

STS.007

Notes for class 7

Neolithic Revolution

History and Technology

Technology in history: agriculture, cities, states

If you think of “technology” as industrial production, it seems off topic

“ecosystem engineers” – why I handed it out – a reminder of the varieties of engineering

Agriculture as an entirely new way of interacting with flora and fauna of the world for human ends, productive and reproductive

“bioengineering” – not just genetics but redoing agricultural production – green revolution – GM foods – animal breeding and cloning (Dolly) (we will get back to this at the end of class)

Also though engineering not as production of goods but production of space – a humanbuilt world – civil engineering – along with military engineering, oldest branch

Organization of space through creation of pathways and centers – bridges and dwellings (Heidegger) – “second nature”

Machines vs structures: Billington has complained about bias of engineering history on former, not latter, which are highly visible, massive, relatively permanent, slow to evolve, and site-specific -

Agriculture is both: food production and shaping the world

Seismic scale of revolutions: this is the big one, should be the standard against which to measure

Everything changed: physical health: organization of society: gender relations: ideas?

And still a mystery – so many elements – so many trade-offs

Cutting edge: How knowledge and perspectives keep changing – research ongoing

Basic questions: how revolutionary was it? Certainly in results, but how sudden?

Gordon Childe, 1936, Man Makes Himself

UP initials - Paleolithic to Neolithic Revolution: not just stones but a whole new system of life

Changes since then: a gradual economic transformation, most communities not pristine hunter-gatherers nor full-fledged farmers – ec evolution not cultural revolution – most people hunter-gatherers-cultivators

The story of agri is much more complicated and interesting than had been imagined

A long and winding road

“people were messing with plants for a very long time”

Sequence theory: domestication, then sedentism

Now: Sequence: sedentary life came before plant domestication; then animal herding and use of pottery – in Near East

Not so in Americas

e.g. Mexico, squash and maize/corn domesticated while people were still completely mobile, not sedentary

Also, dissemination (note word) or independent discovery?

Diffusion theory

Now , simultaneous invention of agr. ca. 11.5 BP

Mithen’s talk last spring

“One of the most astonishing features of human history is that agricultural economics arose quite independently during the early Holocene in several different regions of the world.” (Mithen 49)

Science handout

Look at map in Science article

His conclusion: there is “immense variety of pathways that led to farming in different parts of the world”

e.g. in North Africa animals domesticated before plants

e.g. in China pottery invented along with domestication of rice, but long before farming and sedentism in Japan

e.g. cereal farming spread rapidly from China and Western Asia

whereas roots, tubers, vegetables in New Guinea and Central America remained localized
e.g. Australia remained hunter-gatherers until whites arrive
e.g. mystery how indigenous African plants became domesticated

Mithen: three requirements: not just end of ice ages (After the Ice)

Climate – distinct increase in temp and rainfall that begins the Holocene (11.5 BP)

Environmental resources

Mind: fluid, imaginative mentality of modern humans

Western Asia has by the the most and best quality evidence (climate)

Kathleen Kenyon at Jericho in 1950s –

See: http://www.archaeowiki.org/Kathleen_Kenyon

Near Jordan river on West Bank – well below sea level (820 feet, 250 M) – east west route north of the Dead Sea – near current town by that name

See: <http://www.archatlas.dept.shef.ac.uk/OriginsFarming/Colledge/Slide18.jpg>

Near salt and flint trade routes

One of the oldest human habitations

Importance of methodical excavations – many layers

found mud-brick circular dwellings; cultivate wheat and barley on alluvial soils of Jordan Valley? Probably collected wild seeds rather than planting them – scythes with flint edges and bone handles; stone mortars to grind seeds

but no ceramics/pottery (PPNA: pre-pottery Neolithic A) – round huts Mudbricks – not fired but dried in sun – clay, mud, and water mixed with a binding material such as straw, or rice husks -

combined hunting and gathering with crops – also burial customs: secondary (exhume skulls of the dead, maybe display for a while, then rebury)

“type site” settlement – a couple thousand

See: <http://www.biblearchaeology.org/image.axd?picture=Life-on-the-Edge-WEB.jpg>

Walls – 2 meters wide – huge tower 9 meters in diameter - large tower – granary? (not Joshua’s tower) – storage bins of stone or mud-brick – not evidence of serious warfare then – protect salt?

See: <http://www.archaeology.org/online/reviews/kenyon/thumbnails/kenyon6.gif>

Interesting proposal: building makes people settle not the reverse (we'll return to this)

See: <http://www.bible-architecture.info/Jerich4.jpg>

Typical tools – “lithic” industry (blades) – flint – striking a long narrow flake from a stone core – also sickles (gather while you cut) and arrowheads – axes or adzes, to smooth wood – hatchets or axes to cut wood – weave mats – spears, flint-tipped arrows

Others found in West Bank area, but Jericho seemed unique

See: <http://www.hadashot-esi.org.il/images//5188-9.jpg>

See: http://www.absoluteastronomy.com/topics/Pre-Pottery_Neolithic

More recently similar sites in in southern Jordan – to the south – more recently to the north in Syria and Turkey – these are villages in Lowlands – PPNA more widespread than had been believed

Key questions concerning the extent to which wild plants were cultivated and animals managed, whether communities were mobile or sedentary, and the nature of cultural developments remain unanswered.

In Wadi Faynan site 16

See: <http://www.antiquity.ac.uk/projgall/finlayson319/images/figure1big.jpg>

See: <http://www.reading.ac.uk/web/MultimediaFiles/ARCH-WF16-2.JPG>

To learn more about WF16, see: [WF16 at the University of Reading](#).

See: <http://www.antiquity.ac.uk/projgall/finlayson319/images/figure2big.jpg>

See: <http://www.antiquity.ac.uk/projgall/finlayson319/images/figure3big.jpg>

Found circular dwellings stone technologies– working reeds, wood, hide, stone – seem to have made clothing, traps, cages, stone beads, wood artefacts, maybe goat pens

Also animal bones, wild goat, surprisingly small, a sign of domestication, rather than wild flocks, or some partial domestication

See: <http://www.antiquity.ac.uk/projgall/finlayson319/images/figure4big.jpg>

secondary burials

To learn more about the excavations at WF16, see: [Finlayson's comments in Antiquity](#).

See: <http://www.antiquity.ac.uk/projgall/finlayson319/images/figure5big.jpg>

For details and images of artifacts found at the site, including explanations of the above skeletons, see: <http://www.antiquity.ac.uk/projgall/finlayson319>

And acceleration of change: emergence of different time scales - in “B” there were two-story multi-roomed rectangular buildings, with polished lime floor – houses 7 meters by 7 meters – ceiling of reeds and mud (ca 5500 BCE)

Pottery comes – rough, primitive, geometrical figures – 4000 to 5000 BCE

Then Bronze age sometime in 3000 BCE (copper; walls; Bedouin raiders)

Now we are back to map we started with

Cities, states, “civilization,” all the British Museum stuff....

Progress? “civilization and its discontents” – defending territory; health; economic surplus leading to social differentiation

Christian assumes a long period before this happened

Now not so clear: Gobekli Tepe in southeast Turkey discovered in 1960s

See: <http://www.viewzone.com/g.geography.jpg>

In the hills not lowlands – a limestone hill, 300 m in diameter, ca. 15 m high, with round-topped knolls on it (“hill with a potbelly” in Kurdish)

Would be a lovely view: rivers, animals, trees, fields, mild climate, arable land...

See: http://media.smithsonianmag.com/images/gobeklitepe_nov08_631.jpg

5000 years older than Troy (found in late 19th c)

About same time circular dwellings of Jericho were being built, ca 9600 BC – people carved T-shaped pillars out of limestone bedrock – 8 ft high, 7 tons, within circular buildings sunk into the hill -

One acre excavation only 5% of site

Circles range from 30 to 100 feet in diameter, surrounded by stone walls about 6 feet high –

Many layers –top one shows agricultural activity – one below that is PPNB (7500-6000 BC) surveys (ground penetrating radar, geomagnetic surveys) suggest 16 more structures/rings yet to be unearthed under 22 acres – upper levels are less large, some rectangular structures - the earlier you go down the more monumental they are - suggest several millennia of activity -

carved to display wild animals, typically dangerous ones: lions, ducks, scorpions, ants, spiders, snakes, vulture, boar - one with human arm –

staggering labor – flint flakes all over, from tools used to carve the stone, which was in soft limestone outcrops - could shape them into pillars there, carry them a few hundred yards to the summit, lift them upright – source was several km away – no metal tools, no pottery

No hearths, no trash heaps, no houses, no clay fertility figures – Instead, lots of gazelle bones (60 % total) People who relied on wild game and plants – nothing domesticated, no domestic buildings – had to be a ritual center – another similar site in Syria, with similar symbols – also similar to a Neolithic site in central Turkey

“First came the temple, then the city”

Networking center? Hunter gatherers came to council?

Maybe wheat was domesticated to provide sufficient food for those who worked and gathered in Gobekli Tepe, and when people dispersed back to villages, maybe they took seed grain with them – so maybe wheat was not domesticated as result of struggle vs. harsh climate before global warming at 9600 BC: maybe a by-product of ritual gatherings in southern Turkey

For images, see: <http://www.viewzone.com/turkeyx.html>

<http://www.smithsonianmag.com/history-archaeology/gobekli-tepe.html#>

<http://www.philipcoppens.com/gobekli.html>

Apparently when rings were done, the early Neolithic peoples deliberately buried these ritual buildings below several tons of soil – and then placed another ring near or on top of the old one

See: http://www.philipcoppens.com/gobekli_5.jpg

So ideology went hand in hand with changes in the economy

Right on the edge: had wild sheep and wild grains

Within 1000 years, sheep, cattle and pigs had been corralled –

Just 500 years later there is evidence of domesticated strains of wheat

“Sociocultural change comes first, agri comes later”

So what is going on? Fragments of human bone in layers of dirt – floors of rings are hardened limestone – Burial ground, death cult?

Stone circles are familiar – but this one is about 7000 years before Stonehenge was built

More time separates these two structures than separates Stonehenge from us

To learn more about megaliths like the circles found at Gobekli Tepe and Stonehenge, see:
[Megaliths](#)

First Sumerian clay tables 3300 BCE

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<http://ocw.mit.edu>

STS.007 Technology in History
Fall 2010

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