

STS 007 Discovery of Prehistory

The history of prehistory: or, historical and scientific studies

How much development of modern science and modern historical studies are intertwined

**NB: Assign Steven Mithen, "Freedom Through Cooking," NYRB , Oct. 22 2009, 44-46.**

**Also assign "Fire as an Engineering Tool of Early Modern Humans"**

And how much this affects what we know and how we think about "technology in history"

Convergence of "natural history" and "natural philosophy"

You can see this today in your examples

Also in two optional readings on site for today – role of optional readings: giving you ideas for a project

Part of a very exciting convergence – limits to written documents – other types of documents: in the land and in biology, also in linguistics – from written to other material record – "deep background conditions" (Bernard Bailyn) - need to "cable together" different types of evidence (see Lewis-Williams reading for next week)

Archaeology, ethology, genetics, paleontology, anthropology, linguistics

e.g. Jane Goodall going to Kenya July 14, 1961, to work where Leakey had been digging – to live with chimpanzees, became another thread in the skein (not skeletons but behavior: ethology)

She actually took the time to study how chimpanzees live – they make tools, hunt animals, eat meat, and brutally kill members of their own species

But you need to contextualize it – put it with other evidence – genetics, linguistics, archaeology, geology, conventional documents as available, imagination most of all

Also: A long trend in historical studies to giving voice to the voiceless (women, children, workers...)

Uncovering "people without history"

"dark ages" as e.g.

Globe article: other examples: environmental history, neurological history, also ocean history (our own David Mindell) –

Deep background conditions: most salient one of all is length of time involved in human history

The discovery of deep space, “From the closed world to the infinite universe”

Esp. with galaxies (Kant, Wm Herschel) – even by late 1800s not entirely clear but possibility was recognized

Also deep time, a new world of the past, previously unsuspected, puts whole new lights on “technology in history”

The discovery of deep time is especially connected with the earth sciences/ geology

Common Western textual record:

Old Testament Biblical framework in Near East – pharaohs, Sumer, Babylon, Egypt)

New Testament ancient civilizations (Rome, Greece)

This is the record that Europeans saw: Bishop Ussher, 1654, 4004 BC as time of creation

Uncovering deep time began with cataloging minerals and fossils

Georg Bauer/Agricola from central Europe, many mines there (Hungary, Bohemia, Saxony) –

1494-1555, De Re Metallica 1556 (translated by Herbert and Lou Clarke Hoover 1912)

Hard to get evidence underground

Seemed jumbled, disorganized; minerals appeared here and there – order in the heavens but not on earth

Began mining academies in late 1700s – engineering school – schools of mining (even today: Paris, Colorado)

Abraham Gottlob Werner (1750-1817) – mining family – collected minerals

Neptunists vs. Vulcanists (Hutton) in 1780s –

Earth’s crust laid down when a primitive ocean subsided

Vs. volcanic action being main driver of change

But meant a testable hypothesis – strata laid down in orderly series – a universal stratigraphic column was agreed upon by 1800

How deep does it go? How does it relate to Biblical time?

Correlate geological and fossil record – “Fossil of paleontology” added to layers of rock esp. by Georges, Baron Cuvier 1769-1832

Excavations in Paris basin early 1800s – many quarries there: can still visit “the catacombs of Paris” (limestone quarry, also site for overflow from cemeteries)

Predictability of rock strata extended over 100 km

Specialist in comparative anatomy – first to reconstruct extinct animals from fragmentary remains – hippos, rhinos, cavebears, mastodons, crocodiles, tigers

“Le regne animal” (the animal kingdom) pub. 1817 – epic work – later editions, expanded, hugely influential – this is from the Paris edition appearing from 1836-1849 – hand colored (engravings)

Much larger and stranger animals too:

Mystery: how are these animals related to existing ones?

Cuvier a “catastrophist” – species are fixed, lifeforms succeed each other due to a series of sudden and overwhelming geological catastrophes - 27 in all – Noah’s flood the last one

Why not human fossils? Sinners who perished in the Flood? Would lie at the bottom of the deepest ocean, he believed – human fossils did not exist

“wrong” but like earlier argument (Neptune/Pluto) led to more research and agreement on basic point: mighty natural events in the past have laid down a geological record that is also a chronological record of earth’s past

Also, beginning to be clear that the scale of geologic time had to be long enough for seas to become land and vice versa

Race to fill in the stratigraphic column –

Charles Lyell, Principles of Geology 1830-33, first edition – stratigraphic table open at the bottom – great defender of “uniformitarianism” as opposed to a series of catastrophes

(Darwin took it along on the voyage of the Beagle)

Frontispiece to the book speaks of not-so-deep time (columns from classical antiquity)

Different classes of rock, many processes that over a long time results in what we see

William Buckland 1784-1856 – chair in mineralogy at Oxford – pioneer in cave research

Also believed in floods, but not so catastrophic

Did not believe fossil human would be found – nor did Lyell – assumed humans were “non-fossilized apex of creation”

Long known that caves in Europe sheltered bones of species that no longer existed or no longer lived in the area - wouldn't animals trying to escape the flood take refuge there? Bones would be preserved esp. in limestone caves where water dripping from the roof would cover the bones with a protective coating of stalagmite

Started exploring caves in Germany in 1816, also worked in UK – very careful work

Reliquiae Diluvianae (relics of the flood) – 1823 “Observations on the Organic remains contained in caves, fissures, and diluvial gravel, and on other geological phenomena attesting the action of a universal deluge”

But no human fossils – he was eager to find this as evidence of the Mosaic Deluge

Goat Hole Cave, in south Wales – human-like skeleton found there – sketch from RD – Buckland wrote in RD that it was relatively recent, maybe Roman times

Next year a Roman Catholic chaplain working at Oxford, interested in excavations, flint and bone tools found next to bones of extinct animals (mammoth, cave bear) in Kent's Cavern, Devon – sealed beneath limestone – Buckland insisted that “ancient Britons” had lived in upper levels of cave, scooped out “ovens” in the stalagmite, their tools had fallen down the holes

Similar reactions to caves along the Meuse/Maas, where implements (ivory, flint, bone) and a human skull found along with bones of extinct animals

Wanted to find human remains, but these were mixed with fantastic animals, unmentioned in scriptures, bizarre forms of life – never let go of belief that humankind was not changing, would be no fossils found – humans relatively new

Time of great uncertainty – good reason to be skeptical in reading too much into scattered remains

Many other excavations going on, in UK and Europe, including more findings of intact bone caves, with flint knives below a bed of stalagmite in which the bones of mammoths and cave bears were found

Neandertal remains 1820s (baffling), 1848, also 1856 (skulls uncovered in earlier decades, 1820s and 1840s, simply called “ancient humans”) the 1856 skeleton was more complete – puzzling: remains scattered by workmen in the quarry, no animal remains found with it, age unknown

Strange shape of the skull: low narrow forehead, large ridges over the eyes, thick cranial bones, knot at bottom of skull – suprainiac fossa, a groove above the inion, the place on the bone at the back end of the human skull that juts out the farthest (occipital bun)

Key event: French researcher Jacques Boucher de Perthes had been collecting items esp. hand axes from river gravel dredging in northern France, including a stone axe buried in an antler – two Englishmen visited, Joseph Prestwich and John Evans, both amateurs, businessmen, but obsessed with mapping surface deposits known as drift – now glacial drift – visited gravel pit near Amiens (Jules Verne living in the neighborhood, very interested in this kind of scientific discovery, *J to Center of Earth* 1864) – Boucher de Perthes was old, didn’t have credibility –

they were esp. interested in an object that lay 17 feet underground, four and a half feet up from the base of a river terrace cut into a chalk slope – the edge of a worked flint tool – first to be fine in situ, in gravel that also had bones of woolly rhinos and mammoths – they asked three local reps of the Society of Antiquities of Picardie to witness this –

photograph of breaking the time barrier – 27 April 1859

not clear who the people are – one pointing to the flint tool

returned to UK – planned their scientific attack – spoke first to Royal Society May 26 (Faraday, Babbage, Huxley and Lyell in the audience) – then Society of Antiquities of London, then Geological Society

Lyell changed his mind about great human antiquity, visited the Somme – St. Achuel is the site, so Acheulean tools

Lyell announced this at a meeting (packed) of the British AAS, with Prince Albert there: “A vast lapse of ages...[separates] the era in which fossil implements were framed and that of the invasion of Gaul by the Romans.”

A month later in 1859 *Origin of Species* is published – sidesteps human evolution, which was dealt with later in *The Descent of Man* 1871 –

But Darwin’s friends and allies almost immediately recognized the implications, that humans too had evolved –

Lyell presented a skull to Huxley, who “remarked at once that it was the most apelike skull he had ever beheld” –

Huxley 1863 Man's Place in Nature – long discussion of the skull, refuting those who thought it was that of an “idiot,” Cossack or “powerfully organized Celt,” i.e. it resembled the skull of a modern Irishman with low mental organization

Huxley insisted it was that of an apelike human: “it is singular how often the dream [of ancient traditions] turns out to have been a half-waking one, presaging a reality....though the quaint forms of centaurs and satyrs have an existence only in the realms of Art, creatures approaching man more nearly than they in essential structure...are now not only known, but notorious.”

Science had led not to Biblical history but to a previously unknown history, which tested humankind's sense of identity and specialness as never before

Image of the skull: imagination, consciousness of prehistory – like Galileo turning telescope to the moon: new things never before seen, man's place in nature, heavy-browed, heavy-jawed

Who were they? How did they live? What does this mean? Skull doesn't tell you this –

1864 discovery of a piece of ivory drawn with a hairy mammoth in La Madeleine, nearby

In 1868 railway line (progress!) being put in near Les Eyzies – involved blasting open a rock shelter in a cliff – found 4 skeletons like those Buckland had found in Kent's cavern – tall, large brained (Neandertals also), long-headed – formally buried with pierced shells and other ornaments - called Cro-Magnon after the rock shelter

Became clear the Cro-Magnons had succeeded the Neandertals

Sir John Lubbock, Prehistoric Times 1865 – widely read – “of late years a new branch of knowledge has arisen, a new science has....been born among us, which deals with times and events far more ancient than any which have yet fallen within the province of the archaeologist...Archaeology forms the link between geology and history.”

New science, new word, railway line, “technology” emerging as a concept: all happening at once

Serious excavations in Kent's Cavern, 1865-1880 – calculated from stalagmite growth rates that stone tools under them were half a million years old – then sold to family 1903, used as a workshop and then a tourist attraction – during the cave tours lights are turned off, stone age shell lamps are used

Discovery of cave art

See preface to Lewis Williams: record of entrance into Niaux 1660, tourist attraction, natural wonder – leaves name and date on wall, a meter from images of bison and ibex – images all over the wall, don't seem to get much attention

Like the word “technology” – it is there but no one pays much attention

“rediscovery” begins 1861

Altamira 1879 – could be a hoax

1895 disc. Of La Mouthe near Les Eyzies – sandstone lamp found

Authenticated 1902, retraction of views on Altamira

Picasso: after this, art is just one long footnote

Abbe Henri Breuil

Juniper Fuse

The beginning of imagination

And of separation of human from other animals – projecting it on the cave walls

Tools can produce images: great discovery (Eschleman xvi)

Again riddle of consciousness – Descartes, brain-mind problem (see article about brain activity)

Mystery of motivation

symbolic capacity: what does this mean?

Paabo on questions for which we will never know the answer

Discovery of imagination?

Lewis-Williams on shamanism: the mind in the cave, the cave in the mind - hypothesis

Varied stages of consciousness

Looking for common neurological equipment

Geometrical and animal/representational images

Entoptic – within the eyeball – particles in vitreous liquid or shadows of retinal blood vessels falling on retina

Spiritual world exists, it's tangible

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