speech → unbounded

social memory
- mnemonics

archaeology & literacy
- symbols ↔ ideas
  - pictographs; figurines; physical mnemonics
- extended exploration
- symbols ↔ sound
  - explosion of combinatorial complexity

literacy & the state
- Sumer: economic power
  - 9 ka: tokens; 5.1 ka: cuneiform tablets
- China: ideological power
  - 6-5 ka: ceramics; 4 ka: oracle bones, bronzes
- Maya: political power
  - 2.6 ka: Olmec glyphs; 2.4 ka Maya Glyphs

arch preservation
- Shang & Dynastic Egypt

power & impact of literacy
- traditions/customs → laws/regulations
- social memory → institutional memory

the spoken word

finite number of sound structures, infinite number of utterances!

mapping sounds to ideas...
- phonemes: limited array of sounds
- lexemes: limited array of rules for forming words
- syntax: limited array of rules for forming sentences
- pragmatics: limited array of rules for how sentences can be deployed in conversation

speech & social memory

- speech is...
  - dynamic → constant change over course of utterance
  - “living” → subject to error & revision
  - ephemeral → is gone once utterance is ended

- social memory =
  - the social act of remembering
  - group-based information storage where speech is the critical element in transmission of information

- HOW ARE THINGS REMEMBERED & REPEATED AFTER THE UTTERANCE IS GONE?

speech & social memory

- mnemonics = techniques that aide memory
  - ordered phrases & acronyms
    - Kingdom, Phylum, Class, Order, Family, Genus, Species
      → King Paul Called Out For Gus and Sam
  - rhyme, metaphor & simile
    - Thirty days hath September...
    - “that man is a fox” v. “that man is sly as a fox”
  - physical objects as mnemonic devices...
Inka Quipu census, military, transactional counts
Ornaments “recording” significant life events

mapping symbols to ideas
• very long period of exploration...physical mnemonics?

mapping symbols to sounds
• finite number of graphical/symbolic structures, infinite number of textual representations

Assamese vowels Assamese consonants

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power & state formation

Karl Marx in 1875

• economic power = control the “means of production”

• ideological power = control the means of producing, distributing and consuming powerful cultural/political symbols

• political power = control of the means to make war

why do people relinquish the means of production?

origins of writing in Sumeria

• clay envelopes (bullae) + tokens + impressions, 5.5 ka

• envelopes + impressions of tokens, 5.2 ka

• clay tablets + cuneiform (“wedge-shaped”) impressions, 5.1 ka
  – abstracted representations of token impressions
  – initially logographic (symbols represent whole ideas)
  – but increasingly phonographic (symbols represent speech sounds)
Impetus for development of writing technology was economic power.
After 5 ka, rapid diversification of subjects.

Epic of Gilgamesh (ca. 2750-2500 BC) in cuneiform

**WHY?**

**China: Yangshao Period ceramic marks, 7-5 ka**
- pictographs: symbols representing natural objects (e.g., sun, moon)
- numerals (possibly)
- craftsmen’s marks
- mnemonic knots
- direct connection with Chinese characters controversial

**late Longshan & Early Shang 5-4 ka**
- oracle bones & scapulimancy
  - buffalo scapula, tortoise plastraons
  - “hot poker” applied to lower surface forms web-like cracks on upper surface
  - cracks interpreted to answer questions
    - weather, military campaigns, harvests, pregnancies
  - bones inscribed with prognostication
  - divination rituals tightly controlled by literate elite
  - IDEOLOGICAL POWER
  - 1-900-PALM-RDR?

- Shang characters were primarily logographic
  - by Eastern Han Dynasty (25-220 AD) see shift to two-part characters:
    - signfic: giving a “ballpark” meaning
    - phonetic: giving a “ballpark” sound
- phonetic component lends infinite combinatorial complexity
- (but not as flexible) as alphabetic system
  - same trajectory as cuneiform?
• earliest known Mesoamerican glyph → Olmec
  – San Andres, Tabasco, Mexico, 650 BC (2650 BP)
  – indicates early association between words for calendrical dates and political elites

- evidence that glyphs were spoken

Olmec cylinder seal

“King 3 Ajaw” = “Ruler born on the third day of the sacred month Ajaw (260 day sacred Mesoamerican calendar)

• Maya: 2400-1800 BP (400 BC – 200 AD)
  – pictorial glyphs → idea, word, syllable, sound, or some combination
  – heads of human, monster or Gods
  – detailed control of genealogies
  - what you have to do if base a state on kinship…
  – record major events in rule of leaders, inter-group warfare, the sacrifice of prisoners
  – not religious focus!
  – POLITICAL POWER

appearance of writing and archaeological preservation
China & Egypt

Bamboo Strips
Zhou Dynasty bronze bell