears to involve metaphonymy (the interaction of metaphor and metonymy, see Goossens 1990), since a word such as *knop* (n., dial.) can denote both the kneecap and the elbow-joint, and *knob* (n., dial.) the elbow-joint and the toes. However, the direction of the mapping cannot always be ascertained for want of relevant data. For example, while the denotative meaning of *knee* throughout the history of English, whether dialectal or standard, appears to be that of 'the joint, or region about the joint, between the thigh and the lower leg' (OED), to the exclusion of other body-joints, it is not possible to establish which of the body-joint meanings attested by *knop* in Late Middle English ('the rounded protuberance formed by the front of the knee or the elbow-joint', OED) is the earlier, thus rendering hazardous judgments as to the possible direction of mapping.

Although one may appeal to universal transfer patterns such as the "top-down strategy", which posits that mapping generally proceeds from upper to lower parts of the human body (Heine 1997: 134-136), this may be tempered by the consideration that, given its power of generalization, the core invariant <kn-> in the subset of 'kn- words' under study may initially have had the potential to encode various body-joints submorphemically, in which case *knee*, *knop*, *knuckle*, etc., would merely represent particular instantiations of this potential, each with its own, conventionally determined meaning(s) at a given stage in the evolution of the English language. A counter-example to the top-down strategy is provided by a mapping from the source domain /knee/ or /elbow/ to the target domain /head/, scantily evidenced by *knob*, *knop* and *knot* 'the head', a sense which lacks secure dating in each case. These three words also supply similarly scanty evidence for the generalization of meanings denoting specific body-joints to rounded protuberances on the body as a whole, e.g. *knob* 'a swelling on the skin or on a bodily organ', *knop* 'a swelling upon the skin', and *knot* 'a swelling or protuberance in a muscle' (OED), a process often alluded to in encyclopedic definitions by the term 'any', as in (*knuckle*) 'the protuberant part of any joint' (EDD^{III}).

Lexical evidence for the conceptual mapping of body-joints from the source domain /human body/ to the target domain /animal body/ is provided, with all the caveats previously mentioned, by *knead* (v.) 'to manipulate or paw repetitively with or as with the action of (the claws of) a cat' (OED), and *knee* (n.) 'a joint in an animal likened to, or regarded as corresponding in position or shape to, the human knee' (OED). Significantly, the verb *knead* in table 1 denotes an action performed naturally by the

hands ('to massage or squeeze with the hands...'), rather than the hands themselves (*knead* (n.) 'an act of kneading; an application of pressure in massage', *OED*). However, the action in question involves movements such as pressing and stretching (dough) with the heel of the hand and knocking back (or punching down), which requires bending the finger-joints (cf. *knuckle* (v.) 'to tap, strike, press, or rub with the knuckles', *OED*).

As for mapping to the domain of /non-animates/, this is evidenced by *knee* 'something resembling the knee in position or shape' (part of a hill, tree, a natural prominence as a rock or a crag, a piece of timber having a natural angular bend, or artificially so bent, etc., *OED*), and by *knuckle* 'something shaped or protruding like a knuckle of a bone' (a thickened joint of a plant, a node, a projecting bend of the intestine, the projecting tubular part of a hinge through which the pintle runs, etc., *OED*). Once again, this assumption is based on the etymological grounds that the 'bodily' meanings of the above words are the earliest recorded ones, but also on the above-mentioned postulate of the naming of non-animate referents by analogy with certain parts of the human body.

Several of the 'kn- words' in table 1 provide evidence that conceptual mapping from the /body-joints/ domain to that of /non-animates/ appears to function by stages of outwardly directed projection. By this I mean that once a body-joint has been named, the word in question can then be used metaphonymically to denote a referent which is in physical contact with it and which, being in the speaker-hearer's peripersonal space (see Iacoboni 2009: 277), interacts directly with it by providing cover or protection, for instance. Once this has been accomplished, the word in question can be extended metaphorically to denote a referent that is located outside peripersonal space. To take an example, once the 'kn- word' *knee* had come to denote 'the joint, or region about the joint, between the thigh and the lower leg' (putatively by metaphorical projection from the domain /jaw(s)/ – see section 4), it could have been extended to denote, peripersonally, 'the part of a garment covering the knee' before being extended beyond this space to denote 'something resembling the knee in position or shape' (*OED*).

Another 'body-joint' example is provided by *heel*, which can ultimately be traced back to PIE **kenk-* 'heel, hock, bend of the knee',³ a possible cognate of hypothetical **gen-* '± to compress'; compact, knobby bodies' (> PG **knuk-* > Eng. *knuckle* (v.)), one of whose meanings is 'to bend (the knee) inward'. In Modern English, this word can mean 'the projecting hinder part of the foot, below the ankle and behind the hollow of the foot', but also, peripersonally, 'the part of a stocking that covers the heel' and, beyond peripersonal space, 'a part of a thing which has the position or shape of the human heel' (*OED*). On a universal scale, this is a very powerful mapping technique, since, being body-based, it provides a naming strategy of which all humans can potentially (though not necessarily) avail themselves, and thereby grounds understanding in a form of shared, embodied knowledge.

Furthermore, it would seem that the hypothesized strategy of naming bones (human or animal, living or dead, articulated or disarticulated) and the body parts with which they are associated by means of the unconscious, self-referential use of oral or laryngeal occlusions is encoded submorphemically not only in the putative core invariant <*ĝ-> in PIE **ĝenu-* 'knee, angle' and <*g-> in hypothetical **gen-* '± compress; compact, knobby bodies', but also in several apparently unrelated roots whose core invariant is posited to be <*k-> (or <*h₂-> in the case of **h₂ost-* 'bone'), e.g.:

**kost-* 'bone' (> Lat. *costa* 'rib' > Mod. Eng. *costal* 'pertaining to the ribs'), possibly related in some, debatable way to **h₂ost-* 'bone'⁴ (> Gk. *astragalos* > Mod. Eng. *astragalus* 'vertebra, ball of the ankle-joint, knucklebone')

**skeh₁i-* 'to cut, split' (> Old Eng. *scinu* 'shin, shinbone' > Mod. Eng. *shin*)

**skeng-* 'crooked' (> Old Eng. *sc(e)anca* 'shinbone' > Mod. Eng. *shank*)

**skelh₁-* 'to parch, wither' (> Gk. *skellesthai* > Mod. Eng. *skeleton*)

*(*s*)*kep-* 'to cut, scrape, hack' (> Lat. *scapula* > Mod. Eng. *scapula* 'shoulder blade', ADHIER).

Although appropriate data, methodology and theoretical tools of analysis are presently lacking, there is undoubtedly a massive, and as yet largely uncharted research field to be opened up here in a multidisciplinary perspective (sublinguistics, cognition, language emergence and evolution, neurophysiology, symbolism, archaeology, paleontology, lithic technology, musicology, etc.).⁵

4. Backtracking from PIE to the emergence of the linguistic sign

Backtracking invariant submorphemic relations linguistically from Modern English can only take us back with any degree of safety to the partially reconstructed state of language known as PIE, some 6 to 8,000 years ago according to Mallory & Adams (1997: 583-587), a very shallow time-depth in terms of the still indeterminable period when articulated human speech began to emerge. As concerns the dyadic {*kn-*, body-joint} relation under study here, it can be traced back by accepted methods of linguistic reconstruction to Proto-Germanic, e.g. Mod. Eng. *knee* < OE *cnēo(w)* < PG **knewA*, or Mod. Eng. *knead* < OE *cnedan* < PG **kned-*). Backtracking even further, PG **kn-* in these roots appears to continue PIE **gn-*, zero-grade of the canonical shape **gen-*, of which the oldest reconstructable form, as noted previously, is **ĝen-* in the case of *knee* (< **ĝenu-*).

Now there is some evidence that in PIE, the root-initial consonant in the canonical C₁-shape, which I shall transcribe as C₁-, functions as a 'core invariant' to which a notion common to two or more roots can be attributed submorphemically on structural grounds (see section 1 above), and the root-final consonant in this shape, which I shall transcribe as C₂-, as a variable. This evidence is provided by root-final *-l-/*-r-alternation in PIE (Benveniste 1964: 25) attested in root pairings which vector identical notions, e.g. **gal-*/**gar-* 'to call, shout', **ĝhel-*/**ĝher-* 'to shine', **ghel-*/**gher-* 'to call (out)', **pel-*/**per-* 'to strike', *(*s*)*kel-*/*(*s*)*ker-* 'to cut', and **wel-*/**wer-* 'to turn', and, less tellingly, by root-final voiced/voiceless alternation, e.g. **peig-*/**peik-* 'to cut, mark' and **ĝebh-*/**ĝep(h)-* 'jaw, ± eat'.

I have posited elsewhere (Philps 2005: 7) that in root-final position, *-l- and *-r- may have been one single protophoneme (*-R-) prior to PIE, with *(*s*)*kel-* and *(*s*)*ker-* 'to cut', for example, being reflexes of a hypothetical *(*s*)*keR-*. It may be noted that there are a few examples of root-initial (*C₁-) alternation such as **g-*/**k-* in **gem-*/**kem-* 'press, squeeze (together)', in which the invariance displayed by C₂- does not allow us to establish which consonant, if either, vectors the notion common to both roots submorphemically. This and other similar pairings may be partly explained (although much depends on the relative chronology) by a possible early onset of Grimm's Law by which, as already noted, PIE voiced stops in root-initial (*C₁-) position regularly became

voiceless stops in PG, especially as the roots in question are both attested in families mainly located in the west and centre of the IE world, including Germanic.

However, by reconstruing the static manner feature [+occlusive]⁶ characterizing a large number of PIE phonemes in *C₁- position as a dynamic, articulatory gesture ([+occlusion]),⁷ we may speculatively retrace this feature as far back as is permitted by gestural theories of the emergence of articulated speech in *homo sapiens* –necessarily more than 100,000 years ago according to Nichols (1992), and doubtless an order of magnitude older than that– such as the neo-Darwinian frame/content account propounded by MacNeilage (2008). Can one assume that the dynamic gesture of occlusion which may have evolved linguistically into the static feature [+occlusive] in certain PIE phonemes in *C₁- position did remain stable during the considerable period of time that must have elapsed between the emergence of articulated speech and PIE, typologically a fully-fledged language in its own right? Clearly, without empirical evidence, this assumption must rest on theoretical stances. One of those which pleads in favour of such stability is that adopted by MacNeilage, for whom speech evolved from biphasic cycles, i.e. two alternating movements in each of the three subsystems used by humans for vocalising: respiratory (inspiration-expiration), phonatory (close-open cycle of the vocal folds), and articulatory (modulation of the close-open cycle in the vocal tract). He argues that “the motor frame cycle underlying the syllable, produced by oscillation of the mandible, may have initially been borrowed from the ingestion domain, where it is used by all mammals for chewing, sucking, and licking”, adding that eventually, “the mandibular cycle underlying the close/open alternation of the mouth became consistently paired with vocal-fold vibration to form the first syllables”. (2008: 58).

If this is the case, then there are clear grounds for the postulate that the feature [+occlusive] characterizing oral (or nasal) stops in the hypothesised core invariant (*C₁-) position in several PIE roots related to the notion of chewing or biting, e.g. *ġ- in *ġebh-/ *ġep(h)- ‘jaw, ± ‘eat, masticate’, *h₁- in *h₁ed- ‘to eat, original meaning “to bite”,⁸ *gh- in hypothetical *gh(e)n- ‘to gnaw’, and *m- in *mendh- ‘to chew’, is a vestige of the biphasic, mandibular oscillation resulting in close/open alternation of the mouth from which, according to MacNeilage, articulated speech may have evolved in modern humans. Accordingly, the postulated core invariant <ġ>- in *C₁- position in PIE roots such as *ġebh-/ *ġep(h)- ‘jaw, ± eat, masticate’ or *ġenu- ‘jawbone, chin’ (whose denotatum is the mandible, attached to the temporal bone by the temporomandibular joint) would have evolved morphogenetically from its purported iconic origins (in the sense of Peirce 1991: 251) to the status of a linguistic sign by syllabification (*ġ- > *ġV-, see Hurford 2003: 53), consonant incrementation (*ġV- > *ġVC-, see Southern 1999: 152), reduplication (see Watkins 2011: 37 for *kak(k)a- ‘defecate’, apparently “imitative of glottal closure during defecation”), and, conceivably, suffixation (see Cuny (1924: 26) for *ġVn- > *ġVn-u- ‘knee’).

Now a major postulate of the semiogenetic theory of the emergence and evolution of the linguistic sign (STEELS) outlined initially in Philps 2000 (semiogenesis being construed as the study of the evolution of non linguistic semiotic behaviour such as gesture into linguistic behaviour) is that early *homo sapiens* unconsciously started to use goal-oriented, non linguistic gestures involving biphasic closing and opening of the mouth both self-referentially and mimetically. According to STEELS, this would have seen the emergence of speech in *Homo sapiens* pass through a phase during which the

shapes, movements and functions of the organs of speech were empathically imitating the shapes, movements and functions of other parts of the human body articulatorily. This in turn would have instilled a degree of goal-oriented, analogically-based iconicity into the modulated, consonantal-vocalic sound patterns thus produced which would gradually have receded as linguistic processes, convention, and sociocultural factors became predominant.

The self-referential nature of mimesis, construed as an analogue mode of communication that brings into play the whole body as an expressive device, has been noted by Donald, who suggests that:

A vocalization channel would have been a very effective way to disambiguate a mimetic visual channel, without interfering with it. Initially, this would have been in the form of vocomimesis, with a specialized subsidiary role in mimetic communication, as a distinct disambiguating submodality of mimesis. (2001: 291)

Let us take as an example of the possible evolution of non linguistic gestures into prelinguistic ones the action of mastication, which involves repetitive sequences of close-open movements of the jaws, each of which can be broken down physiologically into three phases: an opening phase during which the mandible is depressed, a closing phase during which the mandible is raised towards the maxilla, and an occlusal phase during which the mandible is at rest. Now feedback from proprioceptive nerves in the temporomandibular joints relative to the movements and resonances engendered by mastication is transmitted to the brain, where it is organized somatotopically, insofar as its cortical activations correspond to overlapping motor representations of different body parts, postures and movements, including those of the oro-facial region (Brown et al. 2009). I have reasoned, therefore, that in early forms of oral communication, *homo sapiens* may originally have construed these plosive resonances interactively as *referring back* to the movements of the articulators in question and the articulators themselves.

If this is so, then the latter would have been referred to and understood by speaker-hearers both metonymically, i.e. an occlusive resonance *for* an occlusal action or for the effector(s), and simulatively, i.e. an occlusive resonance *as if it were* the action or the effector(s) (for sensory-motor simulation, see Creem-Regehr 2010). This hypothesis, which rests crucially on the human propensity for imitation, is accredited by the recent discovery of mirror neuron systems located in the zone of the brain known as Broca's area. Mirror neurons, a special type of neuron which becomes active during verbal activity and oro-facial, brachio-manual and oro-laryngeal movements in general, fire selectively not only when a human performs a goal-oriented action, but also when it observes another human performing a similar action (see Rizzolatti & Sinigaglia 2008).

Even before this plosive resonance was putatively integrated as a voiced oral stop into a linguistic sign such as PIE **ǵenu-* 'jawbone, chin', arguably by a sequence of morphogenetic processes involving syllabification (**ǵ-* > **ǵV-*), consonant incrementation (**ǵV-* > **ǵVn-*), and suffixation (**ǵVn-* > **ǵVn-u-*), it may have been used to refer to the 'knee' by a somatotopically-driven process of conceptual projection within the body domain. This projection would presumably have been motivated by the unconscious perception that the two domains in question, i.e. the jaw(s) and the knee(s), share certain topological properties such as protrusion, angularity and symmetry, kinetic ones such as applied forces, mechanical ones such as jointedness and oscillation (extension-flexion in the case of the knee, close-open in the case of the upper and lower jaw), and compositional ones such as boniness. Whatever the case, certain Indo-Europeanists have already suggested that **ǵenu-* 'jawbone, chin' and **ǵenu-*

'knee, angle', usually seen as homonymic, are linked by a common notion. Referring to **ġenu*- 'jawbone, chin', Buck, for instance, proposes that an "Orig. sense 'jaw' and ultimate connection with the word for 'knee', IE **ġenu*- (neut.), Grk. γόνυ, Lat. *genū*, etc. [...] through some common notion like 'angle', is probable". (1949: 221). This proposal is also put forward by Mallory & Adams: "**ġónu*- (gen. **ġénus*) 'knee'. [...] Most probably related to **ġenu*- 'chin, jaw', both being sharply angled parts of the body". (1997: 336).

5. Conclusions

In conclusion, what I claim here, based on the above analysis, is that PIE **ġenu*- 'knee, angle' and **kenk*- 'heel, hock, bend of the knee' (> PG **hanhila* > Mod. Eng. *heel*), but also hypothetical IE **ġen*- '± compress; compact, knobby bodies' (> PG **knuk*- > Mod. Eng. *knuckle*) and **ken*- (> PG **hnekk*- 'neck' > Mod. Eng. *neck*) all derive, by linguistic processes accounted for by Grimm's Law and PIE root shape theory, from a putative proto-root **ġen*- '± body-joint; body-joint actions'. A combination of several diachronic factors may explain why the four roots in question have not previously been seen as cognate (to my knowledge). These would include diversification in morphological shape (base I (CéC-)/base II (CCé-)), consonantal root enlargement (CéC- > CéCC-), possible suffixation (CéC- > CéC-u- in the case of **ġenu*-), variation in phonetic shape (palatal **ġ*-/velar **g*-), as well as devoicing, and possible later fricativisation, of root-initial voiced stops between PIE and PG (**g*- > **k*- [>**h*-]). Added to this is the possibility that putative **ġen*- may have furnished reflexes capable of denoting different body-joints, such as the jaw(s), the knee(s), the knuckle(s), and the elbow(s), which would have tended to blur their possible common origin, thus leading them to be treated homonymically rather than polysemically in etymological or lexicological works, as well as in linguistic semantics.

As for Loth's (1923) suggestion that PIE **ġenu*- 'knee' is cognate with **ġenh₁*- 'to beget a child, be born' and even **ġneh₃*- 'to know, recognize' (see section 2), it provides, if correct, an interesting illustration of how reflexes of putative **ġen*- '± body-joint; body-joint actions', could have been mapped naturally to the 'knees', arguably by metaphorical projection from the domain /jaws/, before taking on more culturally motivated meanings. Whereas the root noun **ġenu* would have denoted the knee(s) anatomically, the verbal root **ġenh₁*- 'to beget a child, be born' would presumably have originally vectored the notion '± to bend the knees so as to give birth to a child', and **ġneh₃*- 'to know, recognize', base II of sparsely attested **ġenh₃*-, that of '± to sit a child on one's knees so as to recognize paternity'. If this were the case, then the importance of *aktionsart* in PIE once again emerges, and in particular the ability of one and the same putative proto-root to furnish derivatives denoting not only goal-oriented, telic verb events, but also the result, or consequence, of these events (cf. Mod. Eng. *cut* 'to make incision in or into', but also 'to make a narrow opening through (a dyke, etc.), or through the bank of (a canal), so as to let the water escape' (OED, my emphasis).

On a mythological level, I have noted elsewhere (Philps 2009: §7) that Onians, evoking both Aristotle, for whom "boys maimed in their sexual organs are sterile (ἄγονοι) so that they do not get a beard (γεβεῖαν) but continue as eunuchs" (*De Gener. Anim.* 746 b, 21 ff), and the fact that the synovial liquid in the knee was classed with the cerebrospinal fluid or liquefiable substance, the fluid of life, and thought to contribute to the

seed, proposes the following explanation for the apparent connection between the jaw, the knees, and generation in prehistoric times:

This evidence suggests what does not appear to be recognised, that the jaw like the knee was associated with generation and that the other names of the chin or jaw, γένυς and γένειον (cf. γενηιάς, 'beard', Latin *gena*, German *Kinn* = chin, A.S. *cinn*, etc.), were related to γένος, γενεά, *genus*, *Kind*, 'kin', etc., expressive of generation. (1988: 233)

Another process already under way in PIE that comes into focus, both cognitively and linguistically, is that of decorporealisation, or 'body bleaching', a term I use to refer to a gradual desemanticisation of the body image conveyed by a word over time as its original meaning generalizes or specializes, notably by focusing either on the verb event itself (arguably, in the case of **ĝenh₁-*, '± to bend the knees so as to give birth to a child' > 'to give birth to a child' > 'to give birth'), or on the goal or result of the verb event (arguably, in the case of **ĝneh₃-*, '± to sit a child on one's knees so as to recognize paternity' > 'to recognize paternity' > 'to recognize'). This process, which, if protracted, may result in various degrees of grammaticalisation, is also visible in English, as exemplified by the earliest definition of *have* (v.) 'to hold in hand, in keeping, or possession', a sense first recorded in 814 (*OED*), as against the later definition of 'to hold or possess, in a weakened sense' (c1000). Furthermore, it is paralleled isomorphically by a process that might be termed 'phonetic bleaching', insofar as the occlusive component of PIE *<*ĝ->* (or *<*g->*), gradually disappears between PIE and Modern English by devoicing (**ĝ-/g->*k-*) and possible fricativisation (**k->*h-*) between PIE and PG, followed by its eventual disappearance in English 'kn- words' (schematically, [k] in word-initial [kn] > [øn] between Early Modern and Modern English). Notwithstanding the fact that [n] is a nasal stop, this phonetic evolution has thus 'bleached out' of the 'kn- words' under discussion any trace of the occlusive gesture posited to have originated semiogenetically when articulated speech began to emerge.

Finally, on an epistemological note, the above stance clearly militates in favour of the hypothesis that the origins of the linguistic sign were partly iconic, and that the processes underpinning the evolution of the sign over time have resulted in it becoming ever more arbitrary, in the Saussurean sense of the term, notably by gradual loss of its purported extralinguistic motivation. Although one can always appeal to the 'chance factor' when attempting to account for the submorphemic phenomena addressed here, the apparent isomorphism between the dyadic relation {kn-, body-joints} in one subset of English 'kn- words' and the proprioceptively transmitted "brain maps" of body-joints constructed in the brain that originate within the body and represent aspects of the body in action according to Damasio, would seem to require a more powerful explanation than one involving a high degree of indeterminacy.

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ENDNOTES

1. 'Hypothetical IE base of a range of Germanic words referring to compact, knobby bodies and projections and sharp blows.' (ADHIER).
2. With reference to PIE roots, the term 'meaning' is placed between single quotation marks to recall the theoretical position that it is the *derivatives* of roots that are linguistically meaningful, and not the roots themselves, the latter being endowed with a *potential* for meaning (see Hirtle's introduction to Guillaume 1984, xii).
3. See Jóhannesson 1949: 20 for the gesturally-based language origins hypothesis that the anatomically rounded form of the heel is mimed articulatorily by a rounded movement from and back to the palate (i.e. *k- > *-k) purportedly characterizing the pronunciation of the root noun, although the latter has not itself survived (Mallory & Adams 1997: 270).
4. See Rousseau 1990, and Gamkrelidze & Ivanov 1995 (I) : 111-113, for example.
5. See d'Errico *et al.* 2003.
6. "A complete closure within the mouth during an articulation, as occurs during a plosive." (Trask 1996: 246).
7. See Browman & Goldstein (1992) for a modern theory of articulatory phonology, one which was not, however, conceived as a theory of speech origins.
8. Assuming that *h₁- was a glottal stop (cf. Lehmann 1993: 86, for example).

ABSTRACTS

I claim, within a semiogenetic theory of the conditions of emergence and evolution of the linguistic sign (STEELS), that the polysemy exhibited by Modern English 'kn- words' related to body-joints and their actions (*knead*, *knee*, *knuckle*, etc.) is a vestige of an unconscious, metonymically-based, self-referential naming strategy that may date back to the indeterminable

period when articulated speech began to emerge. The 'kn- words' in question appear to derive, via Proto-Germanic, from two Indo-European roots, namely **ĝenu-* 'knee, angle' (*knee*) and hypothetical **gen-* '± compress; compact, knobby bodies' (*knead, knuckle*, etc.). I further claim that these roots, along with hypothetical **ken-* (> Mod. Eng. *neck*) and **kenk-* 'heel, hock, bend of the knee', all derive from a putative proto-root **ĝen-* '± body-joint; body-joint actions' in which **ĝ-* appears to function submorphemically, like *kn-* in the subset of 'kn- words' under study, as a 'core invariant'. If this is so, then the dyadic sound-notion relation {*kn-*, body-joints} in Modern English can be reconstructed as a {**ĝ-*, body-joints/actions} relation in Proto-Indo-European. Lastly, I speculate that if the static manner feature [+occlusive] characterizing the putative core invariant <**ĝ-*> in **ĝenu-* 'knee, angle' and **ĝenu-* 'jaw, chin' (<**g-*> in hypothetical **gen-*) is reconstrued as a resonating, close-open, articulatory gesture ([+occlusion]), then this {**ĝ-*, body-joints/actions} relation may be retraceable in the form {± occlusive articulation, body articulators/articulations} as far back as is allowed by gestural theories of the emergence of speech, to the postulated capacity of early *Homo sapiens* for vocomimetic self-reference.

Nous affirmons, dans le cadre d'une théorie sémiogénétique des conditions d'émergence et d'évolution du signe linguistique (STEELS), que la polysémie qui caractérise les 'mots en *kn-*' de l'anglais moderne ayant trait aux articulations corporelles et leurs différentes actions (*knead, knee, knuckle*, etc.) constitue le vestige d'une stratégie de nomination auto-référentielle inconsciente fondée sur la métonymie qui remonterait jusqu'à l'époque indéterminable de l'émergence du langage articulé. Les 'mots en *kn-*' en question semblent être issus, via le proto-germanique, de deux racines indo-européennes, à savoir **ĝenu-* 'genou, angle' (*knee*) et l'hypothétique **gen-* '± comprimer; corps compacts ou nouveaux' (*knead, knuckle*, etc.). Nous affirmons également que ces racines, ainsi que l'hypothétique **ken-* (> ang. moderne *neck*) et **kenk-* 'talon, jarret, creux du genou', sont tous issus d'une possible proto-racine **ĝen-* '± articulations corporelles ; actions articulatoires' dans laquelle **ĝ-* fonctionnerait submorphémiquement, à l'instar de *kn-* dans le sous-ensemble de 'mots en *kn-*' à l'étude, comme "invariant-noyau". Si tel était le cas, la relation phono-notionnelle dyadique {*kn-*, articulations corporelles} en anglais moderne pourrait être reconstruite sous la forme {**ĝ-*, ± articulations corporelles ; actions articulatoires} en indo-européen commun. Enfin, nous postulons que le fait de reconceptualiser le trait de manière statique [+occlusif] caractérisant l'invariant-noyau putatif <**ĝ-*> dans **ĝenu-* 'genou, angle' et **ĝenu-* 'mâchoire, menton' (<**g-*> dans l'hypothétique **gen-*) comme un geste articulatoire de fermeture-ouverture doué de résonance ([+occlusion]) permet de faire remonter la relation {**ĝ-*, ± articulations corporelles ; actions articulatoires}, sous la forme {± articulation occlusive, articulateurs/articulations corporelles}, aussi loin que le permettent les théories gestuelles de l'émergence du langage articulé, jusqu'à la capacité auto-référentielle postulée des premiers *Homo sapiens* dite "vocomimétique".

INDEX

Keywords: English 'kn- words', submorpheme, core invariant, semiogenesis, body-joints/actions, self-reference

Mots-clés: "mots en *kn-*" de l'anglais, submorphème, invariant-noyau, sémiogénèse, articulations corporelles, actions articulatoires, auto-référence

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