Writing Systems

InfoSys 103
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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.

Was development of language gradual or sudden? Does language presuppose neural modification?

"language might have emerged w. 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:
There are no extant "primitive" languages;
language emerges suddenly in social groups (creoles, etc.)
Types of detachable signs

Types of signs:

**Index**: stands in causal/spatial relation to the signified (smoke to fire, tears to sadness, pawprint to bear, blaze on tree to act of marking)

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

**Symbol**: arbitrary 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 -- poss. Represents 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

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

Petroglyphs, Bhimbetka, India, ca 9000 BC

Petroglyphs, Scandinavia, Bronze Age
Pictographic Communication Systems

Yukaghir (Siberia) 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

"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 gleich eine Milliarde," etc.

\[ \forall x \ (Fx \rightarrow Gx) \]

"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

1.

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.
2500 BC -- cuneiform “true” writing
2400 BC script used for Akkadian
2000 BC script used for Babylonian & Assyrian...
The Origins of "complete" writing

"Complete" glottographic system: signs denote words of the language

2. 

\[ \text{SIGN} \xrightarrow{\text{writing}} \text{SOUND} \]

(word in language)
The Rebus Principle

Rebus: signs stand in for (phonetic) names of original referents.
The Rebus Principle

"canting" -- seal of the Borough of Conleton (Cheshire)= CONger, LEo, TUN
Rebus priniple leads to logography

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

== “water” /a/ → “in” /a/

T “oracle” /me/ → plural suffix /-me/

Accompanied by increasing conventionalization of signs...
Rebus principle leads to logography

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

“water” /ə/ → “in” /ə/

“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 & “and” -- imagine s&, b&, etc.)
Signs come to stand in for syllables.
Sumerian has (C)V syllable structure.
Sumerian mixture of logographs & syllabic, like modern Japanese.
Tokens are origins of Sumerian writing?

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<thead>
<tr>
<th>Token</th>
<th>Proto-Logographic</th>
<th>Neo-Sumerian/Old Babylonian</th>
<th>Neo-Assyrian</th>
<th>Neo-Babylonian</th>
<th>English</th>
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<td>![Metal Proto-Logographic]</td>
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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 uses of \{t\} in time, try, butter, button, etc.
Contrasting alphabetic and logographic systems

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