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Information Across Time and Space

Information Handling, Computation, & Communication

+

The Mobility of Knowledge

+

Historical Sites of Knowledge

To Frame This Module…

- Another def nition of knowledge & information (while smudging the distinction): information as process; must be “in motion” to create value [Hint: think of potential vs kinetic energy, etc]
  - information-in-motion accretes and has synergies over time, so “knowledge grows,” much as species evolve through greater diversity
  - all information is subject to a cost-free “network effect:” the more people “in the loop” (ie, as actors in “knowledge-making communities”), the more robust the growth of knowledge
  - such growth requires several tools; in order they are: language, writing, growing literacy, media and “pipes” for diffusion, repositories for retention, conceptual frameworks to organize information
  - The growth and diffusion of information and knowledge can reach a “tipping point” to yield an informed public—upon which stable democracies can be built
- This module will therefore offer a historical overview of the growth and diffusion of knowledge, indicating how those processes gave us two of our greatest human assets, science and democracy—keeping in mind the many downsides and reversals

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Ways of Keeping, Using, and Moving Information Today [FYI, for reference]

- Info Handling
  - Databases
  - Libraries and archives
  - Banking, insurance, & inventory systems
  - Government & data-mining
- Computation
  - Calculation, analytics
  - Rule-based info handling
- Communication
  - Internet, Web, etc.
  - Conferencing
- Combinations
  - Distributed computing & intelligent communities
  - Instant data lookups and calculations at a distance

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3+ Types of Information Practices

- In the world of information, all 3+ are relevant, with little real historical succession among them:
  - Info handling as language, grammar, syntax, literacy: even more, systems of classif cation
  - Computation from abaci to Pascal & Babbage, to computers & calculators
  - Communication: texts, coins/signs/insignia, communications venues, p2p, and f2f.
- In this module, we'll focus largely on information handling and communication, as calculation was historically less signif cant until about 1950
- So…

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Now, let's do some history…

Historical Development of Information and Sites of Knowledge

- Sumerian (i.e., Babylonian, Iraqi) writing as origin, ca. 3500 BCE
  - [Probably roughly simultaneous to Incan literacy using *quipu*, or knotted rope]
- Bureaucratic purposes
- Restricted realm of knowledge and literacy: officials and priests—indeed: history of information is in its democratization! (cf. Paolo Friere, *Pedagogy of the Oppressed*)
- Alphabets & hieroglyphs: Egyptian, Hebrew, Hittite (Code of Hammarabi), Phoenecian
- Early counting and accounting methods

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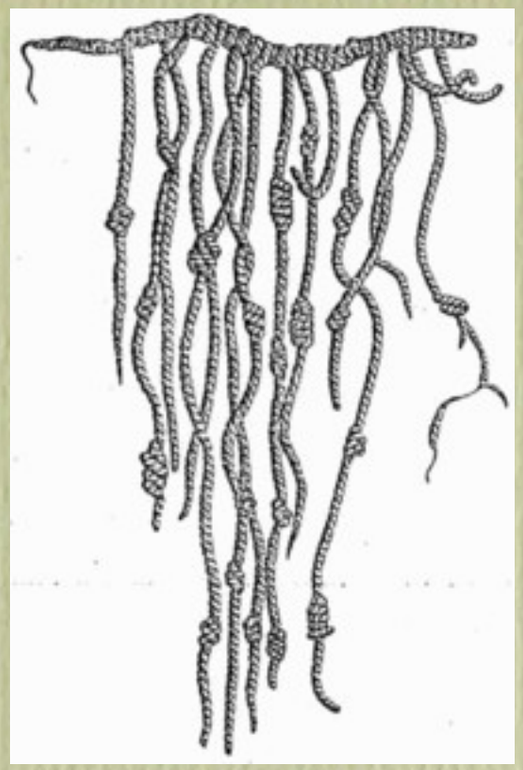
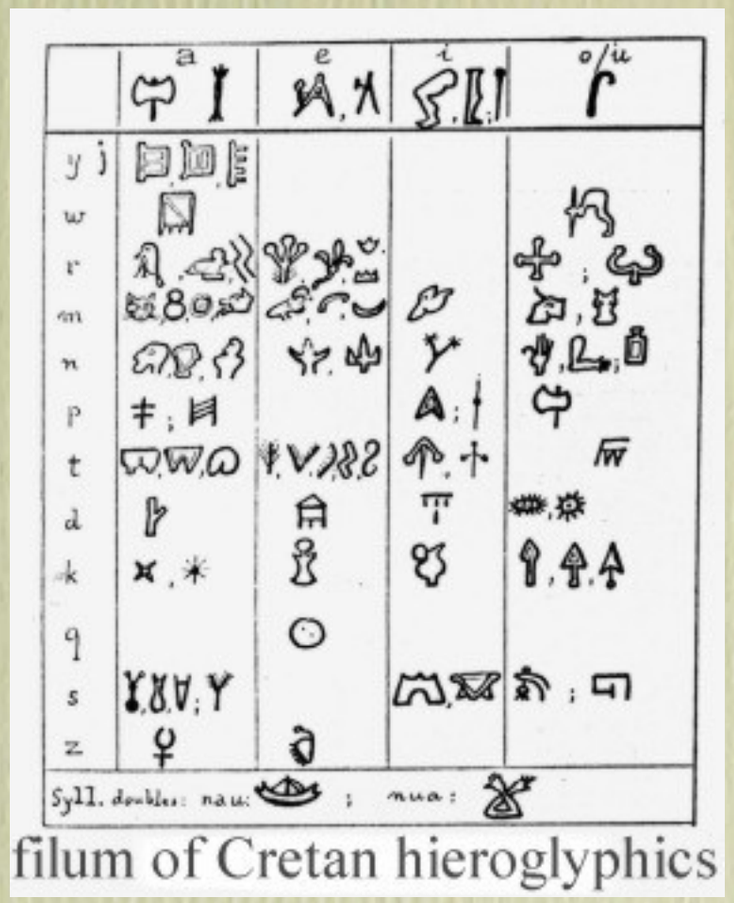
Incan quipu



Source: Meyers Konversations-Lexikon, 1888



filum of Cretan hieroglyphics

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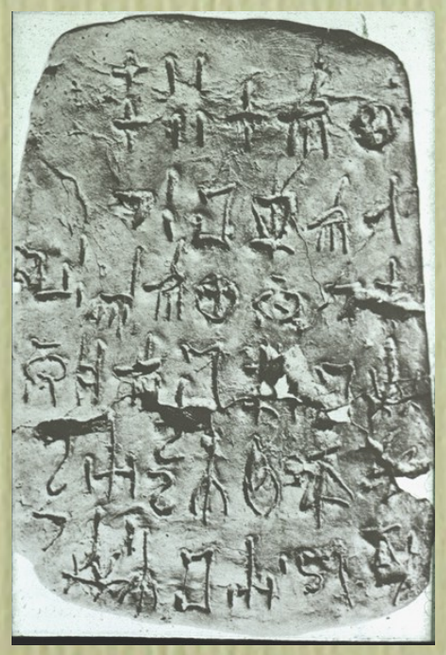

Source: Undetermined

Early Cycladean Linear A

Source: Undetermined

Sumerian clay tablet

Texts as Modes of Control and Difference

- The politics of limited literacy & info access
  - Rhetorical/political/religious high-ground
  - Knowledge as power
  - Monopoly of knowledge by elites or their operatives (national security post-9/11?)
- Language and literacy as abstractions
  - Key notion here: from data to info to fact—but each is more abstracted than the previous, and those who control the methods of abstraction control the flows of knowledge and information (estate tax as “death tax”)
  - Whither ‘truth’??

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The Rules, Rites, Politics and Processes of Abstraction

- Question of who controls the means and parameters of abstractions—this is more than an issue about the veracity of labels
- The emergence of codes, standards and means of inclusion and exclusion
- Mechanisms of abstraction as ways to build power
- Privileging of abstractable/objective over the tacit and felt (a gender issue here?)
  - Problem of “ways of seeing,” and “ways of knowing”: is an engineer’s knowledge more certain than that of the craftsperson?
  - If men are adept at abstraction, does the traditional sensory knowledge of women and “primitives” get disparaged?

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Sites of Knowing in the West

- Classical era libraries
  - Ephesus
  - Aescleppius & medicine
  - Pergamon
  - Alexandria: destroyed by Christians, 391 CE—in 392 CE, Christianity became off cial religion of Roman Empire

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Source: Undetermined

Ephesus

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The Politics of Classical & Medieval Knowledge

- Alexandria: patronage scholars & the popular library
- Romans and texts: contract law as scalable language—an early “peer-to-peer” system
- Catholicism & the politics of missionary knowledge
  - [anecdote: christianizing Scandinavia]
- Islam & Knowledge: Cordoba ca. 1000 CE
  - Circulation of classical ideas
  - Jews and Muslims: whither Catholicism? (answer: in the monasteries)
  - Jews as cultural repositories of knowledge: Kasimierz and Salonika
- Caveat: Muslim closing off of East from West; Mongolian opening, 1200-1350
  - Marco Polo and the “discovery” of the East

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Modernizing Knowledge and Information

- Rise of the university, 1250-1350
- Gutenberg & printing, 1450-1500
- Protestant Reformation, 1517-1575
- Scientif c Revolution (Copernicus, Galileo, Bacon, Newton)
- Enlightenment and the rise of democratic literacy, 1700s
  - Popular literacy, from political broadsides to pornography
  - Emergence of “social” reading

Key Reminders…

- In all of this, we're implicitly looking at information as a flow; information-in-movement as the basis for the development of new knowledge

- In *Annie Hall*, Woody Allen said that love is like a shark: it has to keep moving or it drowns. We might say the same for information.

- Note how a lack of information-in-motion can explain the intellectual stagnation of the "Dark Ages" in Europe. Perhaps the same can be said of ancient China, where info rarely moved outside of the mandarin circles.

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Not All Knowledge is Equal; Try "Knowledge" Without Traction

- Two kinds of "forgotten" knowledge: "erroneous" and unleverageable
- "Erroneous" knowledge—erroneous either factually or socially
  - Phlogiston: the etherial, elusive substance in all combustibles
  - Humors: the vapors and gases that cause disease—but note the impact this wrong concept had on early public health practice
  - Geocentrism (Ptolemy): Copernicus & Galileo, but OK for most navigation
- Unleverageable knowledge—lacks either the societal or knowledge base to be sustained
  - Edward Jenner's smallpox vaccine
  - Countless formulas for glass, wine; local seed stocks
  - [Abstinence education?]

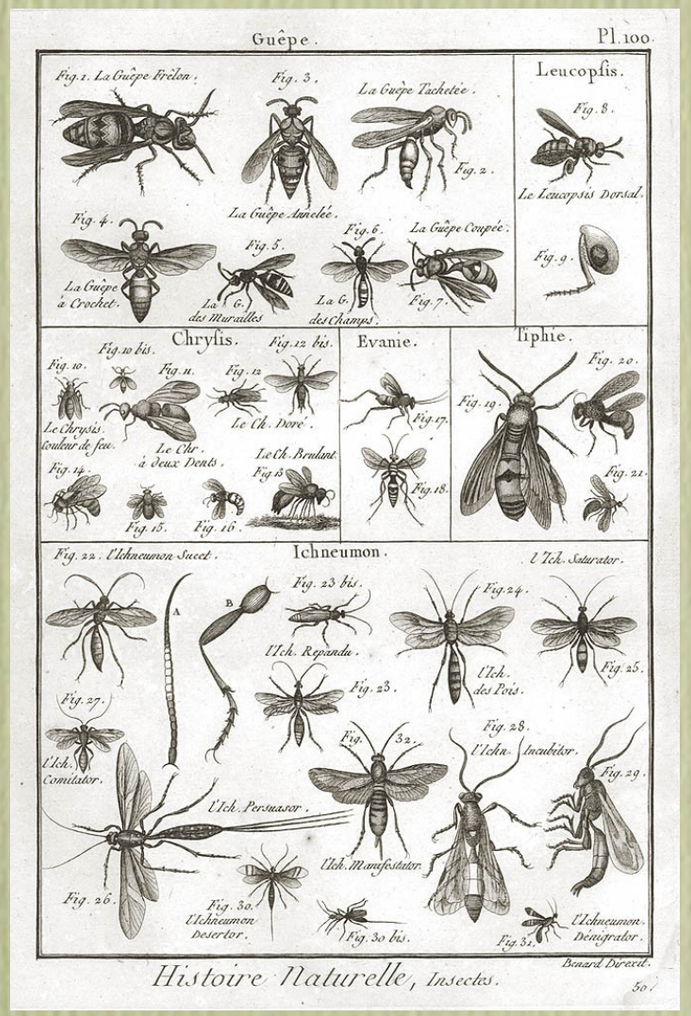
Rearchitecting Knowledge in the 1700s

- Scientific Revolution and secularization of philosophy offered powerful tools to find "truth" and a belief in [linear] "progress"—the essence of "modernism" (Note Shapiro article)
- Major breakthrough: Knowledge and information become increasingly "open-source"
  - Key tools for knowledge verification: publication and peer review
  - Texts replace symbols (relics, stamps, seals, etc.) as carriers of knowledge and information
  - Key notion of transparency, based in reproducibility of results in the scientific method
  - Concept of transparency gets transferred to the realm of politics, leading to demands for intelligibility and accountability
  - Emergence of compendia of propositional and procedural knowledge: Diderot & d'Alembert's *Encyclopédie*; Ben Franklin's work
  - A rage for classification

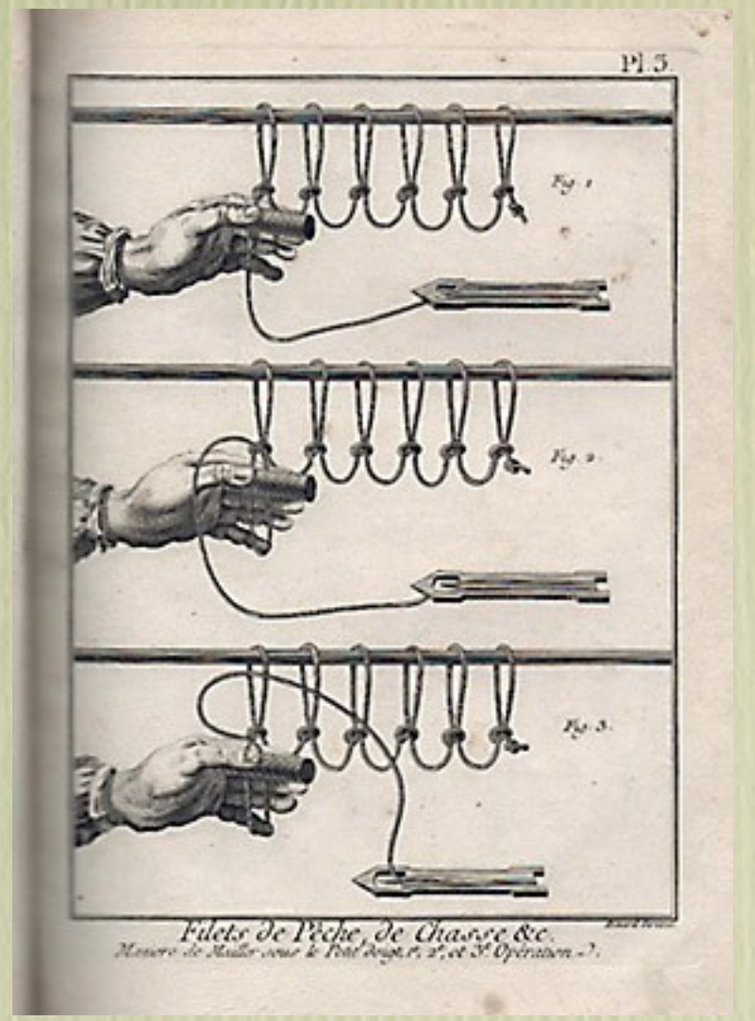
Removed:
The Tree of Diderot and d'Alembert
Detailed System of Human Knowledge
From Robert Darnton, The Great Cat Massacre *(New York: Basic, 1985), 210.*

Removed:
The Tree of Diderot and d'Alembert
Detailed System of Human Knowledge
From Robert Darnton, The Great Cat Massacre *(New York: Basic, 1985), 210.*

Two Basic Kinds of Knowledge



Source: Denis Diderot and Jean le Rond d'Alembert. Encyclopédie, ou dictionnaire raisonné des sciences, des arts et des métiers, 1751.



Source: Denis Diderot and Jean Le Rond d'Alembert. Filets de Peche, de Chasse,

Propositional: What is

Procedural: How to

Downsides/Caveats of the Rearchitecting

- Literacy still highly restrained, yet once one became literate, increasingly open access to texts
  - For procedural/technical knowledge, end of legitimacy for "trade secrets" held by guilds and organizations of skilled workers
  - Importance of new organizations and institutions: Ben Franklin's American Philosophical Society (1743) and the Franklin Institute (1824)
  - Importance of new, "useful" texts made the 19th century the golden age of the auto-didact—popular knowledge of technical information became a new path to upward mobility
- Distinction between propositional and procedural knowledge led to restrictions on the latter
  - Patents and the birth of a new notion of "intellectual property"
  - New restrictions to access of ideas with ownership

Broadening (& Racializing) Access to Information

- Newspapers, Zenger, and Poor Richard (1730s-1770s)
- Postal services (USPS as info & communication system)
- Public school movement & public literacy (1830s)
- Land-grant universities & extension services (1862)
- Public library movement & Yankee noblesse oblige (post-1880)
- The pulp-paper revolution (post-1880)
- Reading alone…
- Making the new racial and literacy divide after 1877: assuring Afro-American illiteracy & powerlessness
- A recent posting on slave illiteracy…

N Stands for ***Negro.*** To *be* all he *can*,
Without doing wrong, is the birth-right of man,
And noblest humanity evermore lies
In prompting and helping the lowly to rise.
Are Slaves dull and ignorant? Multitudes are:
Shall therefore the Master *improvement debar?*
Yet if to instruct them you open your mouth,
Beware of the penalty, down in the South!
—Can *that* be of God which for Slavery greed
Forbids you to teach a poor Negro to read?

Source: Gray, Iron. The Gospel of Slavery. New York: T. W. Strong, 1864.

From an 1864(?) publication, *The Gospel of Slavery*
electronically accessioned at New York Public Library, May 2005.

1900: The Information Society Emerges

- Immigrants, libraries, and assimilation
- RFD and the rise of advertising
- Family bibles, Gideon bibles, and circulating texts
- Records and the rise of the modern bureaucratic state and enterprise
- The twentieth-century dilemma: too much information? Information overload?

Librarians in the Comics

Removed:
Cartoon of a librarian from
Kirkendall 1986, 40-42

1) Quiet

2) Mean or Stern

3) Single/Unmarried/Unmarriageable

4) Stuffy

5) In Glasses.

From Erica Olsen, “Beehives and Sensible Shoes: The Horrible Truth about Librarians in Popular Culture,” PowerPoint presentation, 2001.

Librarians in Film

Removed:
Screen from
It's A Wonderful Life

Donna Reed in
It's a Wonderful Life

From Erica Olsen, "Beehives and Sensible Shoes: The Horrible Truth about Librarians in Popular Culture," PowerPoint presentation, 2001.

Removed:
Scene from The Mummy

Rachel Weisz in *The Mummy* (1999)

Removed:
Scene from Party Girl

Parker Posey in *Party Girl* (1995)

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The 2003 Librarian Action figure from Archie McPhee, Inc.

So what is the central and vital role librarians (and now, “information professionals”) play?

They fashion fuel for the collective brain of a society…

They build *social capital*

About “Social Capital…”

- What is it?
  - A richness of community and communication that empowers people socially (and, ultimately, politically and culturally) to develop their own abilities and “reach,” allowing upward mobility and political traction
  - Arguably, it’s what makes democracy work on the ground level
  - Perhaps its opposite is a society composed of automatons, windowless monads, or consenting robots (example: commuters in steel boxes traveling from gated communities to cubicles)
  - See Molz & Dain…
  - Built by and in civic & public spaces: public schools, libraries, concert halls, town halls, speakers’ corners…
- Popularized by Robert Putnam, *Bowling Alone*

Libraries, 1876-1920

- Birth of American Library Association, 1876—linked to movement toward professionalization (eg AMA, ABA, etc)
- Melvyl Dewey, the library movement, and systems of classification; the Carnegie irony
- Libraries and Progressives: Dewey meets Dewey (Melvyl and John)
- Library schools & the gendering of librarians: “respectable” positions for working women

To serve a literate citizenry…

Source: http://digitalgallery.nypl.org/nypldigital/id?434208

NY Public Library bookmobile, 1911:
Getting books to the people

To serve a literate citizenry (even more!)…

Source: Undetermined

Chinese-American Children at the Yorkville Branch of NYPL, ca, 1900

Libraries and Emerging Urban Culture

- Story hour
- Libraries as secular “fellowship” spaces; Joeckel and the branch system; ILL
- Recreational vs. edifying reading
- Librarians as public servants
- Melting-pot dreams and realities of upward mobility: the politics of library acquisitions
- [stereotypes]

Triumph and Crisis, 1945-80

- Libraries and the dream of self-education—were libraries to stand in for adult education? Comparisons to Germany and France…
- Federal funding rises and falls, 1967-1969
- Halcyon days for library schools, then the ironic crisis of women's expanded access to other professions
- Branch libraries and the hollowing of urban centers
- OPACs and the rise of Information Science; did libraries miss the boat?

The Crisis of Information Overload, I

- Birth of the modern corporation
  - From the Prussian Army to US railroads
  - The organizational chart
  - Information flows and power flows: keeping subordinates in line and selectively “out of the loop”
  - Max Weber and the birth of modern bureaucracy: records as virtual lives and the reinvention of “data doubles” (the first were 18th century police files)

The Crisis of Information Overload, II

- Calligraphy, typewriting, and the shift from clerks to secretaries; re-gendering business information: information professionals in business as baubles and prizes?

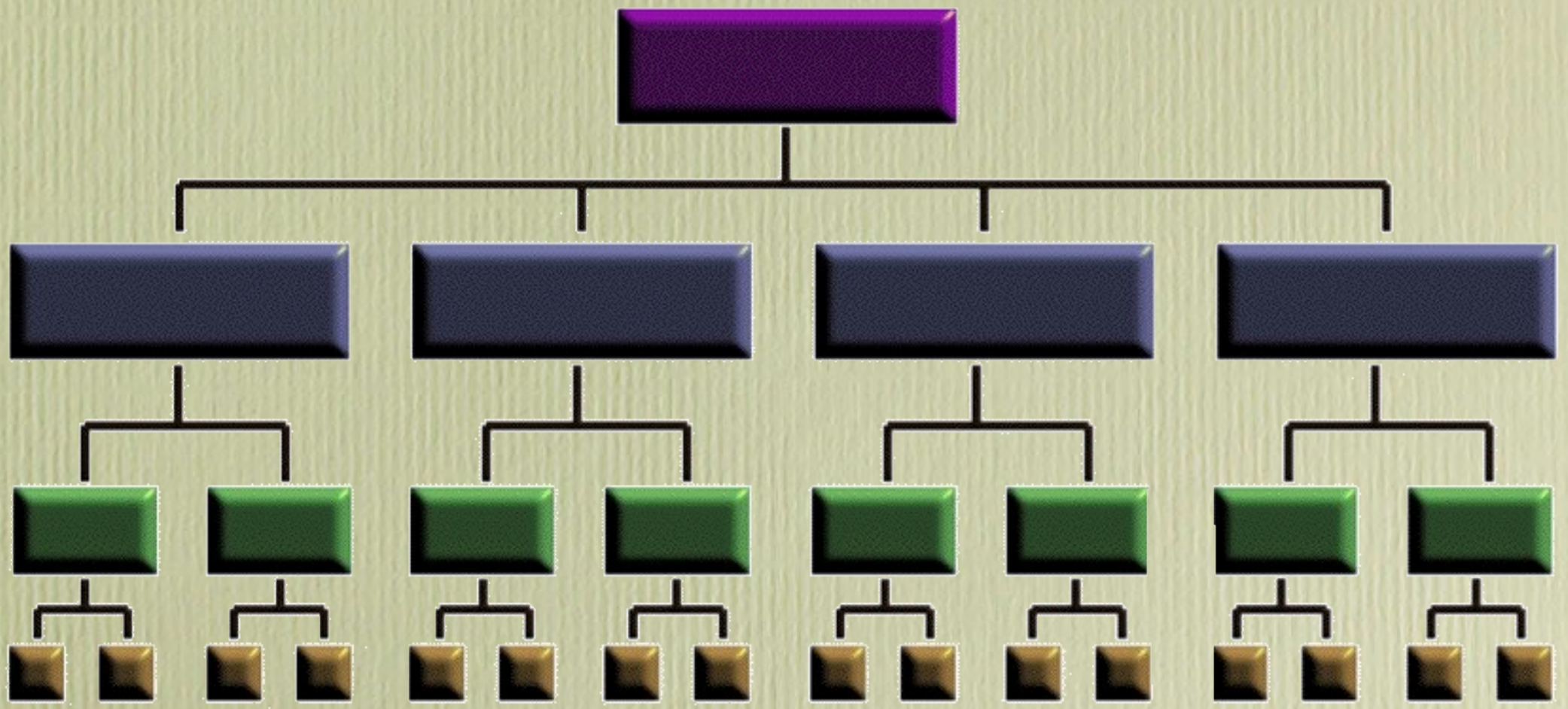
- Records private and public—limits on the right to know
  - Progressive-Movement (1900-1917) concepts of open, clean government—of “transparency”
  - Note the Anglocentrism

- Slow codification of records standards; late emergence of National Archives, 1936

- Immigrants, workers, and libraries

Your Basic Hierarchy…

name the organization/venue…



Source: Undetermined

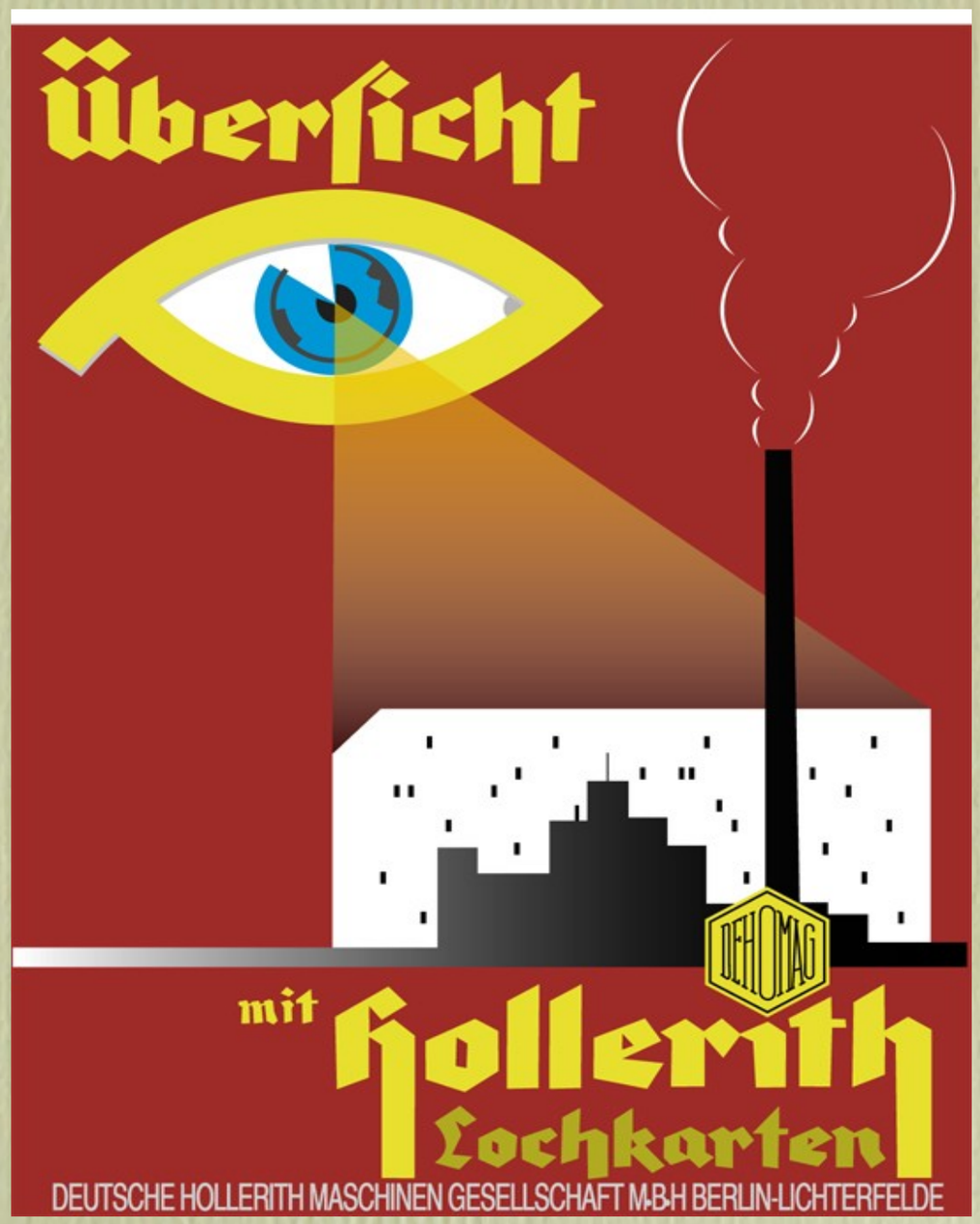
The Catholic Church, the Army, any corporation, knowledge, species, cataloguing systems…

Classifications and Cultural Hierarchies

- Classification schemes reveal cultural presuppositions and prejudice
  - “higher” and “lower” ideas/knowledge, species, races, jobs, and cultures
    - feudal roots in the “three orders” (clergy, aristocracy, everyone else)
    - Diderot’s “Tree of Knowledge”
    - obvious Euro- and Anglo-Centrism
  - Implicit in any hierarchical system of classification
    - Linnean species taxonomies
    - Dewey Decimal & Library of Congress cataloguing
- Post-“colonial” classification: CIDOC?

Information Science: A New Discipline?

- Hollerith, IBM, and tabulation: handling data
- 1937: American Documentation Institute; 1968: ASIS
- 1940s: Shannon/Weaver (signal/noise ratios), Vannevar Bush [statue of Shannon outside of EECS bldg.]
- A science of classification: hierarchies to relations
- From labels to meanings: computation in information retrieval—does labeling yield new knowledge?



Source: Undetermined

Information as Control:
A German Precursor to the Ministry of Homeland Security(?!)

Take-Aways on This Module

- The history of the spread of information and knowledge access is not linear, but it is about a growing democratization of knowledge
  - Information literacy:
    - builds social capital
    - supports an “informed citizenry” with libraries, schools, and wide access to useful (procedural) and real-world (propositional) knowledge
  - Several caveats to the positive path of growing democratization
    - the growing role of intellectual property restrictions (patents and copyrights) bars access to politically and socially important knowledge
    - Perhaps (a philosophical debate here) much of this notion of progress is based on naïve notions of truth, beauty, justice, and the like
    - hierarchical systems of information and knowledge classif cation overvalue traditional centers of power and violate the “horizontal” (person-to-person) set of social relations upon which democracy depends