The First "Information System": Language

Early theories: "bow-wow," "uh-oh," "pooh-pooh," etc.

1886: Linguistic Society of Paris forbids "toute communication concernante l'origine du langage" [All papers dealing with the origin of language]

More recent research on cortical features, articulatory tract, etc.
The First "Information System": Language

Was development of language gradual or sudden?

Does language presuppose neural modification?

- Language might have emerged with Homo erectus (1.5 m years)
- Or with mod. Homo sapiens (ca 100-150k years)
- Or with Upper paleolithic tool-making (ca. 40-45 k years)

Methodological difficulties:
- When does a system become "language"?
- There are no extant "primitive" languages
- Language emerges suddenly in social groups (creoles, etc.)
Types of detachable signs

3 Types of signs (after Charles Peirce):

**Index**: stands in causal/spatial relation to the signified (pawprint to bear, blaze on tree to act of marking, thermometer to temperature)

**Icon**: relation of resemblance (more-or-less) to signified. E.g,

**Symbol**: arbitrary relation of sign to signified. E.g., written word *cat*, spoken word /kæt/.

But types are often mixed in practice.
Types of detachable signs

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Types of detachable signs

3 Types of signs (after Charles Peirce):

**Index**: stands in causal/spatial relation to the signified

**Icon**: relation of resemblance (more-or-less) to signified. E.g.,

**Symbol**: arbitrary or conventional relation of sign to signified. E.g., written word *cat*, spoken word /kæt/.

But types are often mixed in practice.
The emergence of detachable signs: Tally marks

Earliest signs are mnemonics for record-keeping, geneology, etc. (Tallying systems)
Knotted rope, notched stick or bone, etc.
(Possibly) notched bones go back 400,000 years.
Become frequent in upper paleolithic

Notched Bone, England, upper paleolithic, 12,000 years old
Notched Bone, Turkey, ca 3000 BC
Notched bone, Congo, ca. 25,000 BC -- may represent lunar calendar
An elaborated tallying system: Inca Qipu (quipu, khipu)

Knots of varying colors in llama or alpaca hair;
Sequences recorded population, taxes, geneology, astronomy (and possibly names) in decimal system. System maintained by knot-keepers.

Limits: can record only quantity and category; requires extensive convention for interpretation
Beginnings of Iconic Representation

“Venus of Tan-Tan,” Morocco, possibly 250k years old, but may be a naturally occurring object.

Cave paintings, Lascaux, France: ca 15-13,000 BC (others perhaps to 30,000 BC)

Man's first affirmation of himself, and expression of his own newness--when, by the ways and means of art, he entered into contact with the power, brilliance, and joyful mastery of a force that is essentially the force of a beginning. . . ." Maurice Blanchot
Beginnings of Iconic Representation

Petroglyphs, Bhimbetka, India, ca 9000 BC

Petroglyphs, Scandinavia, Bronze Age

Rock carving, Hong Kong (Kau Sai), 3000 BC
Pictographic Communication Systems

Yukaghir (Siberia) “love letter,” late 19th c.
Ideographic (Semasiographic) Systems

"I know you're fighting with that Russian bitch you broke up with me over. I'm unhappy in my house as I think of you, but you should know there's another dude hitting on me, so get on the stick before I get married and have children, Sparky."

Note level of conventionality; but cf also a sign like 🥂
Ideographic (Semasiographic) Systems: the importance of context
Ideographic (Semasiographic) Systems: the importance of context

"Turn the key. If the car is cold, don't step on the gas pedal; if it's warm, depress the gas pedal halfway as you turn the key."
An Aside: The 10,000-year warning

Sandia Labs: warning signs to last 10,000 years for radioactive waste dumps.

DANGER
POISONOUS RADIOACTIVE WASTE BURIED HERE
DO NOT DIG OR DRILL HERE BEFORE A.D. 12,000
The 10,000-year warning
Abstraction in semasiological systems

Extending semasiological systems to deal with abstract or relational notions. E.g., "brother," "go," etc.

A step toward the development of "true" writing: Form signs for abstract entities by extending or combining signs for concrete things (ca. 3300 BC)

foot = "go, come, walk, etc." Cf use of

person + mountain = "foreigner"

eye + water = "weep" etc.
The limits of semasiographic systems

In theory, semasiographic systems could communicate a full range of information without reference to spoken language. Cf. mathematical notation:

$$10^9 = 1,000,000,000$$

"Ten to the ninth equals a billion." / "Zehn hoch neun gleicht eine Milliarde," etc.

$$\forall x \ (Fx \to Gx)$$

"For all $x$, if $F$ of $x$ then $G$ of $x"
"Everything that is $F$ is $G$," etc.

But language-independent systems appear inadequate to express the full range of thoughts & information (as opposed, e.g., to artificial languages.)
The origins of (true?) writing

Glottographic writing: rather than referring directly to reference, signs are associated with elements of the language (words, morphemes, syllables, phonemes).
Origins of Writing in Sumer

8-5000 BC -- earliest use of clay tokens.
4,000 BC -- earliest clay bullae
3500-3300 BC -- earliest clay tablets from Uruk.
Tokens as origins of Sumerian writing?

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<th>Pictograph</th>
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<th>Old Babylonian</th>
<th>New Assyrian</th>
<th>New Babylonian</th>
<th>English</th>
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Origins of Writing in Sumer

2500 BC -- cuneiform “true” writing
2400 BC script used for Akkadian
2000 BC script used for Babylonian & Assyrian..
1750 BC Code of Hammurabi
Origins of Writing in Sumer

Epic of Gilgamesh

He who saw everything in the broad-boned earth, and knew what was to be known
Who had experienced what there was, and had become familiar with all things
He, to whom wisdom clung like cloak, and who dwelt together with Existence in Harmony
He knew the secret of things and laid them bare. And told of those times before the Flood
In his city, Uruk, he made the walls, which formed a rampart stretching on...

Epic from ca. 1500-1750 BC, existing tablets from 600 BC in Akkadian...
Functions of Early Writing

Writing develops as memorial tool -- things that are hard to remember...

Commercial records
Calendars & dates
Functions of Early Writing

Writing develops as memorial aid -- things that are hard to remember...

- Commercial records
- Calendars & dates

Or that have to be said just so:

- Titles
- Laws
- Liturgical texts
- Poetry
"Complete" glottographic system: signs denote words of the language
The Rebus Principle

Rebus: Icons of things that stand in for their (phonetic) names
"canting" -- seal of the Borough of Conleton (Cheshire) = CONger, LEO, TUN
Rebus principle leads to logography

Rebus principle allows signs to be reutilized to signal abstract words, functional elements, etc.

“water” /\a/ → “in” /\a/

“oracle” /me/ → plural suffix /-me/

Accompanied by increasing conventionalization of signs...
Creates need for “determinative” signs to indicate how other signs are being used.

Eg. “marsh plant” (/te/) sign also used for name of goddess assoc. w. marshes /eresh/ -- /u/ “plant” used to indicate “marsh plant” use of sign.
Logography to Syllabic System

Logographs ultimately perceived as having purely phonetic value.

Cf English logographs -- imagine the word *h@b&*

Signs come to stand in for syllables.

Sumerian has (C)V syllable structure.

Sumerian mixture of logographic & syllabic, like modern Japanese.
Development of Written Symbols

Semasiographic/ideographic
Development of Written Symbols

Simplification of sign

Semasiographic/ideographic

Proto-writing

Rebus extension
Development of Written Symbols

Simplification of sign

Semasiographic/ideographic

Proto-writing

Rebus extension

"True" (glottographic) Writing

logographic
Development of Written Symbols

Simplification of sign

Semasiographic/ideographic

Rebus extension

Proto-writing

"True" (glottographic) Writing

[εlvIs] /ɛl/ logographic syllabic
Development of Written Symbols

Simplification of sign

[εlvIs] /έ/ /ε/

Proto-writing

Semasiographic/ideographic

Proto-writing

Rebus extension

Logographic

Syllabic

Alphabetic

"True" (glottographic) Writing
... but not much evidence for a single source (monogenesis)
Origins of Alphabetic Writing

Alphabetic system derived from application of syllabic system to different phonological structures.

- Logographic: mod. Chinese, Japanese (mixed)
- Syllabic: Linear B, Cherokee, Korean Hangul (featural)
- Alphabetic: Roman, Cyrillic, Gk, Hebrew, etc,
The abstractness of alphabetic systems

Cf distinct sounds signaled by \{t\} in:

- **time**
- **cut**
- **try**
- **butter**
- **button**
- etc.
Later Developments

Subsequent development of further orthographic elements: word-spacing, punctuation, paragraphing, etc.

Not fixed till early age of print. Reduce ambiguity, make writing increasingly accessible in abstract context:
Later Developments

Subsequent development of further orthographic elements: word-spacing, punctuation, paragraphing, etc.

It is of far more importance from here to history her civil administration and the conduct of her wars she annually elected magistrates the authority of her laws supreme overall her citizens, the tyranny of the last king made this liberty all the more welcome for such had been the rule of the former kings that they might not undeservedly be counted as founders of parts at all events of the city
Later Developments

Subsequent development of further orthographic elements: word-spacing, punctuation, paragraphing, etc.

It is of a Rome henceforth free that I am to write the history--her civil administration and the conduct of her wars, her annually elected magistrates, the authority of her laws supreme over all her citizens. The tyranny of the last king made this liberty all the more welcome, for such had been the rule of the former kings that they might not undeservedly be counted as founders of parts, at all events, of the city...
Contrasting alphabetic and logographic systems

Ease of learning... Typographic simplicity.
Ease of processing
Symbolic importance for linguistic community -- cf irregularity of English spelling
Next Meeting

Readings:

Assignment 2: Week 3.2 (due 9/12)

In his 1987 study of the cognitive effects of word-processing systems, Electric Language, Michael Heim wrote:

The accelerated automation of word-processing makes possible a new immediacy in the creation of public, typified text. Immediacy in the sense of there being no medium quod, no instrumental impediment to thinking in external symbols, but only a medium quo, or purely transparent element. ... [more]

Reading this passage, would you say that Heim's view of the effects of writing technology comes closer to that of Goody and Watt or of Scribner and Cole? Why? Write a paragraph briefly defending and explaining your view.