



UC Berkeley School of Information



The First Information Technology: Writing Systems

Geoff Nunberg

School of Information, UC Berkeley

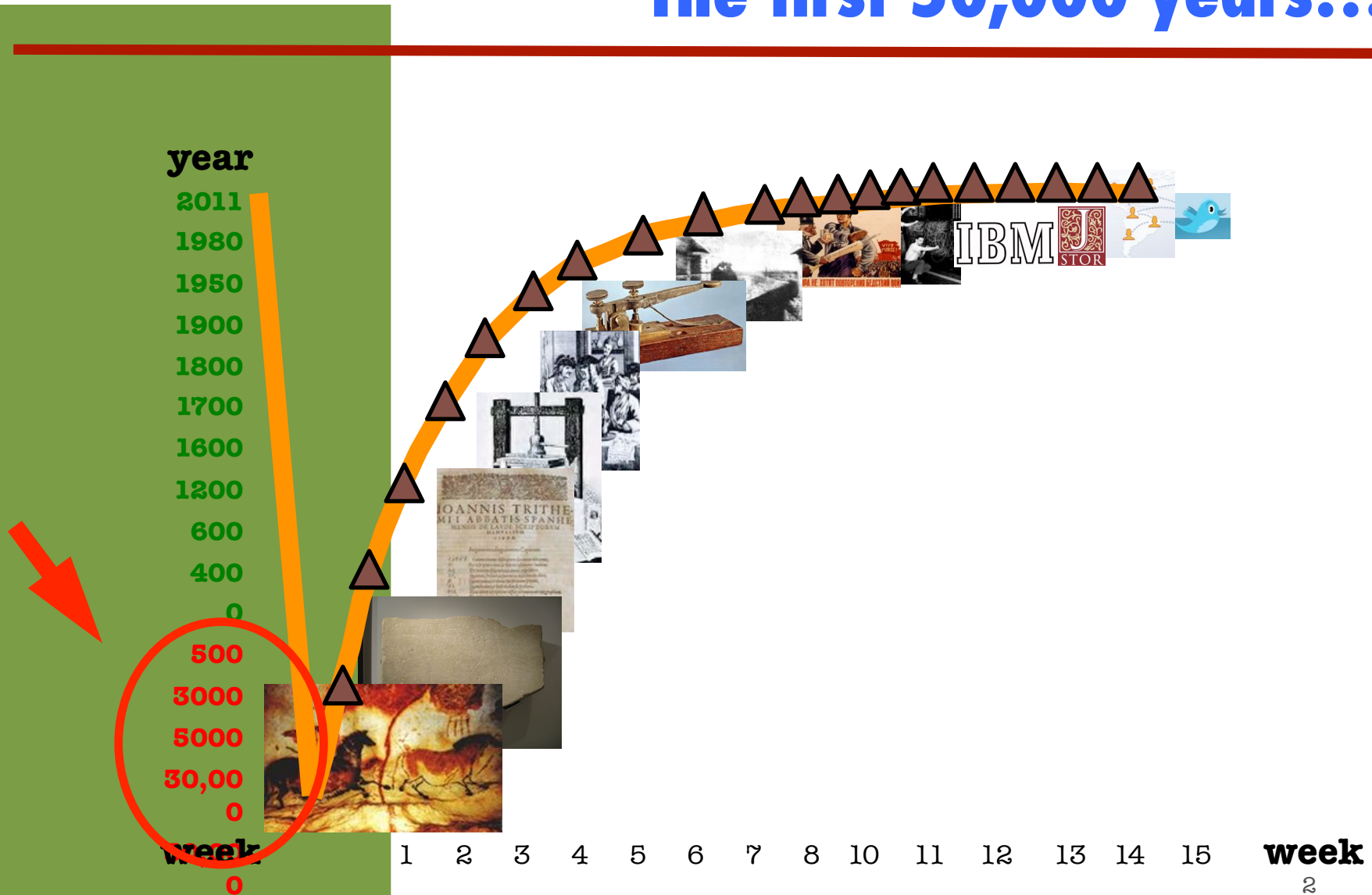
IS 103

History of Information

Jan. 26, 2012



The first 50,000 years...





Itinerary, 1/26

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems



What kind of "information" has a history?

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems

... it's always there when we look for it, available wherever we bother to direct our attention. We can glean it from the pages of a book or the morning newspaper and from the glowing phosphors of a video screen. Scientists find it stored in our genes and in the lush complexity of the rain forest. The Vatican Library has a bunch of it, and so does Madonna's latest CD. And it's always in the air where people come together, whether to work, play, or just gab.

What is it that can be so pervasive and yet so mysterious? Information, of course.

John Verity in *Business Week*, special number on the "Information Revolution," 1994



What kind of "information" has a history?

... it's always there when we look for it, available wherever we bother to direct our attention. We can glean it from the pages of a book or the morning newspaper and from the glowing phosphors of a video screen. Scientists find it stored in our genes and in the lush complexity of the rain forest. The Vatican Library has a bunch of it, and so does Madonna's latest CD. And it's always in the air where people come together, whether to work, play, or just gab.



What kind of "information" has a history?

... it's always there when we look for it, available wherever we bother to direct our attention. We can glean it from the pages of a book or the morning newspaper and from the glowing phosphors of a video screen. ~~Scientists find it stored in our genes and in the lush complexity of the rain forest.~~ The Vatican Library has a bunch of it, and so does Madonna's latest CD. ~~And it's always in the air where people come together, whether to work, play, or just gab.~~



The Scope of "Information"



... it's always there when we look for it, available wherever we bother to direct our attention. We can glean it from the pages of a book or the morning newspaper and from the glowing phosphors of a video screen. ~~Scientists find it stored in our genes and in the lush complexity of the rain forest.~~ The Vatican Library has a bunch of it, and so does Madonna's latest CD. ~~And it's always in the air where people come together, whether to work, play, or just gab.~~

Information (that has a history) always involves the creation, storage, transmission, or manipulation of *representations* of states of affairs.



Quantifying "information"

Table 1.6: Worldwide production of magnetic original content, if stored digitally using compression methods, in terabytes circa 2002.

Storage Medium	Type of Content	Terabytes/Yr Upper Estimate	Terabytes/Yr Lower Estimate	1999 Report Upper Estimate	1999 Report Lower Estimate
Magnetic	Videotape	1,340,000	1,340,000	1,420,000	1,420,000
	Audiotape	128,800	128,800	182,000	182,000
	Digital tape	250,000	250,000	250,000	250,000
	MiniDV	1,265,000	1,265,000	N/A	N/A
	Floppy disc	80	80	70	70
	Zip	350	350		
	Audio MD	17,000	17,000		
	Flash	12,000	12,000		
	Hard Disk	1,986,000	403,000		
	TOTAL	4,999,230	3,416,230		

Source: How much information 2003

Table 1.3: Worldwide production of printed original content, if stored digitally in terabytes circa 2002. Upper estimate is scanned; lower estimate is compressed.

Storage Medium	Type of Content	Terabytes/Yr Upper Estimate	Terabytes/Yr Lower Estimate	1999 Upper Estimate	1999 Lower Estimate	% Change Upper Estimates
Paper	Books	39	8	39	8	0
	Newspapers	138.4	27.7	124	25	12%
	Office Documents	1,397.5	279.5	975	195	43%
	Mass market periodicals	52	10	52	10	0
	Journals	6	1.3	9	2	-33%
	Newsletters	0.9	0.2	0.8	0.2	0
TOTAL		1,634	327	1,200	240	36%

Table 1.2: Worldwide production of original information, if stored digitally, in terabytes circa 2002. Upper estimates assume information is digitally scanned, lower estimates assume digital content has been compressed.

Storage Medium	2002 Terabytes Upper Estimate	2002 Terabytes Lower Estimate	1999-2000 Upper Estimate	1999-2000 Lower Estimate	% Change Upper Estimates
Paper	1,634	327	1,200	240	36%
Film	420,254	76,69	431,690	58,209	-3%
Magnetic	5187130	3,416,230	2,779,760	2,073,760	87%
Optical	103	51	81	29	28%
TOTAL:	5,609,121	3,416,281	3,212,731	2,132,238	74.5%

Source: How much information 2003

Peter



Quantifying "information"

The Beginnings of Information

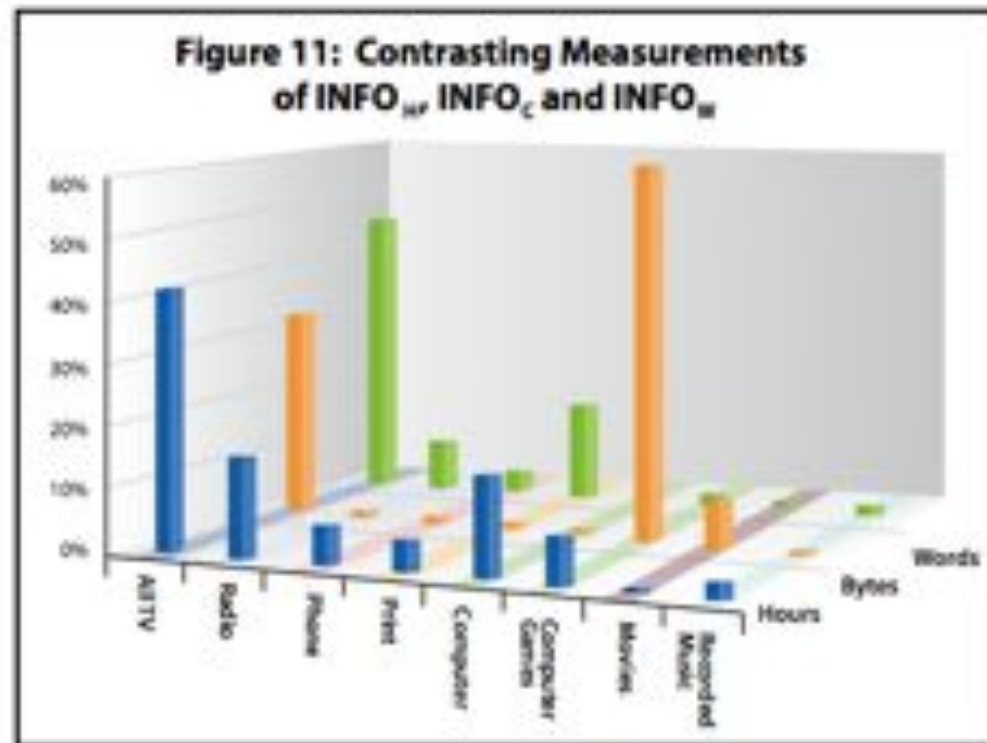
The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems



How Much Information? 2009 Report on American Consumers



The Beginnings of Material Representation

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems



Psamtik I



James V of
Scotland



FOXP2 gene

The First "Information System": Language

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

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

No direct evidence about origins of language

No existing "primitive" languages

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)



The Beginnings of Representational Artifacts



Henri Breuil



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

"Man's first affirmation of himself"
Maurice Blanchot



Robot & Jacques Marsal

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





The Beginnings of Representational Artifacts

"Images and symbols... were markers of periodic and continuous cultural processes, of rites, and of repetitive myths and stories..." Alexander Marshack





The Beginnings of Representational Artifacts

"... whereas notations of whatever sort were apparently means of recording the passage of time in terms of culturally significant events."





Charles S. Peirce

The Varieties of Signs



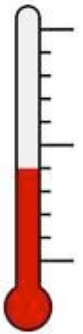
3 Types of signs (after Charles Peirce): *icon*, *index*, *symbol*

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

E.g,



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



Symbol: arbitrary relation between sign and signified.

E.g., written word *cat*, spoken word /kæt/.





The Varieties of Signs

The Beginnings of
Information

The Emergence of
Representation

The Variety of Signs

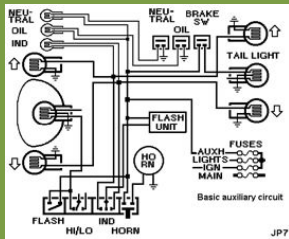
The Origins and
Development of
Writing Systems

Types of Writing
Systems

Independent
Inventions of Writing
Systems



The Varieties of Signs



Icon: sign stands in relation of resemblance or similarity to signified (though often only roughly).





The Varieties of Signs: Indexical

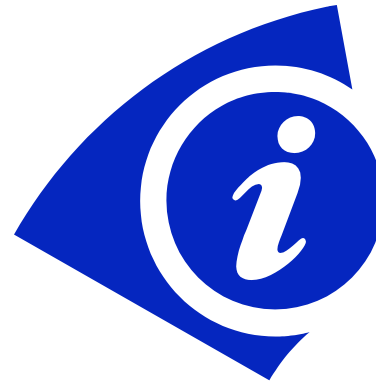
Index: stands in causal/spatial relation to the signified (pawprint to bear, blaze on tree to act of marking, thermometer to temperature)





The Varieties of Signs: Symbols

Arbitrary (or effectively arbitrary) relation between sign and thing signified



tree



Early Indexical Signs

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems

Earliest signs are mnemonics for record-keeping, genealogy, etc. (Tallying systems)

Knotted rope, notched stick or bone, etc.
Become frequent in upper paleolithic



Notched Bone, England, upper paleolithic, 12,000 years old



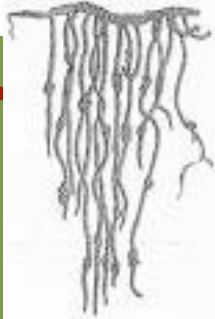
Notched Bone, Turkey, ca 3000 BC



Notched bone, Congo, ca. 25,000 BC -- may. represent lunar calendar



Elaborated Indexical System: The Inca *quipu*



Knots of varying colors in llama or alpaca hair

Sequences recorded population, taxes, geneology, astronomy (and possibly names) in base-10 positional system. System maintained by knot-keepers (quipucamayoq).

Limits: can record only quantity and category; requires extensive convention for interpretation



Early Iconicity

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems



Petroglyphs, Bhimbetka, India, ca 9000 BC



Rock carving, Hong Kong (Kau Sai), 3000 BC



Petroglyphs, Scandinavia, Bronze Age



Pictographic (Iconic) Communication Systems

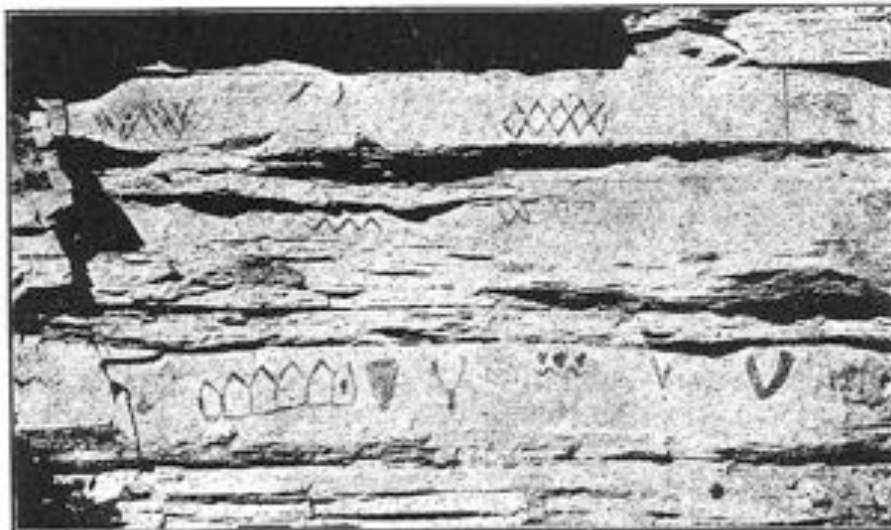


Fig. 4.—Geometrical forms. (From a photograph of rocks).





Pictographic (Iconic) Communication Systems

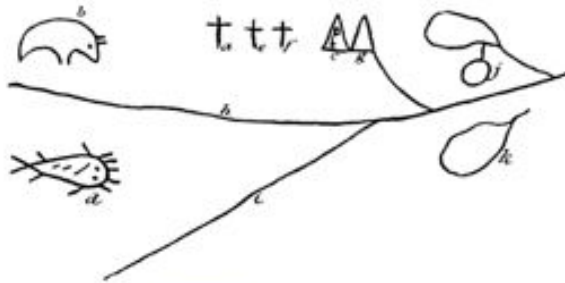
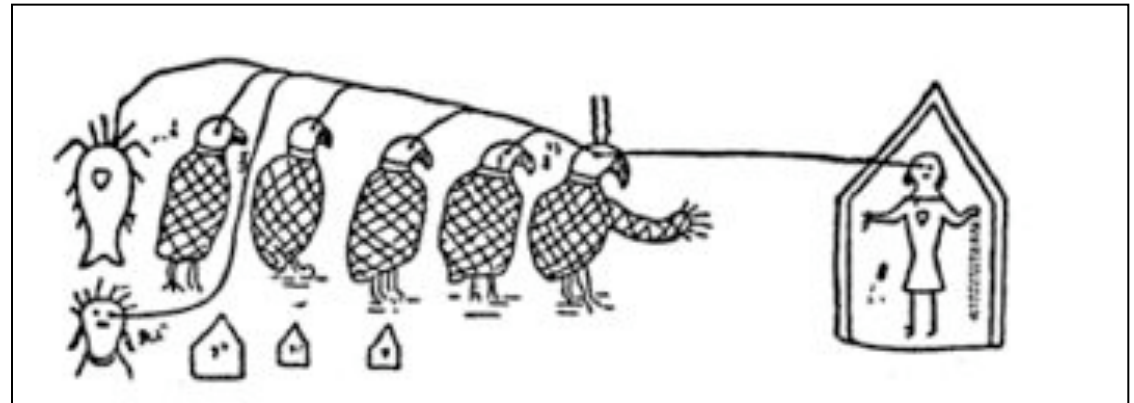


Figure 8. Ojibwa Love Letter (from Mallery 1893:363)



"Letter of credence" presented by Chippewa delegation to Washington, 1849

"The chief salutes the president, and his warriors belonging to the eagle and catfish totems are in harmony with him and are willing to accept the white man's ways."



Pictographic Systems

The Beginnings of Information

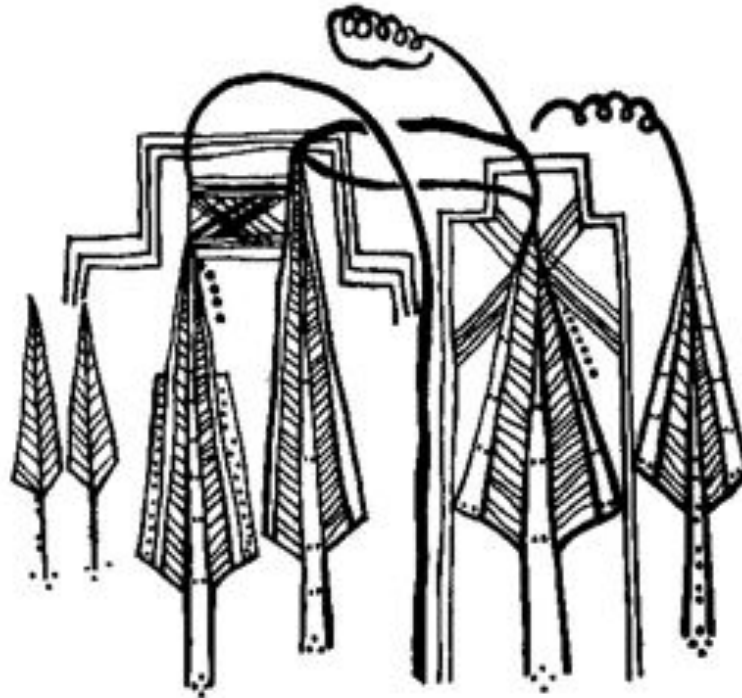
The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems



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



"Pictographic" Systems

The Beginnings of Information

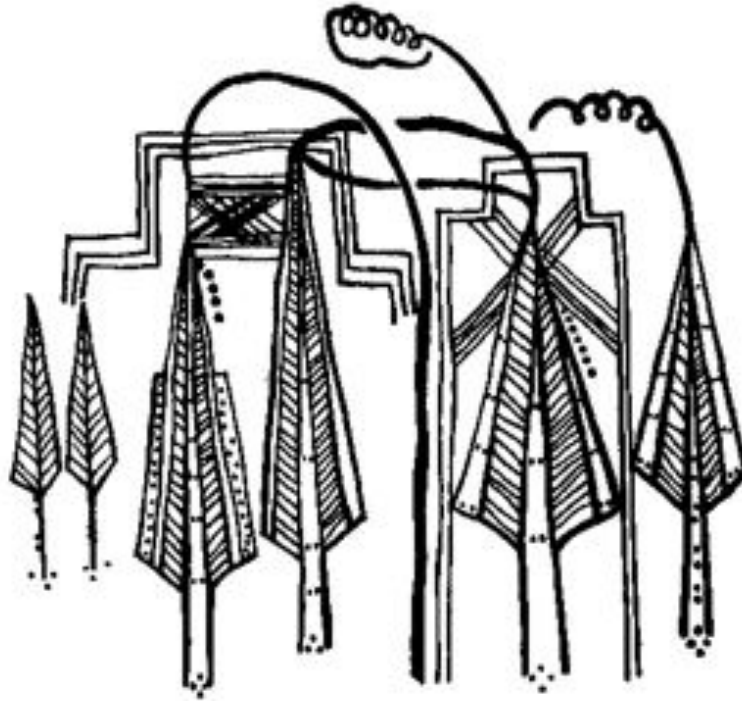
The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems



"I know you're fighting with that Russian girl you broke up with me over. I'm unhappy in my house as I think of you, but you should know there's another guy hitting on me, so get your act together before I get married and have children."



Abstraction in pictographic systems

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems

Extending pictographic 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."

person + mountain = "foreigner"

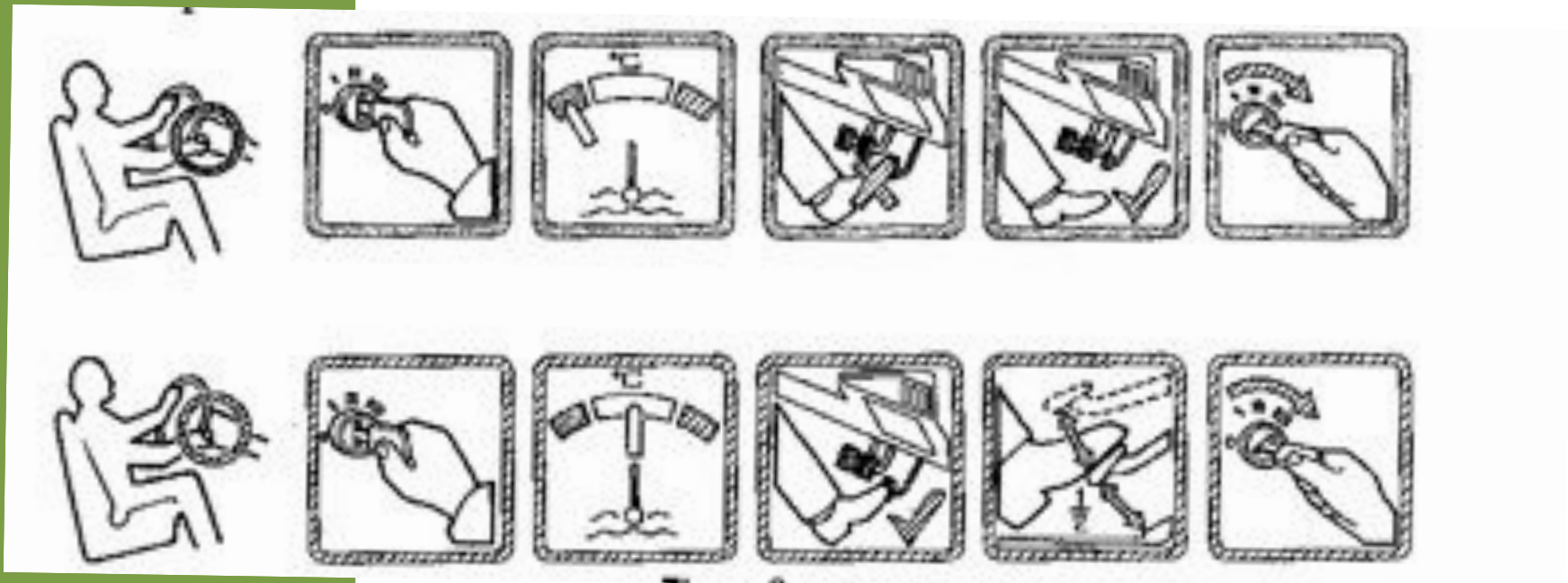
eye + water = "weep" etc.

Cf modern use of "metonymic" icons



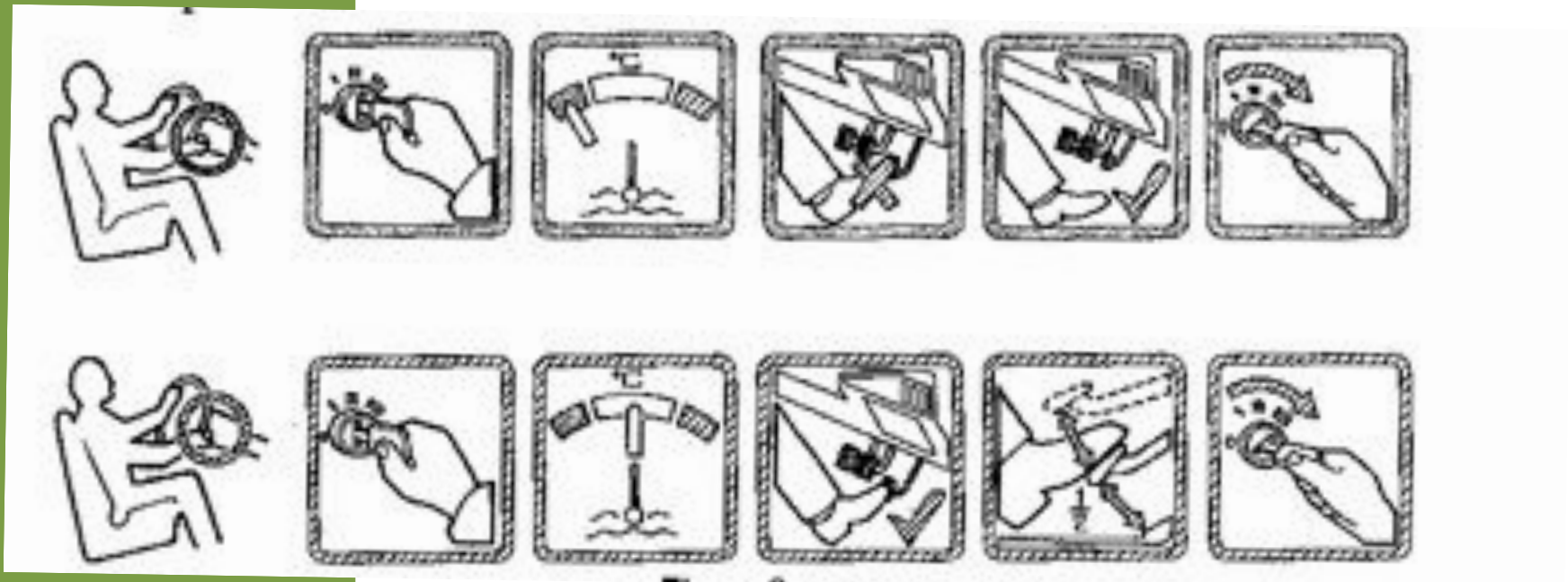


Ideographic (Semasiographic) Systems: the importance of context





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."



The limits of ideographic/ semasiographic systems

Semasiographic system: symbols stand directly for ideas, not for words of a language.

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," "Dieci alla nona potenza equivale a un miliardo," etc.

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

"For all x, if F of x then G of x"/"Everything that is F is G,"/
"If something is an X it's a G,"/ "being F always entails being G," etc.

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



Wilkins' universal language

The Beginnings of Information

The Emergence of Representation

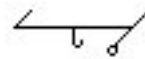
The Variety of Signs


The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems

Explaining the symbol



The generic character  doth signify the genus of space. the acute angle on the left side doth denote the first difference, which is Time. The other affix signifies the ninth species under the differences, which is Everness. The Loop at the end of this affix denotes the word is to be used adverbially; so that the sense of it must be the same which we express by the phrase, For Ever and Ever.

John Wilkins "'An Essay Towards a Real Character and a Philosophical Language' 1668



The origins of true writing

The Beginnings of Information

The Emergence of Representation

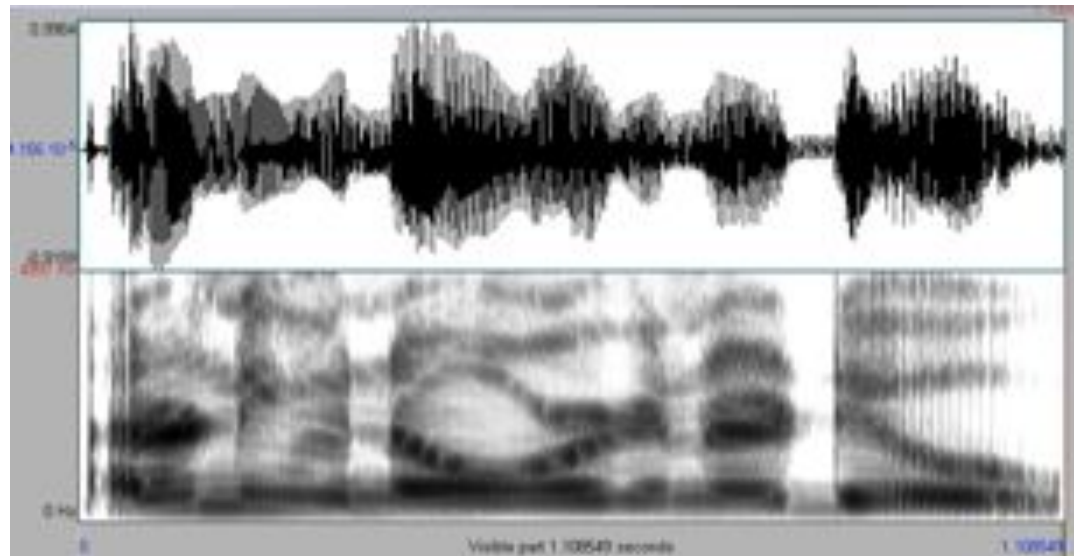
The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems

Writing – what a concept!



aydonlvn:owə?wīrgəneðtūw



The origins of true writing

The Beginnings of Information

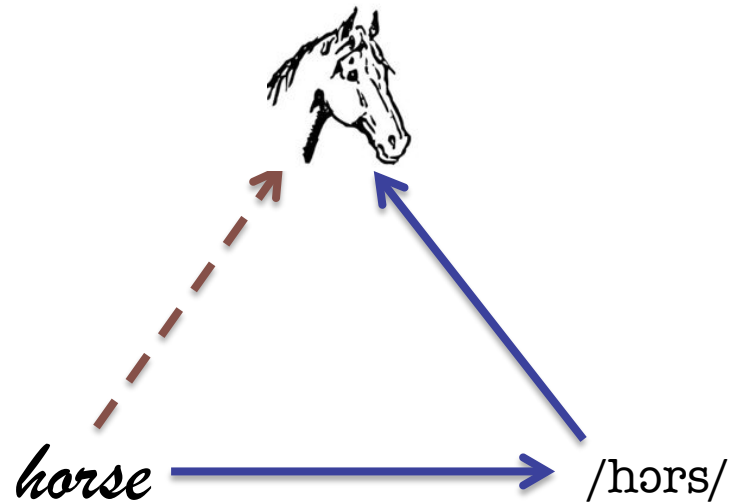
The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems



Writing: symbols represent elements of language rather than directly representing things in the world.



The origins of true writing

The Beginnings of Information

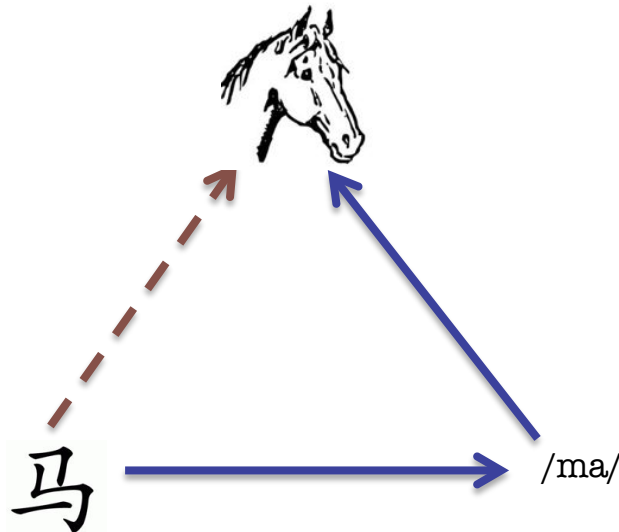
The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems



Writing: symbols represent elements of language rather than directly representing things in the world.



The origins of true writing

The Beginnings of Information

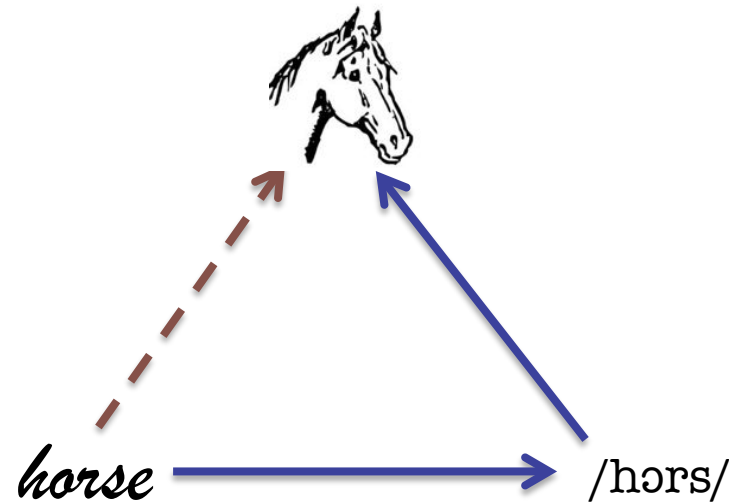
The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems



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

Cf "5" vs *five*," *cinque*, *wũ*, etc.

"\$" vs "dollars," etc.



Origins of Writing in Sumer

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems





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.



Bullae and tokens



Early cuniefom



Tokens as origins of Sumerian writing?



Figure 7 Pictographic tablet from Urak, Iraq, late fourth millennium B.C. The account in the upper central case, for example, shows the sign for sheep and five wedges standing for the abstract numeral 5. Courtesy Vorderasiatisches Museum, Staatliche Museen zu Berlin, East Germany.

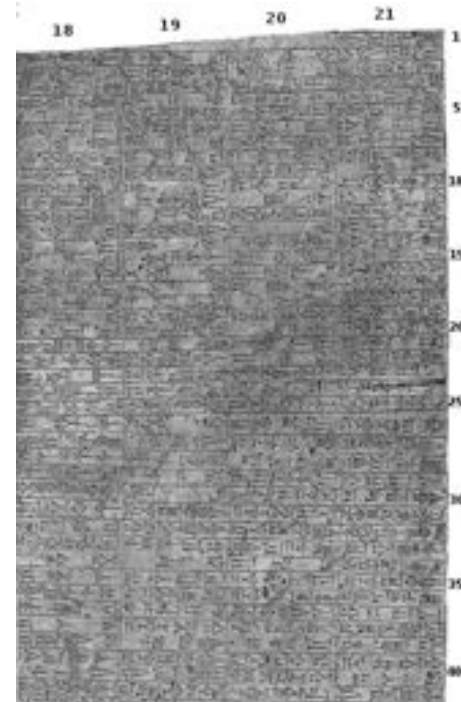
Evolution from Token to Cuneiform Writing					
Token	Pictograph	Neo-Sumerian/ Old Babylonian	Neo-Assyrian	Neo-Babylonian	English
					Sheep
					Cattle
					Dog
					Metal
					Oil
					Garment
					Bracelet
					Perfume



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





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/proclamations

- Liturgical texts

- Poetry



Origins of Writing in Sumer

Epic of Gilgamesh (7th c. BC)

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...



Increasing Abstraction of Written Form

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems

Proto-cuneiform c.3000 BC	Early cuneiform c.2400 BC	Late (Neo-Assyrian) cuneiform c.700 BC	Transcription and meaning
			sag "head"
			ka "mouth"
			du/gin/gub "go/walk/stand"
			gud "ox"
			udu "sheep"
			ku "fish"
			dug "pot"
			gi "reed, to render"

figure 2.2 The development from proto-cuneiform, through early umerian cuneiform, to later Akkadian cuneiform. Proto-cuneiform signs are often pictographic, though not always, as the sign for "sheep" shows.



The Origins of "complete" writing

The Beginnings of Information

The Emergence of Representation

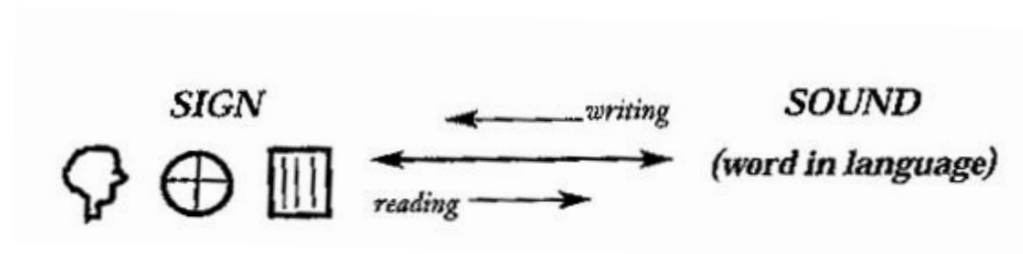
The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems

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



But how to signify "abstract" words? *Creation, after, but, believe, faithful, if, etc.*

Metaphoric extension (cf extended meanings of head, hand, foot, etc.)



Rebus: Icons of things that stand in for their (phonetic) names





The Rebus Principle



Eye



saw



ewe



duck



deer

"I saw you duck, dear."



Rebus principle leads to logography

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems

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...
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

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems

Logographs ultimately perceived as having purely phonetic value.

Cf English logographs – @, &, £, ¢

imagine the word *h@b&*

Where does this happen in everyday life?

.



Logography to Syllabic System

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems

Logographs ultimately perceived as having purely phonetic value.

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

Where does this happen in modern life?



Signs come to stand in for syllables

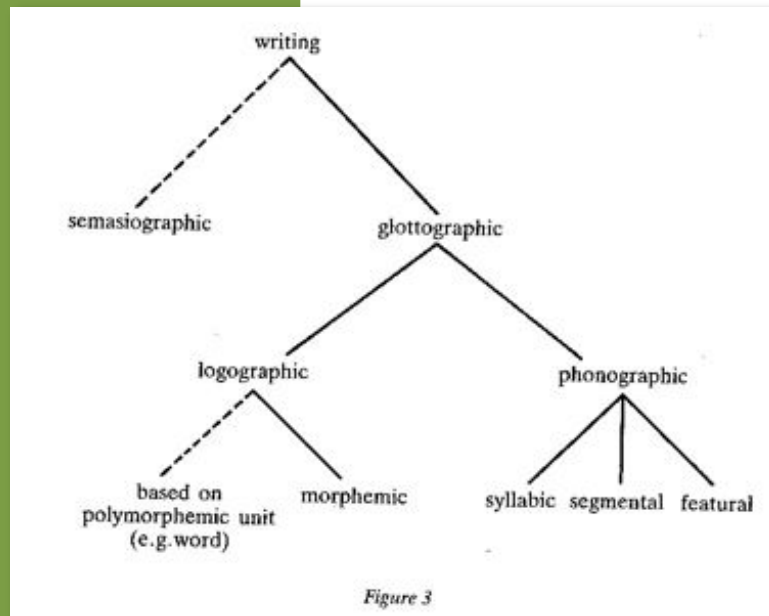
Logographs ultimately perceived as having purely phonetic value.

.



Origins of Alphabetic Writing

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



Logographic: mod. Chinese, Japanese (mixed)

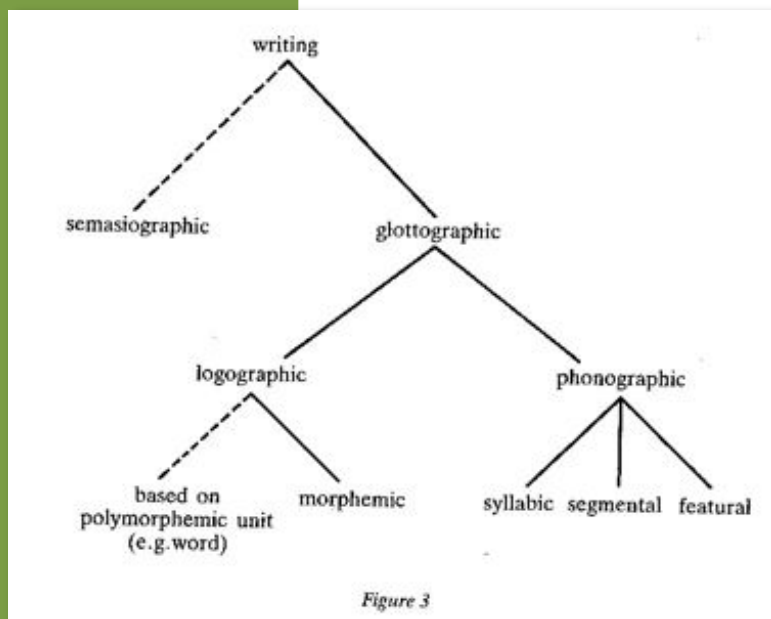
Syllabic: Linear B, Cherokee, Korean Hangul (featural)

Alphabetic: Roman, Cyrillic, Gk, Hebrew, etc,



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)

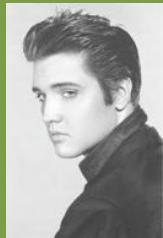
Alphabetic: Roman, Cyrillic, Gk, Hebrew, etc,

Problem with completely phonetic alphabetic systems: ambiguity.

Cf French *au, aux, ô, os, haut, hauts, eau, eaux, os*, etc.



Development of Written Symbols

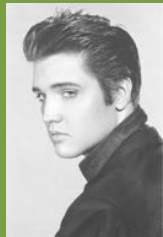


Iconic



Development of Written Symbols

Simplification of sign



Iconic

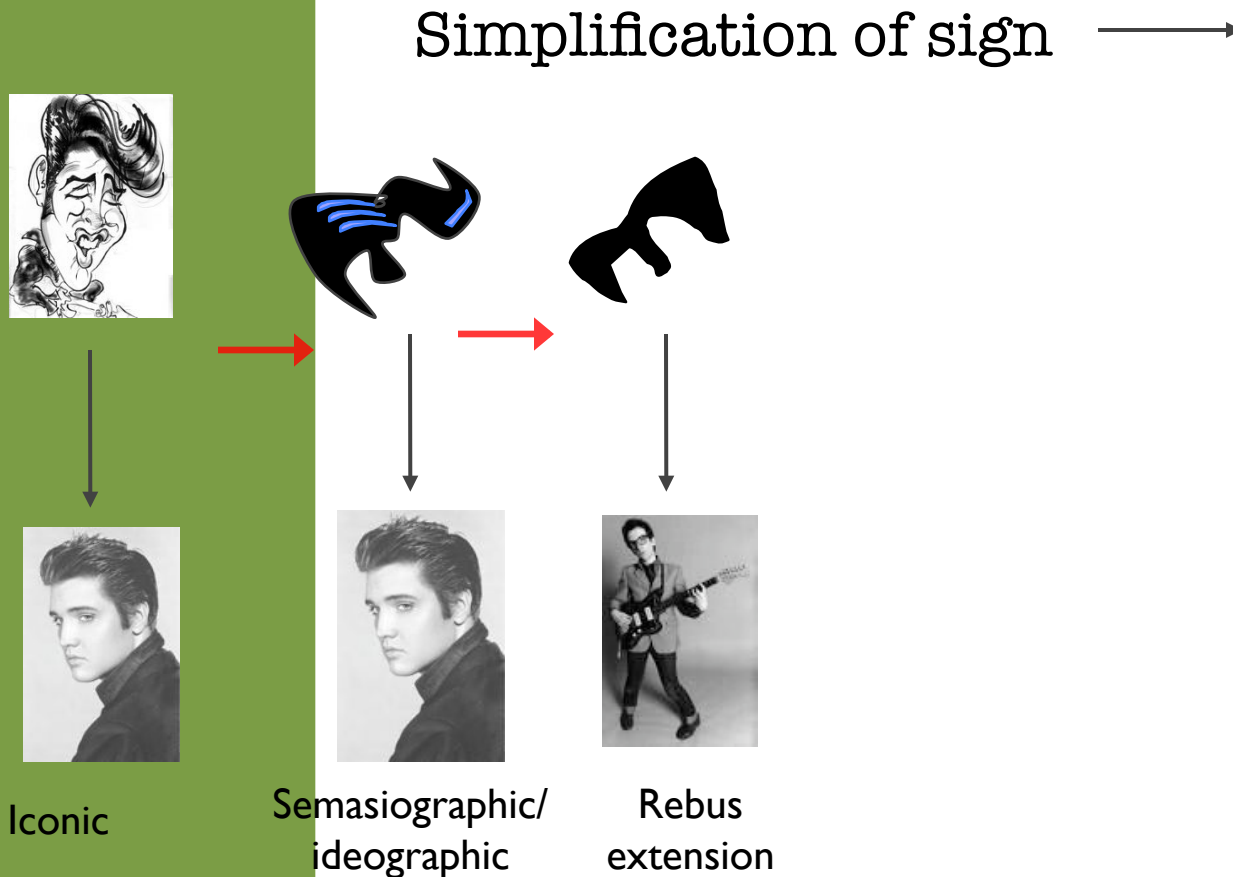


Semasiographic/
ideographic

Proto-writing

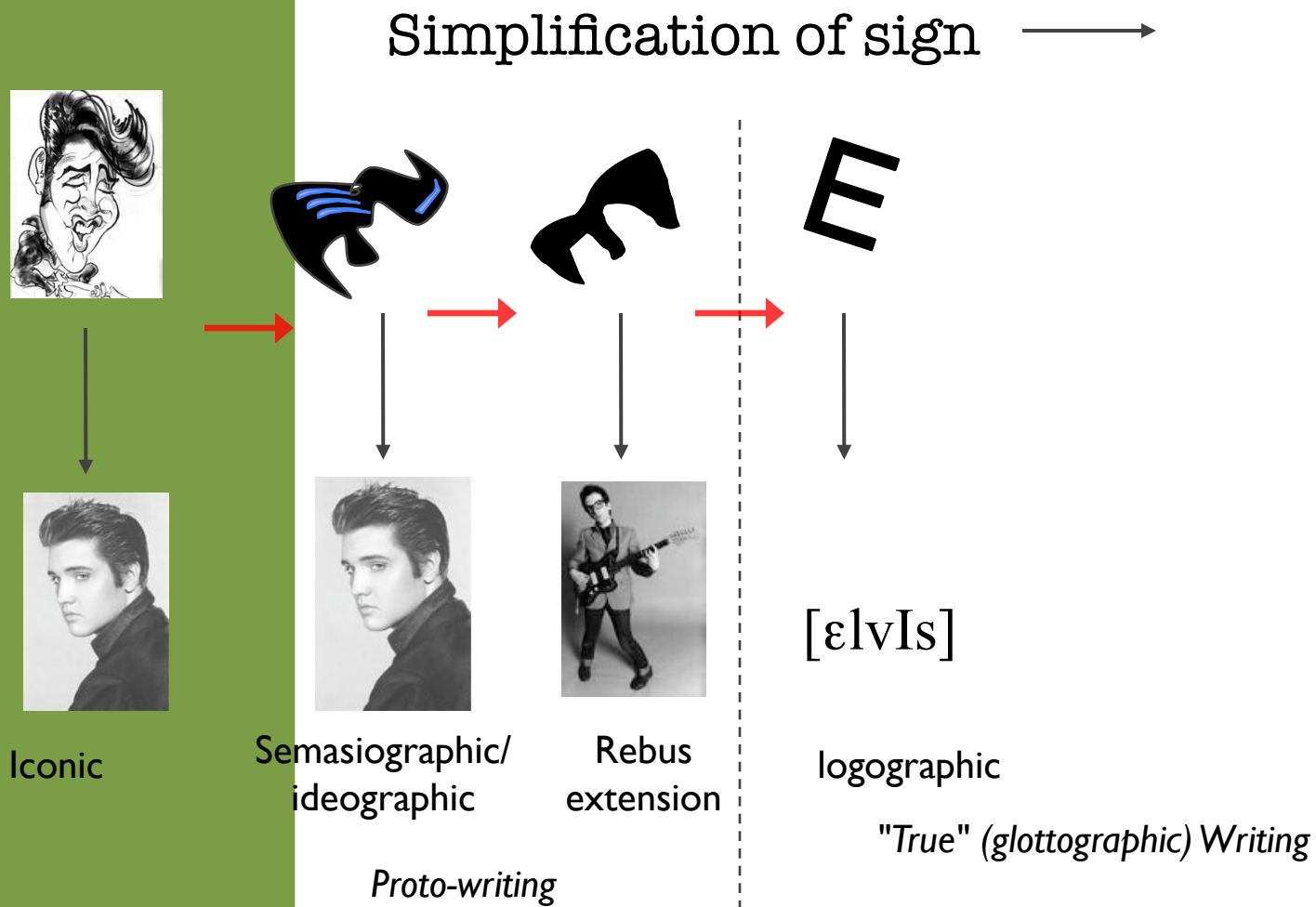


Development of Written Symbols





Development of Written Symbols





Development of Written Symbols



Iconic

Simplification of sign



Semasiographic/
ideographic



Rebus
extension



Proto-writing

E

[ɛlvɪs]

logographic

E

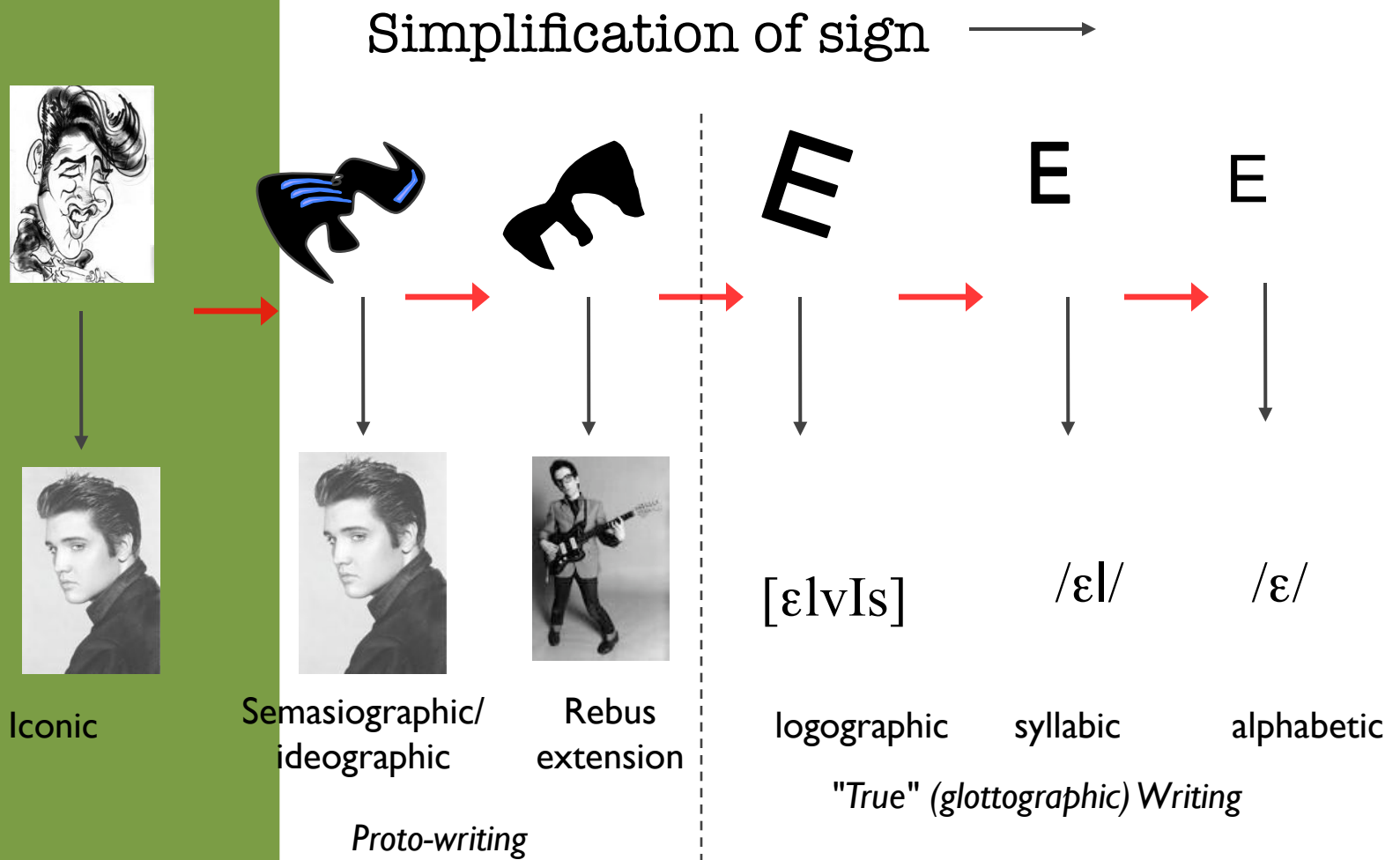
/ɛl/

syllabic

"True" (glottographic) Writing



Development of Written Symbols





The diagram illustrates the historical development of the Phoenician syllabary into various modern alphabets. The timeline on the right indicates the approximate date of each stage, ranging from 1200 BC to 800 BC. A red arrow points to the Phoenician syllabary at the top.

- Phoenician Syllabary** (1200 BC)
 - Old Hebrew** (1000 BC)
 - Cypriot Syll.
 - Punic
 - Etruscan
 - Latin
 - Gothic
 - Slavonic
 - Greek Alphabet** (800 BC)
 - Cyrillic
 - Latin
 - Gothic
 - Slavonic
 - Aramaic** (700 BC)
 - Syriac
 - Hebrew
 - Arabic
 - Malay
 - Indic
 - Chinese
 - Japanese Syll.

But evidence is slight for derivation of Chinese from proto-Sumerian

Source: J. J. Gelb, *A Study of Writing* (Chicago: University of Chicago Press, 1963), pp. x-xi.



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 to wider community or in absence of immediate context,





Later Developments

boustrophedon

ΦΑΝΟΔΙΚΟ
ΧΟΜΟΤΟΜΟΚ
ΡΑΤΕΟΣΤΟ
ΗΝΙΟΚΟΠ
ΣΙΟΚΡΗΤΗΡ
ΧΟΠΥΙΑΚΕΔΑ
ΡΗΤΗΡΙΟΝ:Κ
ΑΙΘΟΝ:ΕΠ
ΡΥΤΑΝΗΙΟΝ
ΕΔΩΚΕΝ:ΣΥΚΕ
ΕΥΣΙΝ

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software—to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose





Independent Invention of Writing Systems

The Beginnings of Information

The Emergence of Representation

The Variety of Signs

The Origins and Development of Writing Systems

Types of Writing Systems

Independent Inventions of Writing Systems



Independent writing systems: The Cherokee Syllabary



Sequoyah [George Gist] and the "talking leaves": 1819

a	e	i	o	u	v [ʁ]
D a	R e	T i	Ꭰ o	Ꭱ u	Ꭲ v
S ga Ꭳ ka	F go	Y gi	A go	J gu	E gv
Ꭴ ha	P ho	Ꭶ hi	F ho	Ꭷ hu	Ꭸ hv
W la	Ꭺ le	P li	Ꭼ lo	M lu	Ꭽ lv
Ꭾ ma	Ꭿ me	H mi	Ꮀ mo	Ꮁ mu	
Ꮊ na Ꮋ hna Ꮌ nah	A ne	h ni	Z no	Ꮎ nu	C nv
Ꮏ qua	Ꮐ que	Ꮑ qui	Ꮒ quo	Ꮓ quu	Ꮔ qv
Ꮖ s Ꮗ ũ sa	Ꮘ se	Ꮙ si	Ꮚ so	Ꮛ su	R sv
Ꮜ da W ta	S de Ꮟ te	Ꮠ di Ꮡ ti	V do	S du	Ꮤ dv
Ꮦ dia Ꮧ tia	L tie	C ti	Ꮩ tio	Ꮪ tu	P thv
G tsa	Ꮮ tse	Ꮯ tsi	K tso	Ꮮ tsu	C tsv
G wa	Ꮰ we	Ꮱ wi	Ꮲ wo	Ꮳ wu	Ꮴ wy
Ꮮ ya	B ye	Ꮭ yi	f yō	G yu	B yv



Independently invented writing systems: The Cherokee Syllabary

GWY  **JOAHOA.**
CHEROKEE PHOENIX.

VOL. I. NEW ECHOTA, THURSDAY MARCH 6, 1828. NO. 3.

EDITED BY ELIAS BOURNOUTT.
PRINTED WEEKLY BY
ISAACH. HARRIS,
FOR THE CHEROKEE NATION.
At \$1.00 if paid in advance, 25 in six
months, or \$2.50 if paid at the end of the
year.
To subscribers who can read only the
Cherokee language the price will be \$1.00
in advance, or \$2.50 to be paid within the
year.
Every subscription will be considered as
continued unless subscribers give notice to
the contrary before the commencement of a
new year.
The Phoenix will be printed on a Super-
fine sheet, with type entirely new procured
for the purpose. Any person presenting
an advertisement, and forwarding payment
for the same, shall receive a receipt
therefor.
Advertisements will be inserted at seven-
ty-five cents per square for the first inser-
tion, and thereafter at a half cent for each
subsequent insertion, longer runs in propor-
tion.
All letters addressed to the Editor,
post paid, will receive due attention.
THE CHEROKEE PHOENIX, PUBLISHED
WEEKLY, BY ISAACH. HARRIS, AT
NEW ECHOTA, IN THE CHEROKEE NATION.
OFFICE OF THE EDITOR, AT NEW ECHOTA,
CHEROKEE NATION.
LARGE OF ADVERTISING SPACES.
Mr. Editor—In weekly printing, as the
pages of a Magazine printed in the year
1828, my attention was attracted by a col-
lection of the Cherokee Syllabary.

**CONSTITUTION OF THE CHERO-
KEE NATION.**
*Formed by a Convention of Delegates from
the several Districts, at New Echota, Ja-
n. 1827.*

ARTICLE VI.
Sec. 1. Whereas the ministers of the
Gospel are, by their profession, dedicated
to the service of God—and the care of
souls, and ought not to be diverted from the
great duty of their function, therefore, as
ministers of the Gospel, or public preachers,
of any religious persuasion, which be con-
tinues in the exercise of his pastoral func-
tions, shall be eligible to the office of
Principal Chief, or a Seat in either house
of the General Council.

Sec. 2. No person who desires the be-
ing of a God, or a future state of rewards &
punishments, shall hold any office in the civil
department of this Nation.

Sec. 3. The free exercise of religious
freedom, and serving God without discolor-
ation, shall forever be allowed within this
Nation: *Provided*, That this liberty of con-
science shall not be so construed as to ex-
cuse acts of licentiousness or justify pro-
ceedings inconsistent with the peace or soli-
dity of this Nation.

Sec. 4. Whenever the General Coun-
cil shall determine the expediency of ap-
pointing delegates, or other public Agents,
for the purpose of transacting business with
the Government of the United States; the
Principal Chief shall have power to recom-
mend, and by the advice and consent of the
Council, shall appoint and commission
such delegates or Public Agents accordingly;
and, on all matters of interest touching
the rights of the citizens of this Nation,

shall be continued, until altered or repealed
by the legislature, except where they are
temporary, in which case they shall expire
at the times respectively limited for their
duration; if not continued by act of the legis-
lature.

Sec. 12. The General Council may at
any time propose such amendments to this
Constitution as two thirds of each house
shall deem expedient; and the Principal
Chief shall issue a proclamation, directing
all the civil officers of the several Districts
to promulgate the same in conformity as
possible within their respective Districts,
at least one month previous to the next
General election; and if at the first session
of the General Council after each General
election, two thirds of each house shall,
by yeas and nays, ratify such proposed
amendments, they shall be valid in all in-
suits and perpetuity, as parts of this Con-
stitution; *Provided*, That such proposed
amendments shall be read on three several
days, in each house, as well when the same
are proposed, as when they are finally rat-
ified.

There is Convention at New Echota, this
twenty-sixth day of July, in the year of our
Lord one thousand eight hundred and twenty-
eight; to wit: In the
presence of
Delegates of 6
JNO. DOSS, 1
JOHN BLEDI
Delegates of
GEORGE LO
JNO. SROTH
EDWARD GI
Delegates of 1
JOHN J. ARTIN.

Cherokee Phoenix: First
American Indian newspaper
(1828)



Independently invented writing systems:

Korean Hangul

Writing system invented in mid-15th c. to replace hanja (Chinese-based writing system). Invention credited to King Sejong ("the Great"), who introduced it to increase mass literacy. Possibly influenced by central Asian scripts.

Only "featural" system: symbols representing sounds as features (i.e., "labial," etc.) are clustered into a single "block" representing a syllable.



Hunmin Jeong-eum
Exemplar (1446):
Earliest Hangul text



Assignment for 1/31

Havelock writes:

The invention of the Greek alphabet... constituted an event in the history of human culture, the importance of which has not as yet been fully grasped. Its appearance divides all pre-Greek civilizations from those that are post-Greek. ... On this facility were built the foundations of those twin forms of knowledge: literature in the post-Greek sense, and science, also in the post-Greek sense.

Consider just one aspect or element of this broad claim. On the basis of the specific evidence presented by Havelock and Gough, would you say it is largely true, largely false, or true in some respects?