Neandertals 2.0
Part 3

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by

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This month:

- N hunting strategies
- N life histories
- Ns as stone artisans
- N healthcare

Neandertal hunting strategies

Neanderthals as top-level team hunters

- A new array of methods, and a growing awareness of bias due to outdated excavation and collection standards, has brought our perception of Neanderthals into much sharper resolution.

- Neanderthals were top-level team hunters.

- They took on large animals including bears, rhinos and mammoth, using finely honed wooden spears for close-quarters jabbing; others were thrown as javelins.

Hunting

- Hunting was the main method of meat procurement by Neandertals.
- Extremely successful ambush hunters and trapping animal herds
  - Thrusting spears with tar glue hafted stone points
    - Hunted cave bear, deer, woolly rhinoceros, mammoth, wild cattle, reindeer, horse, wild ass, ibex, saiga, goat
    - Hunted in both woodland and steppe

N hunting

- The myth of speedy critters such as birds or rabbits being out of N reach has been crushed, and seafood was definitely on the menu.
- Strand-line gathering (where debris is stranded at high tide) was practiced, whether for shellfish or the odd washed-up marine mammals, and maybe freshwater fish.
- Presence of twisted fibers implies likely use of snares

N Hunting

- N Hunting strategies:
  - picked specific species,
  - picked best animal from that species,
  - hunted them,
  - butchered them at kill sites,
  - took best parts to home sites, esp. fats,
  - made sophisticated use of environment in hunting – used dead end canyons; use of waterholes, lake sides, and mineral animal lick sites to hunt

N hunting

- N were top predators & hunters;
  - tracking is a sophisticated cognitive capacity involving predictive thinking:
  - Requires data gathering, hypothesis revision, anticipation and prediction of animal behavior; understanding theory of mind of animal
- Animals as bone quarries- not only lean meat, but fat, marrow; N had klg of specific bones – tools for knapping stone – which for retouching
- Ns were super selective

Hunting

- Hunting style differences on steppe, dense forests, canyons
- Animal tracks are graphic symbols, representing particular animals; also how long tracks had been there; modern HGs can id particular animal by their footprint
- Speculative/predictive hunting – animal tracking evolved by 2 Ma; predicting animal behavior by 100 Ka
- Communication during hunting: hand signals, vocal communication – complex hunting requires language

Homo neanderthalensis

- Used large multicomponent spears. Classically Ns were considered ambush hunters, but also clearly used topographical traps
- Abundant evidence for hafting on Levallois & Mousterian points & scrapers; some of lithic material came from up to 30 km away.
- Theory that Ns did not typically engage in long-distance trade is now disputed.

Neandertals and River valleys

- Ns led a nomadic hunter-gather way of life; did not just hole up in caves
- Use of rivers/lakes for hunting: excavations indicate Ns used rivers and lakeshores where animals were drinking to hunt them
- Ns used various sites at different times of year;
- Clearly knew their animal prey; their seasonal behavior, movement patterns

N hunting

- Neanderthals resemble carnivores like wolves or hyena with high nitrogen signals. Nitrogen Isotopes give an idea of their predator diet niches - who was eating what.

- Some Neanderthals, including those at Spy, Belgium, appear to have been getting between 20 and 50 per cent of their animal protein from mammoth.

- Rather than focusing on big game, however, what defines Neanderthal hunters is their refinement of a nomadic way of life going back more than 300 thousand years.

N hunting

- They went after almost all sizeable prey in their local range, adapting to big species and medium-sized game.

- The diversity of habitats and behaviors represented by animals like ibex, gazelle, wild ass, boar, chamois, birds, means Neanderthals mastered many specialized hunting strategies.

Hunted large species

- Large species:
- Neumark-nord: 100 massive mostly prime age fallow deer stags;
- Neumark-nord: 70 straight tusk elephants (who each weighed 28 K lbs)
- Schöningen: 1100 lb horses
- Leiningen, Newmark-nord: elephants
- Lynford Quarry, Britain: 11 mammoths
- La Cotte de St. Brelaide, Jersey: 18 mammoths, and wooly rhinos stacked skulls & ribs vertically vs vertical rock wall
- Spy, Belgium: baby and very young elephants
- Syria: wild asses
- And every other available species

Neanderthal Hunting Weapons Re-Assessed

M. Lombard, M. Moncel, 2023

- 2023 Study provide an overview of stone-tipped weaponry used in south eastern France between MIS 7 (246 Ka) and MIS 3 (57 Ka). Analyzed stone points from 3 sites: Abri du Maras, Saint-Marcel, Grotte du Figuier, and Payre.

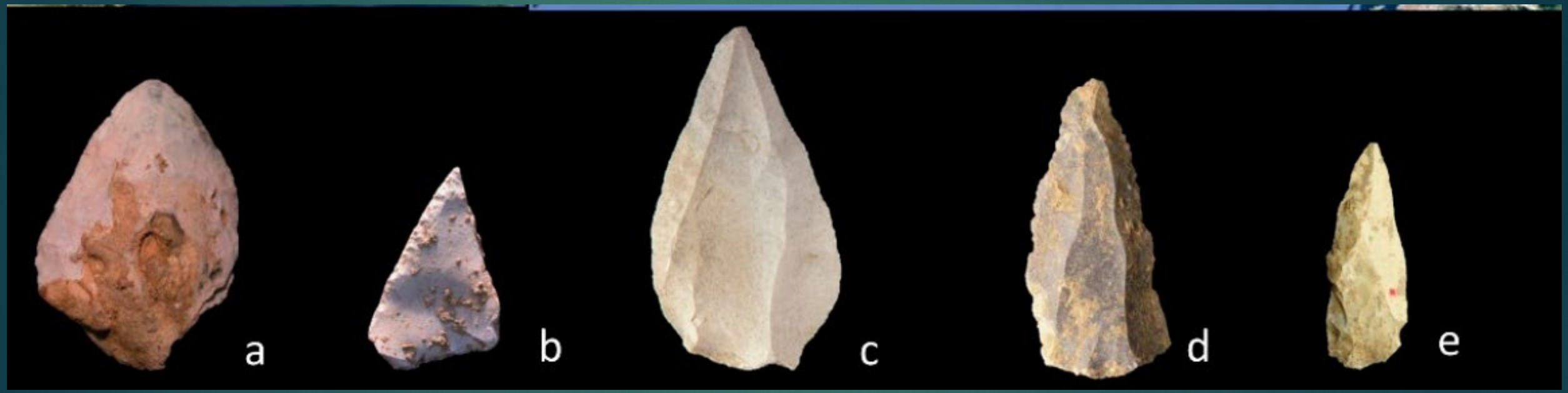
- Suggests that early Neanderthals may have hunted with
  - bimanual thrusting spears in combination with
  - one-handed stabbing spears, but that
  - later groups possibly introduced javelin hunting to the Neanderthal arsenal.

Types of spears Ns used

- One-handed stone-tipped stabbing spears stand out as the Neanderthal weapons of choice throughout the Middle Palaeolithic

- Suggests:
  - Similarities in hunting with stone-tipped weapons between Neanderthals and *H. sapiens* before MIS 5 (130 Ka),
  - marked differences during MIS 5–4 (130-71 Ka),
  - but similarities again during MIS 3 (57 Ka).

Varying spear points from the oldest Payre at MIS 7 (a,b), 246 Ka, and youngest Abri du Maras, MIS 3 (c-e) 57 Ka, assemblages



N hunting

- Neanderthals hunted prey, scavenged from predators and probably harvested weakened, trapped or recently dead animals.

- They pursued and killed large prey such as elephants with wooden spears, and herding ungulates such as horses with stone-tipped weapons.

- Hunting with stone-tipped weapons was pervasive throughout southern Europe as part of organized Middle Palaeolithic subsistence strategies.

Ns: excellent tacticians, casual executioners & discerning diners .

- Neanderthals coordinated their hunting behaviors to exploit game that congregated in large herds

- White et al. reconstructed the paleo-landscape and animal ethology by showing that
  - Neanderthals did not necessarily pre-select and isolate individual animals from a herd to pursue and kill—in the way many current hunter gatherers do.
  - Instead, they ambushed whole herds, slaughtering at random amongst the animals.

N herding

- When it came to processing the carcasses for transport and consumption, however, they were highly selective.

- It thus appears that Neanderthals were
  - “excellent tacticians,
  - casual executioners, and
  - discerning diners”.

Steven Mithen on N hunting

- Mithen, the great European archeologist, wrote in 1999 the following about Neanderthal hunting: “It is widely thought that their main hunting weapons appear to have been short thrusting spears, tipped with stone points. The points themselves required considerable skill to make, but the weapons themselves remained quite simple in design. With such weapons, the Neanderthals appear to have frequently used a confrontational hunting technique. This seems to have been a major cause of the high frequency of bone fractures found on Neanderthal skeletal remains and the high mortality of young adults. Why Neanderthals did not invent more effective hunting weapons and methods to avoid such injuries remains unclear. We have no evidence for throwing spears, for bows and arrows, for spear-throwers, for pits, traps and snares”.

- His opinion has proven to be historically inaccurate.

5 hypotheses about N hunting strategies

- Lombard et al. analyzed seven stone point assemblages from sites around the confluence of the Rhône and Ardèche-Payre tributaries on the south eastern margins of the Massif Central Mountains in France.

- The assemblages include stone points from 4 sites: Abri du Maras (MIS 3 and 5), Saint-Marcel (MIS 3 and 5), Grotte du Figuier (MIS 3–4), and Payre (MIS 6 and 7).

- Used statistical methodology (TCSA) to assess presence and effectiveness of N stone technologies

- Produced testable hypotheses to assess the following assumptions about Neanderthal hunting weapons:

5 hypotheses about weapon types

- 1. Neanderthal stone-tipped weaponry was limited to double-handed thrusting spears.
- 2. Neanderthals used stone-tipped spears for both thrusting and short-distance throwing.
- 3. Neanderthals did not make or use mechanically projected technologies such as the spear-thrower and dart or the bow and arrow for killing at a distance.
- 4. Neanderthals used string-thrown darts.
- 5. Neanderthal weapons were similar to those used by broadly contemporaneous *Homo sapiens* hunters in Africa.

Assumption 1: Neanderthal Stone-Tipped Weaponry Was Mostly Limited to Double-Handed Thrusting Spears

- Some N pointed stone artefacts and wooden spears are best-suited ballistically for use as bimanual thrusting spears.

- In south eastern France, such tips are relatively frequent in the MIS 7–5e (130-115 Ka) assemblages, where they constitute the second-most represented weapon-tip type after one-handed stabbing spears.

- Bimanual thrusting spears become less frequent in the later Neanderthal assemblages.

N used different types of spears

- Early Neanderthal groups may have hunted habitually with bimanual thrusting spears, but not exclusively, especially after 115 Ka.

- Instead, strategies around stone-tipped weapon use amongst Neanderthal groups changed through time to also include other approaches to spear-hunting.

Assumption 2: Neanderthals Used Stone-Tipped Spears for Both Thrusting and Short-Distance Throwing

- N used of bimanual thrusting weapons and single-handed stabbing spears that can be thrown effectively over short (< 10 m) distances.
- There were more artefacts suited for single-handed stabbing spears than any other weapon-tip category
- The four younger assemblages however, follow a different pattern wherein tips best-suited for javelin hunting becomes the second-most represented category.

N used throwing spears

- There was a development in hunting strategies in the southeastern France from contact or close-quarter hunting to hunting from a relatively safer distance.

- This trend also played out elsewhere in Europe and the Levant during MIS3.

Advantages of single-handed spears

- Adaptive advantages of hunting with single-handed stabbing spears or assegais:
  - Before the recent introduction of firearms to Africa,
  - various types of single-handed spears (assegais)
  - represented the bulk of hunting and warfare weaponry across the African continent because of the effectiveness and flexible nature of this weapon.

- In hunting scenarios single-handed stabbing spears:
  - (a) Provide better balance and movement to weapon-yielding hunters compared to large and heavy bimanual thrusting spears;

Advantages of single-handed spears

- (b) Provide enough shaft and tip strength to stab powerfully and effectively at dangerous antagonists without hunters losing their weapons;

- (c) Can be flung from a short distance providing some flexibility in risk management;

- (d) Free up one hand to carry a backup or defense weapon such as a club or another spear or spear type.

Eventually preferred stabbing-spears

- The communal success of such social weapon-use strategies may explain why the stabbing-spear category became the preferred weapon for Neanderthal groups at least since MIS 7 (240 Ka).

- Stabbing spears may have been used in tandem with bimanual thrusting spears early on, and later together with lighter javelins that could be thrown over longer distances.

- Habitual javelin hunting only appear later in the Neanderthal record, and most often at sites without corroborating N fossil remains.

Assumption 3: Neanderthals Did Not Make or Use Mechanically Projected Technologies (Spear-Thrower and Dart or the Bow and Arrow) for Killing at a Distance

- There is no definitive corroborating evidence for spear-thrower use in the Neanderthal record, we must follow a parsimonious interpretation that the data is most consistent with javelin hunting.

- It cannot be claimed that Neanderthals hunted with long-distance weapon systems such as the spear-thrower and dart or the bow and arrow—instead, the possibility of javelin hunting requires more exploration.

- But recall that neither did African sapiens in Europe, until after 12 Ka.

Assumption 4: Neanderthals Used String-Thrown Darts

- There is little to no corroborating evidence for spear-thrower use in the Neanderthal record.

- Hardy et al.'s interpretation that twisted fibers observed on a few small, pointed artefacts may be seen as proxy evidence for Neanderthals hunting with string-thrown darts at Abri du Maras during MIS 3. But the string could have simply been used to tighten javelin tips in their shafts.

- There is currently no supporting evidence for the use of darts or arrows at any Neanderthal sites; but together with the presence of small game such as rabbits, the Abri du Maras assemblage can be considered a 'smoking gun' for the use of complex hunting technologies.

Assumption 5: Neanderthal Weapons Were Similar to Those Used by Broadly Contemporaneous Homo sapiens Hunters in Africa

- Evidence for similar weapon-assisted hunting behaviors for *H. neanderthalensis* in Europe and the Levant and probable *H. heidelbergensis* and early *H. sapiens* groups in Africa before and until roughly MIS 6 (191 Ka).

- By then both groups seem to start experimenting with lighter javelins, whilst still depending heavily on the stabbing spear.

- For MIS 5 (130 to 71 ka), Neanderthal weapon use in Eurasia was not the same as that of *H. sapiens* in Africa. During this phase, African *H. sapiens* weapon-assisted hunting strategies became more variable, possibly in response to climatic oscillations between the interglacial and glacial substages.

N and MH comparison

- During the later glacial MIS 4 (71 Ka) there were clear differences between African *sapiens* and the contemporaneous Neanderthals.
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- During this phase it seems that the bow and arrow became the weapon of choice in southern Africa, supplemented with javelins and some stabbing spears.

- By MIS 3 (57 Ka), hunting with stone-tipped weapons became largely variable in both Neanderthal and H. sapiens populations.

Weapon changes between 243 and 29 Ka

- Summary: In southeastern France, between ~243 ka and ending by ~29 ka: stone point assemblages indicate a variety of transitions in spear use

- Early Neanderthals probably hunted with both bimanual thrusting spears and single-handed stabbing spears.

- Early Neanderthal population probably adapted their spear-use strategies (relying more or less on bimanual thrusting and single-handed stabbing) according to prey type and hunting season.

- The adaptive advantages of using smaller stabbing spears, and the fact that they could be thrown more effectively over short distances, seems to have encouraged experimentation with lighter javelin-type weapons, perhaps starting as early as MIS 6 (191 Ka), but becoming increasingly pronounced in later populations.

Use of javelins and projectiles

- During MIS 3 (~57–29 ka): show a tendency towards hunting with lightweight javelins or even darts and/or arrows in combination with single-handed stabbing spears.

- But most of these assemblages are not directly associated with *H. neanderthalensis* fossil remains.

- Need different cognitive abilities: the ability to throw objects from a distance at high speed and with great accuracy, and neurocognitive underpinnings associated with the ability to mentally map force transmission through time and across space. The latter requires effective visuospatial integration associated with brain areas such as the precuneus that expanded to its full capacity only in H. sapiens by ~ 100 ka , when we see TCSA data showing an increase in possible javelin use in southern Africa associated with a H. sapiens population only.

Ahead of the Game: Middle and Upper Paleolithic Hunting Behaviors in the Southern Caucasus

- Study of frequency and nature of hunting among Palaeolithic populations. Here new archaeological data from Ortvale Klde, a MP & early UP rockshelter in the Georgian Republic: comparison of N and MH hunting styles

- The analyses demonstrate that Neanderthals and modern humans practiced largely identical hunting tactics and that the two populations were equally and independently capable of acquiring and exploiting critical biogeographical information pertaining to resource availability and animal behavior.

D. Adler et al., 2014

While using different technologies, neither was superior.

- Both Ns and MHs had a deep understanding of the local environment and the permanent and seasonal distribution of key resources

- Both primarily hunted *Caucasian tur*, a mountain-dwelling goat-antelope; ambushed of herds during their seasonal movements through the Cherula Valley during fall & spring, during migration and breeding.

- The degree of planning depth and group coordination necessary to exploit this knowledge appears to have been largely equivalent between the two groups.

Different tools, same outcome

- While using different technologies, neither N or MH was superior. No significant difference in effectiveness of their classically different technologies.

- They were able to effect the same results in terms of hunting and resource procurement with markedly different technological repertoires

- It was the development and maintenance of larger social networks, by MHs rather than technological innovations or increased hunting prowess, that distinguish modern humans from Neanderthals in the southern Caucasus

Abric Romaní, a N rock shelter near Barcelona.

- Abric Romani: Many hearths and some imprints that preserve the shape of tools that were made from wood
- Marín et al.: studied the faunal remains from several layers at Abric Romaní, from 53 to 43 Ka.
- The largest fraction of the large herbivore bones: red deer and horses, with some rhinoceros, aurochs.

Abric Romaní: red deer strategy

- Neandertals used their understanding of landscapes and red deer behavior to put groups of hunters into situations where they could kill cornered animals.

- The red deer skeletal remains include most body parts, with no clear pattern of overrepresentation of any part. This suggests that kill sites may have been nearby Abric Romaní itself, making it easy for hunters to carry much of the carcass to the site for further butchering and eating.

Abric Romani

- The horses at Abric Romaní have a different age profile, mostly prime age adults with few juveniles or very old adult individuals.

- Neandertals may have had a strategy near Abric Romaní of hunting bachelor groups of horses, or they had situations that enabled them to hunt lone adult horses selectively.

- N hunters did not break down and carry whole carcasses to the rock shelter. For the most part, they brought home heads and did not transport other body parts as often. This pattern suggests that hunters were very selective in what they carried to the home site, focusing on the head with its rich fatty cheek meat and brain.

Neandertals hunted dangerous prey strategically

- With deep experience in the hunt, Neandertals could anticipate the behavior of many of the most dangerous prey animals.

- As we have seen, no current evidence that the Neandertals used arrows, atlatls, or other long distance-killing weapons.

5 hunting sites reveal N strategies

- Luckily, there are some sites where the bones of prey animals number in the thousands.
- A recent examination of five of these sites has drawn a picture of how these ancient people hunted.
- Neandertal knowledge of animal behavior and landscapes gave them a critical advantage.

Ns selected animals for their fat

- The archaeologist John Speth: Neandertals could not have been indiscriminate in their choice of age and condition of prey animals, for nutritional reasons.

- Predators like lions and wolves can subsist on diets with extremely high animal protein for a long time.

- But people cannot handle this without intake of substantial amounts of fat or carbohydrates. Neandertals had to be more selective in their prey choices than these other predators.

N choice of animal body parts

- Body parts were understood and valued differently.
- Instead of lean meat, the fattiest and most marrow-rich parts were prized to balance high protein intake and as a richer energy source.
- This means offal was certainly relished: brains are around 60 per cent fat, and grey matter is also full of particular lipids - long-chain polyunsaturated fatty acids - vital for health and fetal development

Ns selected animals seasonally

- Those choices were more critical in some seasons than others.
- Prey animals were fat-depleted during the winter, and adult males more fat-depleted after the mating season.
- Marín et al.: stone tools were specific to the task of processing leather from hides. Younger red deer would have had hides that were softer and easier to work than the hides of adults.

Using geographic hunting strategies

- N use of geography:
- Ns did herd drives: Ns used landscape features combined with knowledge of animal behavior in their hunting

- 50-odd horses were hunted at the Schöningen lakeshore, which were killed in multiple phases

- Neanderthals returned again and again, probably because driving small herds into the water was a great way to slow down otherwise fast, dangerous prey.

Ns knew herd behaviors

- N hunters used opportunities offered by seasonal migrations or breeding herds.
- Site like Mauran, near French Pyrenees: remains from several thousand hunted bison.
- The bison are mostly females and younger calves, suggesting that Neanderthals could have been targeting them during summer when they shifted from plains to uplands. Bison herds split into cows & calves, vs young males.

N ambush hunting strategies

- At other places, solitary-living species were also repeatedly targeted. Rhinoceros aren't sociable, and catching them needs careful stalking or ambushes at predictable locations.

- In interglacial forests, places with rock-licks or even mineral salt-rich water would have been good bets.

- Likely used this strategy at Taubach, in Germany, judging by striking amounts of butchered rhino carcasses,

- This pattern of selectivity extends into how they used their prey.

Bone Beds: "Shoot first, ask questions later"

- Mark White, et al., 2016:
  - comparison of 5 N "kill sites"
  - where they hunted and butchered animals in France, Germany, and Poland
- The five N sites represent different species of prey animals: bison, horse, rhinoceros, reindeer, and aurochs. The sites vary in geological age, from 120 to 50 Ka.

- At each site, Neanderthal hunting involved superb tactical planning, using the landscape to disadvantage prey.

Mark White, Paul Pettitt, Danielle Schreve, 2016

N hunting: use of topographic traps

- Ns were able to
  - organize game drives using landscape features as natural traps,
  - intercepting groups of animals at repeatedly used locations.

Shot first: use of topography in hunting

- Individually, each site shows Neandertals making effective use of geographic features of the landscape, such as
  - changes in topography,
  - narrow dead end side branches to valleys,
  - known marshes next to steep hillsides,
  - which enabled them to channel fleeing animals into situations where they were cornered, and then to kill indiscriminately.
- Hunting communally, killing animals at a topographical and seasonal advantage, and making use of the most valuable parts of carcasses were classic N strategies

Shoot first, ask questions later: use of topographic traps

- Their conclusions indicate that
  - Neanderthals did not necessarily pre-select individuals from a herd; they isolated, pursued and killed animal herds
  - Ns exploited their prey's known avoidance and flight behaviors
  - They ambushed whole groups, which they slaughtered indiscriminately in these topographic traps

Shoot first, ask questions later: use of topography

- Ns were highly selective in the carcasses they then chose to process.
- After the kill, only the 'prime' animals were chosen to butcher.
- White concludes: Ns were "excellent careful tacticians, casual executioners and discerning diners".
- These sites show Neandertals maximizing the chance of successful kills by using topography, while minimizing need for chase and tracking injured animals.

The bison bone beds: social hunting

- LP and MP faunal assemblages in Europe have produced convincing evidence of Neandertal communal hunting of large ungulates.

- Evidence for Neandertal prey selectivity at five sites.

- At Mauran, France, Neandertals repeatedly killed groups of bison, amounting to more than 130 animals over many years.

- Similar prior pattern of bison hunting in Gran Dolina, Atapuerca, Spain:

  ~ 400 Ka, hominins left the partial remains of more than 60 bison, forming a bone bed of more than 22,000 specimens.

Bone Beds: N hunting of single species

- Monospecies sites indicate that
  - Neanderthals were selectively hunting specific species and that
  - And were deliberately targeting and selectively taking specific individuals (i.e. prime adults) within the group

- Ns used selective hunting strategy, involving
  - tactical planning about the seasonal availability of certain taxa at specific points in the landscape,
  - regular 'on the spot' decision making about which specific individuals were to be targeted, presumably in order to maximize gain rather than to minimize risk.

Landscape site strategies

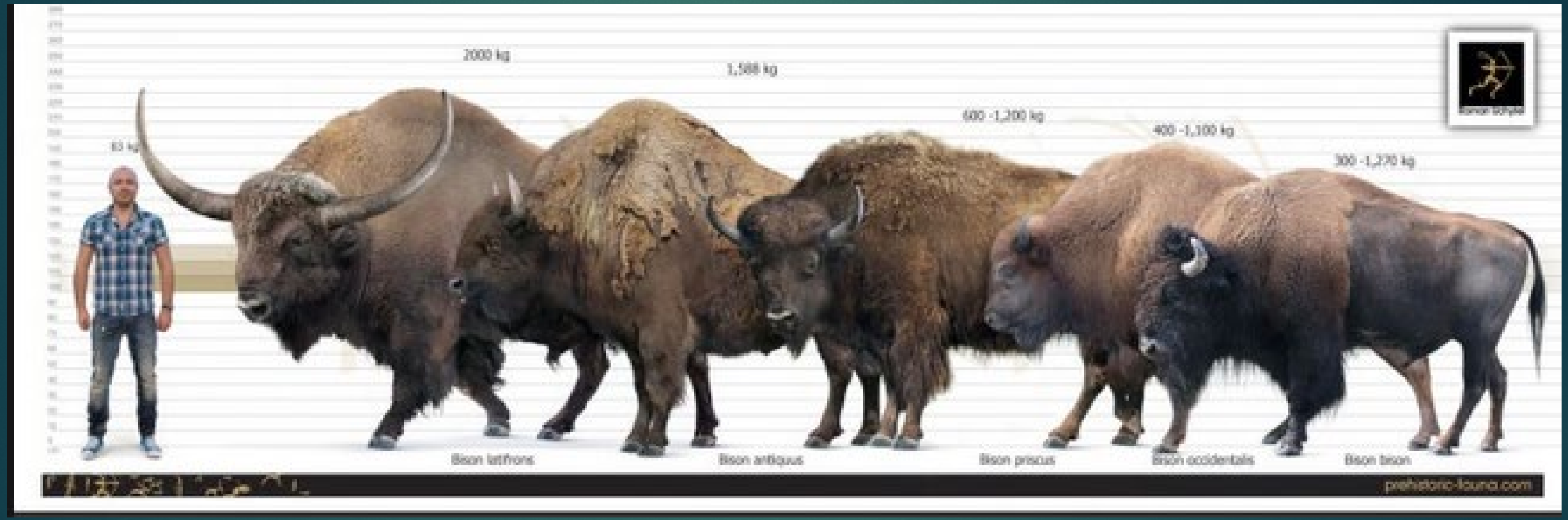
- At each of the other four sites, Neandertals used the landscape in their favor.
- They knew about and used changes in topography, narrow side branches to valleys, and marshes next to steep hillsides.
- Neandertals used these local features to corner groups of fleeing animals into places with no easy paths of escape—where the hunters then could kill indiscriminately.

Bison Beds: different sites and species

- A series of 5 kill sites from the Middle Palaeolithic of Europe
  - Mauran, La Borde, Taubach, Zwoleń and Salzgitter Lebenstedt.

- The five sites represent different species of prey animals:
  - bison, horse, rhinoceros, reindeer, and aurochs.

Bone Beds: Eurasian steppe bison (Bison priscus) at Mauran, France



1 - N Bone beds: Mauran – Bison hunting

- Mauran, France: Neandertals repeatedly killed groups of bison,
  - 137 animals over many years; estimated that >4000 bison were killed at the site,
  - multiple hunting events over a long period of time, perhaps a millennium with individuals and small groups taken each time.
- The topography—
  - kills took place at the end of a small gully bounded by limestone escarpments,
  - a rocky limestone barrier fronted by open vegetation and marshy ground — provided a natural trap into which Neanderthals could drive and corral bison

(Farizy et al., 1994).

N bison cow hunting

- Post killing ----
  - Limb bones are underrepresented in the existing faunal assemblage, meaning that limb bones were often carried away from the site. Much of the remaining carcasses were left for scavengers.
  - Suggested that several days of butchery and other processing may have followed kills.
  - Cows and young make up 80%, and adult males only 20%; in late summer and early autumn; unselectively slaughtered from among all animals within a typical cow herd

Mauran & Bison

- Neanderthals repeatedly used the natural topography of Mauran:
  - a cul-de-sac with open vegetation and marshy ground, to disadvantage the bison.
  - Exploiting their own flight behavior to engineer a stampede
  - Ns = a case of 'shoot first and ask questions later'.
- The use of locally available lithics = planned practice in a well-known landscape
- This locale illustrates the selectivity of the Neandertals in deciding which of their kills to process and which parts of carcasses to recover and transport off the kill site. Neandertals were in fact choosy in eating and taking away the most valuable parts.

2 - La Borde: Ns as original cowboys

- At La Borde, France: bones of 40+ aurochs. This site was a natural collapsed cave, called an *aven*, which made a depression at the base of a long sloping hill.

- 40%+ were juvenile aurochs;, with most adult individuals interpreted as cows and few or no bulls present

- Like many large herbivores, aurochs split for much of the year into herds with mostly cows and calves, some bachelor bulls, and some bull herds.

Aurochs


Lascaux cave paintings
♂
♀
Aurochs
Bos primigenius
Cattle
Bos taurus

N as cowboys

- Neandertals targeted cow/calf herds. They drove these herds into the aven where the animals could not easily escape.

- Neandertals had long experience with the behavior of these herds, knowing that a hunter that approached too close toward the front of the group at an angle would cause the animals just off the lead to react, narrowing the herd and driving the leader forward. Neanderthals understood and exploited the flight behavior of wild cattle….

- In short, Neanderthals were the original cowboys.

N Bone Beds: Aurochs: La Borde, France: a big hole

- Aurochs at La Borde: hunted nursery herds i.e. females and sexually immature individuals; Neanderthals selected animals based on their relative vulnerability and lower levels of aggression.

- Animals were butchered on-site using a tool kit of local quartz,

- Represented the wholesale slaughter of cow herds, perhaps numbering 10 to 20 individuals; steered them around the foot of the hill, into an existing hole where killing occurred

3 - Single Rhinoceros hunting: Taubach, Germany

- The Taubach, Germany, site preserves evidence of multiple single-animal kills of rhinoceros over time circa 120 Ka
  - Neandertals were targeting young rhinoceros individuals with a strategy that separated them from other adults.
- The site of Taubach, Germany, illustrates a different hunting situation. Here, rhinoceros came to wallow and drink at warm springs. Neandertals lay in wait under cover of natural brush, where they could watch rhino mothers and calves. Only when a calf wandered far enough from its mother did the hunters strike. This series of events explains why 40 out of a minimum 76 rhinoceros individuals were juveniles between 1 and 1.5 years of age.

Wooly Rhinoceros

4 - Zwolen, Poland & 5 - Salzgitter Lebenstedt, Germany

- 4 - Horse hunting: Zwolen, Poland:
- Horse trap: Deep ravine valley narrowed to only tens of meters wide, with steep sides some 6 m high; a bottleneck trap near a river

- 5 - Reindeer hunting: Salzgitter Lebenstedt, Germany:
- 58 to 54 ka: autumn reindeer hunting by Neanderthals. Driving animals along the main valley, and diverting them into the mouth of the tributary Neanderthals then slaughtered them.

- (The average Inuit required 25 reindeer skins each year)

N hunting tactics across Europe

- The repeated occurrence of monospecific faunas across Europe shows that these were not regionally restricted behaviors but part of a widespread phenomenon involving 'the interception of entire herds at waterholes, water streams, or along their migratory route'

- Ns even seasonally 'harvested' mature hibernating bears

- These 5 sites represent planned encounters; the presence of prey herds was predictable, either year-round (aurochs at La Borde, rhino at Taubach, perhaps horse at Zwolen) or for brief periods during seasonal cycles (such as the end of the autumn rut for bison at Mauran or migration of reindeer at Salzgitter Lebenstedt), and that is why Neanderthals were present at these places.

Ns as ethologists

- Neanderthals were also accomplished ethologists (animal behavior specialists), aware of the behavioral foibles of different taxa and able to choose their hunting strategies accordingly.

- Recurrent use of driving and trapping of herds, driving and ambushing of herds, and stalking and ambushing of individual animals, all using of the natural topography and the animals' own social and avoidance behavior to their advantage.

N had coordinated planning during hunting

- Where they lacked speed, Neandertals surpassed other hunters in coordinated planning. Several individuals had to commit to a shared strategy and carry out their parts, often out of sight or hearing of each other.

- They relied upon knowledge of prey animals' social behavior to move them into prepared killing zones.

- Some of the Neandertal hunting strategies would work with only one individual driving a group of animals, but the La Borde situation is an example where moving prey into the right position would have taken at least two or three hunters.

European bone beds

- In total, these show that effective communal hunting of large mammals was part of the behavior of Ns in Europe well before the appearance of Middle Paleolithic toolkits.

- This is fully consistent with other well-documented and thoroughly taphonomically investigated assemblages from the Middle Pleistocene, such as Bolomor, Cuesta de la Bajada, and Gran Dolina TD10.1 and Gran Dolina TD6 in Spain, Schöningen in Germany and Gesher Benot Ya'aqov and Qesem in the Near East

Social benefits

- The meat from several bison is far more than a single group of people can eat at a time.

- Neandertals may have dried meat or practiced other methods of storage, but in one important way, the long-term payoff of a big kill is more valuable than the meat, furs, or other materials that it yields.

- A big kill is a social event. The long-term value of a big kill is in the social relationships that it builds.

Shoot first, ask questions later

Summary of organisation of hunting at the five sites considered.

Taxon	Site, age	Hunting tactics: Locating the prey	Hunting tactics: Disadvantaging the prey	Hunting tactics: Exploitation of prey behaviour	Hunting tactics: Killing techniques	Hunting strategy	Butchery practises
Bison	Mauran, MIS5a	Predictable autumn rutting and feeding grounds	Use of topography as natural trap	Exploits flight behaviour	Unselective killing of mixed herd	Driving and trapping	Selection of choicest fat, fillets and rump
Aurochs	La Borde, MIS5	Animals probably present in region all year-round	Use of topography as natural trap	Exploits flight behaviour	Unselective killing of mixed herd	Driving and trapping	Little evidence of selection
Rhino	Taubach, MIS5e	Animals predictably attracted to springs as water sources and salt licks	Use of topography for concealment and observation	Exploits inexperienced calves separated from mothers	Selective killing of calves when opportunity presents itself	Stalking and ambush	Butchery of selected individuals
Horse	Zwoleń, MIS5a or 4	Animal movements predicted by the distribution of their resources	Use of topography (bottleneck) as means of disadvantaging and ambushing	Exploitation of flight behaviour	Unselective killing of mixed herd	Driving and ambush	Selection of choicest meat
Reindeer	Salzgitter-Lebenstedt, MIS3	Predictable (i.e. known) autumn migration route	Use of topography (valley) to channel prey	Exploits avoidance behaviour, possible use of noise to 'attract' reindeer	Unselective killing of mixed herd	Driving and ambush	Selection of largest & fattest individuals

Another Earlier Bone Bed: Gran Dolina, 450 Ka, *H. antecessor?*

- Gran Dolina, Spain: pattern of bison hunting at 450 Ka; 60 bison, forming a bone bed of more than 22,000 specimens.
  - Killed at two different times of year (first-year juveniles of at least two different seasons).
  - The hunters carried whole bison bodies into Gran Dolina. There they butchered the animals further and then carried most of the long bones somewhere else. What they left behind was mostly skulls, vertebrae, and ribs—many more ribs than most other faunal assemblages.
  - The hominins broke the ribs and "snack" on red bone marrow. Removed and ate many of the tongues.

Very early Gran Dolina hunters

- These show that effective communal hunting of large mammals was part of the behavior of hominins in Europe well before the appearance of Middle Paleolithic toolkits.

- In the Gran Dolina cave site, ancient people left a bone bed of bison killed in two seasons and butchered at the site with expedient tools.

- Suggests that the cognitive, social, and technological capabilities required for successful communal hunting were at least fully developed among the pre-Neanderthal paleodeme of Atapuerca during the Lower Paleolithic.

La Co

Significance of barbecues

- Example: Cliffs at La Cotte de St. Brelade, Jersey: barbecued piles of mammoth and wooly rhino bones
- Greatest long term occupation site of N in Europe; N kept returning to La Cotte for 140 thousand years from 180 Ka to 40 Ka
- Longest barbecue site in history
- Neandertal cognitive ability at Jersey? Controversy over herding over cliff

N as apex predators, but also plant eaters

- Comparing nitrogen δ15N levels in Neandertal bones from Belgium, France, and Croatia with those of various animals with differing diets from the same regions, showed Neandertals clustering with species that get their protein almost exclusively from meat.

- More recent studies indicate that dietary diversity among Neandertal individuals was less than that among other carnivores and that Neandertals got about 80% of their dietary protein from eating animals.

- Neandertals were not exclusively carnivorous. Direct evidence of food-plant remains (seeds, fruits, tubers) has been recovered from the Neandertal site of Kebara. Residues of starchy plants have been detected on Mousterian tools.

1911 – Lehringen, Germany, 100 Ka: 8 foot thick spear

N spear use

- Today wood, bone and shell are central to new perspectives on Neanderthals as technical artisans in substances other than stone.

- 1911 – Lehringen, Germany, 100 Ka: 8 foot thick spear; under an elephant

- Schöningen, Germany: Alongside dozens of butchered horses - elegant, finely tapered wooden spears.

Schöningen spears

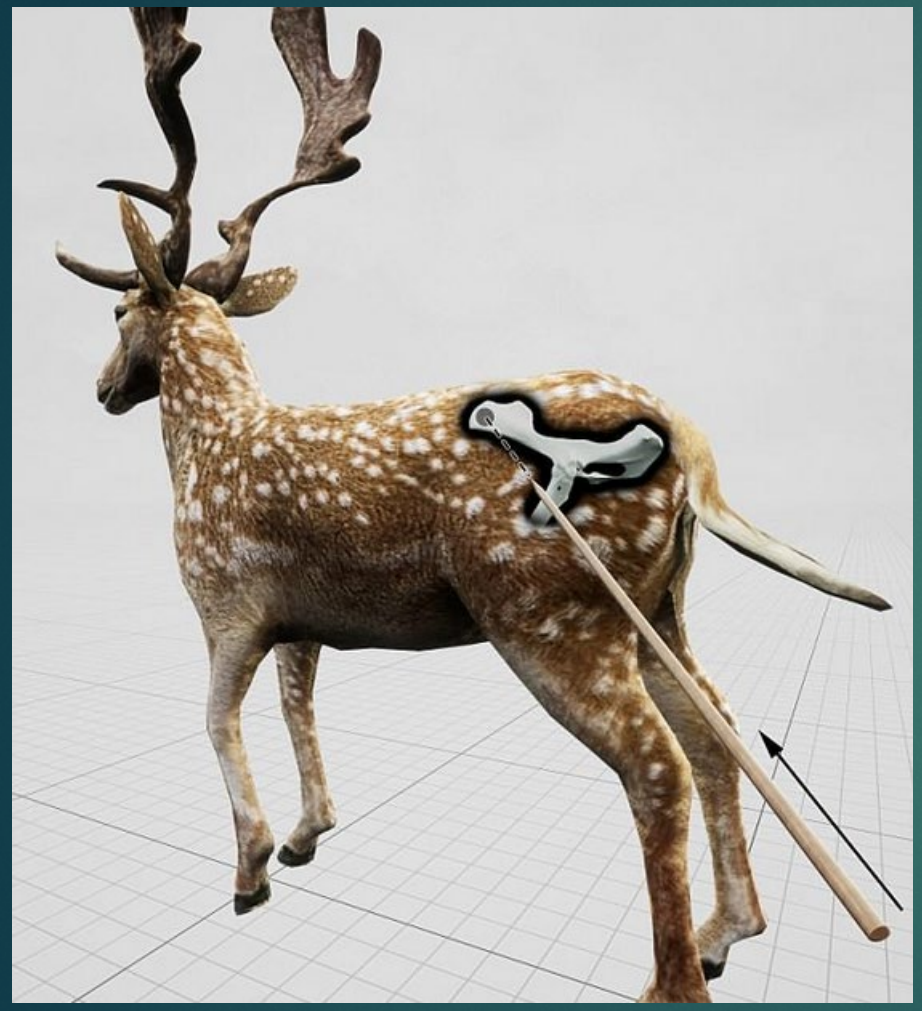
- Dating between 337 and 300 Ka, the Spear Horizon at Schöningen is a vaguely diagonal spread covering about 50m^2 along the shore of an ancient lake. Just one layer among many at Schöningen, it alone contains over 15,000 finds.

- Mostly bone, there are however numerous pieces of wood including in a relatively small area, eight fragmented spears. The most complete was only snapped in two places and was nestled among remains of one of the 50 horses butchered there.

Deer at Neumark-Nord were hunted with close-range spears

- Two large extinct fallow deer skeletons were found around the shores of a small lake Neumark-Nord, Germany
- Neumark-Nord, Germany, provides the first direct indication as to how these hunts were undertaken, as it demonstrates close-range hunting.
- Close-range hunting is risky, needs cover, a group of hunters and very close cooperation between the members of the group.

Newmark-Nord fallow deer hunting, 120 Ka



Deer pelvic holes from spears: Coming from an underhand angle, it required careful planning and concealment.

N wood technology

- Schöningen: These spears blew apart notions of primitive Neanderthal woodworking abilities: Ns knew their wood species and their properties; they're far from pointed sticks. Finely crafted from thin spruce and a single Scots pine.

- Ns knew how to use the stump end for the tip of the spear because that's the hardest part of the wood.

- More than that, the shafts were systematically carved off-center for increased strength, a trick also seen some 200,000 years later at Lehringen.

Schöningen, Germany – lignite mining site; spears at 337 Ka

Oldest Wooden Spears: Schöningen, Germany; 337-300 Ka

Wooden thrusting spear, Schöningen, Germany, about 400,000 years old.

- 8 wooden spears like this one were found at Schöningen, Germany, along with stone tools
- These spears are currently the oldest known wooden artifacts in the world.
- Along with some still embedded in horses.
- Schöningen spears had ballistic qualities indicating that they were thrown as javelins
- Created by using stone tools to sharpen both ends of 2-meter-long spruce shafts that had been scraped smooth.

Date of discovery: 1995
Discovered by: Hartmut Thieme
Site: Schöningen, Germany

Image Credit: Chip Clark, Smithsonian Institution

Significance of Schöningen spears

- The spears and their correlated finds are evidence of complex technological skills and are the first direct evidence that these humans hunted their prey.
- The large and swift prey that the Schöningen humans butchered suggests that their technologies and hunting strategies were sophisticated, that they had complex social structures, and had developed some form of communication.
- The Schöningen humans had cognitive skills such as anticipatory planning, thinking, and acting in coordinated strategies.

Wooden tools

- But weapons aren't the only wooden objects now known to have been made by Neanderthals.

- New finds in 2018 from Southern Europe confirmed the scope of their skill. Multiple worked sticks with single pointed ends came from two open-air locales: Aranbaltza in northern Spain dating around 90 ka, and Poggetti Vecchi in Italy aged about 200 ka.

- Much shorter than the Schöningen spears, their length, damage patterns and use-wear strongly suggest that they were digging tools, though probably also useful for prodding, poking and aiding walking.

2020: Throwing sticks at Schöningen, Germany: 300 Ka

In situ

And duck bones

Early humans were weapon woodwork experts.

Master woodworkers

- State-of-the-art analysis of a double-pointed wooden throwing stick, found in Schöningen in Germany three decades ago, shows it was scraped, seasoned and sanded before being used to kill animals. The research indicates early humans' woodworking techniques were more developed and sophisticated than previously understood.
- The creation of lightweight weapons may have enabled group hunts of medium and small animals. The use of throwing sticks as hunting aids could have involved the entire community, including children.
- These early humans demonstrated an ability to plan well in advance, a strong knowledge of the properties of wood, and many sophisticated woodworking skills that we still use today.

Woodworking

- The Schöningen humans used a spruce branch to make this aerodynamic and ergonomic tool.
- The woodworking involved multiple steps including cutting and stripping off the bark, carving it into an aerodynamic shape, scraping away more of the surface, seasoning the wood to avoid cracking and warping, and sanding it for easier handling
- Found in 1994, the 77cm-long stick is one of several different tools discovered in Schöningen, which includes throwing spears, thrusting spears and a second similarly sized throwing stick.
- The double-pointed throwing stick was most likely used by early humans to hunt medium-sized game like red and roe deer, and possibly fast-small prey including hare and birds that were otherwise difficult to catch.

Throwing sticks: like a boomerang

- The throwing sticks would have been thrown rotationally—similar to a boomerang—rather than overhead like a modern-day javelin and may have enabled early humans to throw as far as 30 meters. Although lightweight, the high velocities at which such weapons can be launched could have resulted in deadly high-energy impacts.

- The fine surface, carefully shaped points and polish from handling suggest this was a piece of personal kit with repeated use, rather than a quickly made tool that was carelessly discarded.

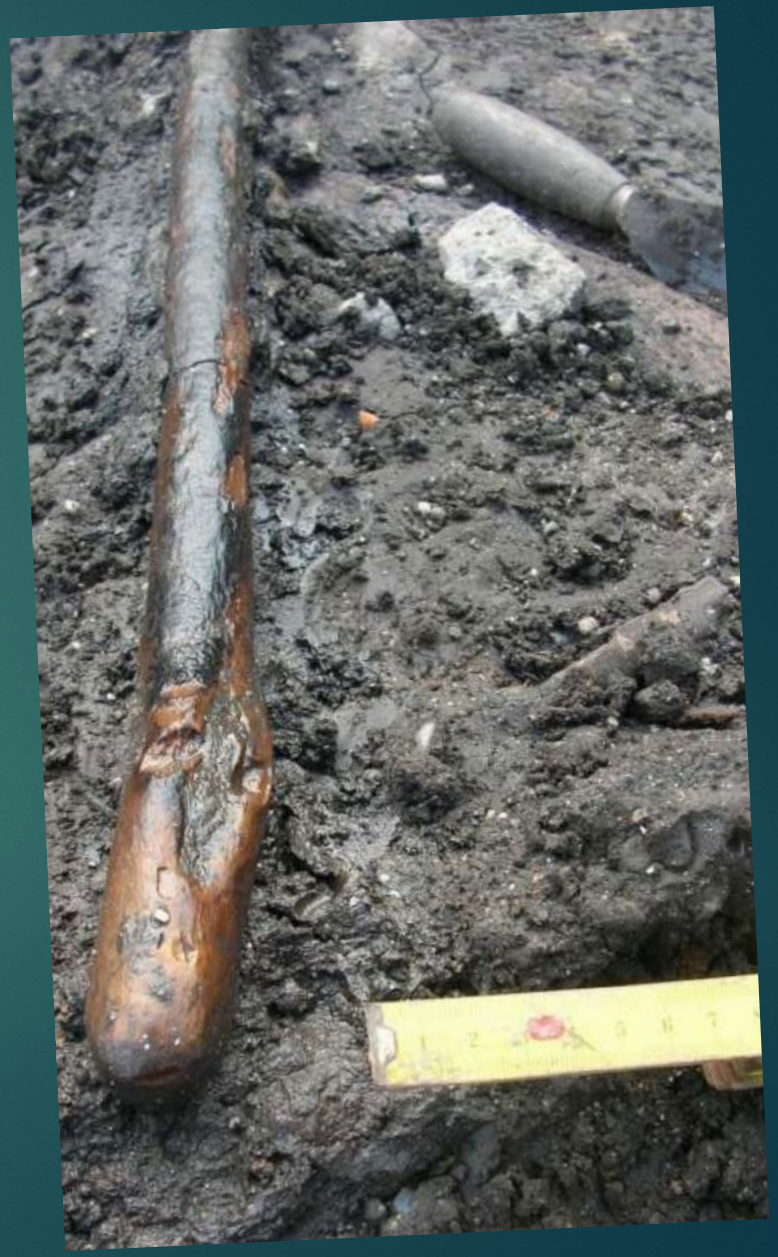
- Hominins were technologically capable of capturing smaller fast prey and avian fauna

Artistic reconstruction showing the stick would have been thrown. Credit: Benoit Clarys

Digging sticks, 171 Ka, at Poggetti Vecchi, Grosseto, Italy.

- Oldest known multipurpose tool forged in fire;
- Earliest use of fire for toolmaking among Neandertals.
- 39 three-foot-long sticks made of boxwood that had been rounded at one end and sharpened at the other;
- Identical to digging sticks used by hunter-gatherers to gather tubers

Aranguren et al. 2018



N knowledge of material

- Ns knew their raw material.

- One of the two Aranbaltza sticks was yew, an extremely hard-wearing yet flexible wood; Yew was also the choice of both the Clacton-on-Sea and Lehringen spear makers.

- Meanwhile at Poggetti Vecchi, all 40 worked fragments of wood - representing at least 6 tools based on the numbers of handles - were of boxwood: even tougher and denser than yew: among many traditional societies the hardest available species are selected for digging sticks precisely because they're durable.

N and elephants

- Elephants (mammoth) and rhinoceros are not common in Neandertal food remnants.

- Klein (2009) originally argued that Neandertals' hunting skills were generally not up to dealing with these really big animals, which were not systematically hunted until modern humans came along.

- However, the Krapina Neandertals regularly exploited large bovids and rhinoceros, and large accumulations of mammoth bones are found at several Mousterian sites in the Ukraine (Klein 1973b, Hoffecker 2002). Klein suggests that Mousterian people might have been collecting these mammoth bones for use in building structures, rather than hunting the living animals.
- But he was wrong.

Ns hunted straight-tusked elephant (Palaeoloxodon *antiquus*): The largest European land mammal

Neanderthals hunted elephants at Neumark-Nord 1 (Germany), at 125 Ka, a finding that has major implications for our understanding of social and cultural aspects of Neanderthal behavior

S. Gaudzinski-Windheuser, et al., 2023

Standing beside a life-size reconstruction of an adult male straight-tusked elephant = 28,000 lbs
12 ft tall

Implications of German N elephant site

- Site implies enough food to maintain much larger group of Ns; implications of food perseverations
- Compelling evidence of Neanderthals hunting megafauna, specifically straight-tusked elephants
- Reinforces concept of strategic hunting ability

Implications of Newmark-Nord

- Elephants were systematically dismembered and processed: a specific pattern of repetitive cut marks on the surface bones that were found in the same place on different animals and on the left and right skeleton portions of a single animal

- Given that a single mature male animal weighed 28 K lbs, slaughtering probably required a sizable crew and took many days.

Implications of hunting 28 K lbs straight tusk elephants

- Estimates of these elephants as a food source: a 10- ton elephant would have taken 200 to 600 person-hours to process, which with a hunter-gatherer group size of 25 people would mean 3 to 5 days.

- The yield is mindboggling: more than 2500 daily portions of 4000 calories per portion. A group of 25 foragers could thus eat a straight-tusked elephant for 3 months, 100 foragers could eat for a month, and 350 people could eat for a week.

- It is worth noting that Neanderthals are typically thought to have lived in groups smaller than 25 people.

Newmark-Nord: a multi year barbecue?

- Estimate that an elephant was killed roughly every 5 to 6 years at the site.

- The ramifications of having access to such a large quantity of meat on a semiregular basis goes far beyond what we know about Neanderthal behavior,
- Only two plausible explanations for how they dealt with such an influx of resources.
  - First: Neanderthals had the cultural knowledge and mechanisms to store meat—drying, freezing, or caching—and
  - They spent much more time in a single location than we typically envision (i.e., months as opposed to days).

Implications of Newmark-Nord

- Second: In some situations, Neanderthals lived in much larger groups or participated in temporary groupings, which would have provided important opportunities for social, cultural, and genetic exchange.

- This is solid evidence for Neanderthals hunting megafauna as a fairly regular part of their subsistence repertoire.

- All evidence points to Neanderthals being excellent hunters that periodically displayed broader diets than previously known.

Food preservation

- Need to consider that Ns:
  - had food preservation techniques to store food and
  - were occasionally semisedentary or that
  - they sometimes operated in groups larger than we ever imagined.

- It is increasingly clear that Neanderthals were not a monolith and, unsurprisingly, had a full arsenal of adaptive behaviors that allowed them to succeed in the diverse ecosystems of Eurasia for over 200,000 years.

Neanderthals may have cleared a European forest with fire or tools

- When Neanderthals were at Neumark-Nord in Germany, the region had far fewer trees than surrounding areas, suggesting they may have cleared the forest on purpose
- Neanderthals may have reshaped part of the European landscape 125,000 years ago, clearing trees to create a more open environment in which to live.
- It is the oldest evidence of a hominin having landscape-level effects.

Clearing landscape

- MacDonald et al.: Compared with neighboring sites where Neanderthals didn't live, the team found a decrease in the tree cover.
- While neighboring areas were densely forested, Neumark-Nord "would have been a lot more light and open, and probably more varied as well.
- Alternative: It could also be that a natural wildfire opened up the vegetation and Neanderthals arrived in the aftermath.

Cave Bears: N's favorite carnivore target

- Most Mousterian sites contain no remains of large carnivores, but bones of the extinct cave bear (Ursus spelaeus) are plentiful at Krapina, Vindija, and some other Mousterian sites in Europe

- Evidence that Neandertals were hunting cave bear; and cut marks on cave bear bones from Mousterian sites in Germany do suggest that when Neandertals and bears met, Neandertals often had the upper hand.

- However, they may not have met often or on purpose. Cave bear bones are usually found in cave strata where evidence of human presence is minimal or lacking.

Ns and Cave bears

- Most of the bear remains found in Pleistocene caves are the result of natural deaths during hibernation.
- At Krapina, are due to normal bear deaths in the cave.
- It is understandable that humans would have avoided these large, deadly animals when at all possible – and vice versa.

Systematic bear hunting at Biache-Saint-Vaast at 200 Ka

- Across multiple levels of river deposits, many thousands of bones show that Neanderthals hunted and thoroughly butchered at least 107 Deninger's and brown bears.

- Since bears will den in slopes with reasonably soft ground, hunting during hibernation may have been possible even without caves. But most are adult males.

- Hunting bears is more dangerous than other more abundant prey like horses or giant deer. These species were present at Biache-Saint-Vaast, France, but Neanderthals aren't as interested in them, preferring aurochs and bear.

- Heavy bear fur may well have been a motivation, and cut marks do support this. But bear hunting is least common during the colder phases here.

Ns and bears

- In the absence of clear economics a socially motivated explanation for the Biache-Saint-Vaast bears was proposed, but it was very Western: Neanderthals were intentionally selecting dangerous prey to gain prestige.

- Another weird thing about Biache-Saint-Vaast: high numbers of butchered skulls.

- Bears weren't arriving at the cave as entire carcasses, but if furs and fat were the main interest, why carry extremely heavy heads?

- Eyes, tongue and brain could easily have been removed elsewhere. There's endless evidence that Neanderthals selected what they carried based on quality.

Bear skulls

- Bear heads are more common than expected, especially for big animals.
- Hunting trophies? Like at Cueva Des-Cubierta, Spain.
- This brings us back to Biache-Saint-Vaast, where despite bears being the second most frequent species overall, hardly any of the hundreds of retouchers came from their bodies.

Predators, esp. bears

- Plenty of Neanderthal sites exist with the odd cut-marked carnivore bone such as wolf, fox or dhole (an Asiatic wild dog).

- Even butchery of bigger, more dangerous predators like a lion at Gran Dolina between 350 and 250 ka, hyena around 120 ka at Maltravieso or a leopard at Torrejones Cave after 100 ka, all in Spain - probably represent chance encounters useful for food and furs.

- But with bears, it looks like something else was going on. Neanderthals hunted them more than any other predators, encountering three sorts: Eurasian brown bear and Deninger's bear.

- Even the brown bears tended to be bigger than those today, but cave bears were huge about 1,320 lb - and when standing would have towered over Neanderthals. They also, as implied by the name, preferred using subterranean dens rather than digging holes

Hibernating Bears

- Wherever bears slumbered, hibernation offered a relatively safe hunting opportunity, a fact known to lions and leopards as their bones are sometimes found far underground alongside bear remains.

- But Neanderthals too were stealthy hunters in the dark.

- Among the more than 20 bear butchery sites in Europe are caves in the foothills of the Italian Alps including Rio Secco. Two layers there dating around 48 to 43 ka reveal that Neanderthals slaughtered at least 30 winter-dreaming bears.

Hibernating bears

- As they processed entire carcasses, they focused especially on the fatty chest and limbs as well as marrow and tongues.
- The bear's own ribs were used to resharpen the slicing tools, and burning hints at cooking right there in the den.
- Other sites show that Neanderthals knew bears' habits well enough to track them even to high-altitude dens like Generosa Cave, also in the Alpine foothills; at around 5,000 ft it probably required waiting until spring to ambush groggy and weak emerging bears.

N bear hunting

- Fumane Cave, westwards along the Alps: the consumers at the other end of bear hunts were Ns at their home sites.
- The latest layers between 43.6 and 43.2 ka reveal Neanderthals bringing back choice cuts from bears hunted elsewhere.
- Systematic hunting was also happening at Taubach, where Neanderthals not only ambushed rhino but at least 50 bears.
- Carnivores and bears can be just as partial to mineral licks as herbivores, and networks of game trails but also reliable locales for ambushing bear.

Lessons from bear hunting

- The lessons from Neanderthal carnivore and bear hunting are several.
- At least some of it - especially the bears - wasn't scavenging but targeted, even specialized killing.
- This speaks to serious courage on the part of the hunters, plus collaboration and probably planning.
- Den hunting was clearly happening, but we should be open-minded about other options like traps, whether deadfalls or pits.

N food choices

- Brains as well as other juicy parts like eyeballs, tongues and viscera were favored by Neanderthals.

- Schöningen shows how this worked: one horse contains far in excess of 200,000 kcal, but they're very lean.

- So Neanderthals skillfully skinned and took them apart, slicing off flesh from the meaty haunches and withers, rather than taking them away. They paid more attention to getting marrow from the lower limbs as well as tongues and internal organs.

Food choices

- But this practice was tailored by species: smaller game saw more intensive carcass processing.

- At places like Fumane, where mostly marrow-rich joints from carcasses hunted elsewhere were brought back, almost every limb bone was methodically reduced to shattered shaft fragments in order to get marrow.

Neandertals
as Stone Artisans

Ns were master stone artisans

- The enduring myth that Neanderthal lithic technology was stuck in some kind of cognitive mire, bogged down by minds unable to innovate, is false.

- Neanderthals were hunter-gatherers at the top of their game.

- From 150 Ka onwards there is a strong impression that they evolved ever-more creative solutions as their geographical range expanded.

Re-excavations of old N sites

- Sites excavated before the 1950s threw away massive amounts of small lithics that contained a large amount of information. Many sites are now reexcavating the old excavations.

- Now using twenty-first-century methods: Over several weeks the excavated depth might increase by less than a hand's span, because everything is kept. Pieces over 2 cm have their precise 3D coordinates plotted using lasers, while anything smaller is located to within a 50 cm grid square. Truly minuscule splinters are recovered through wet sieving.

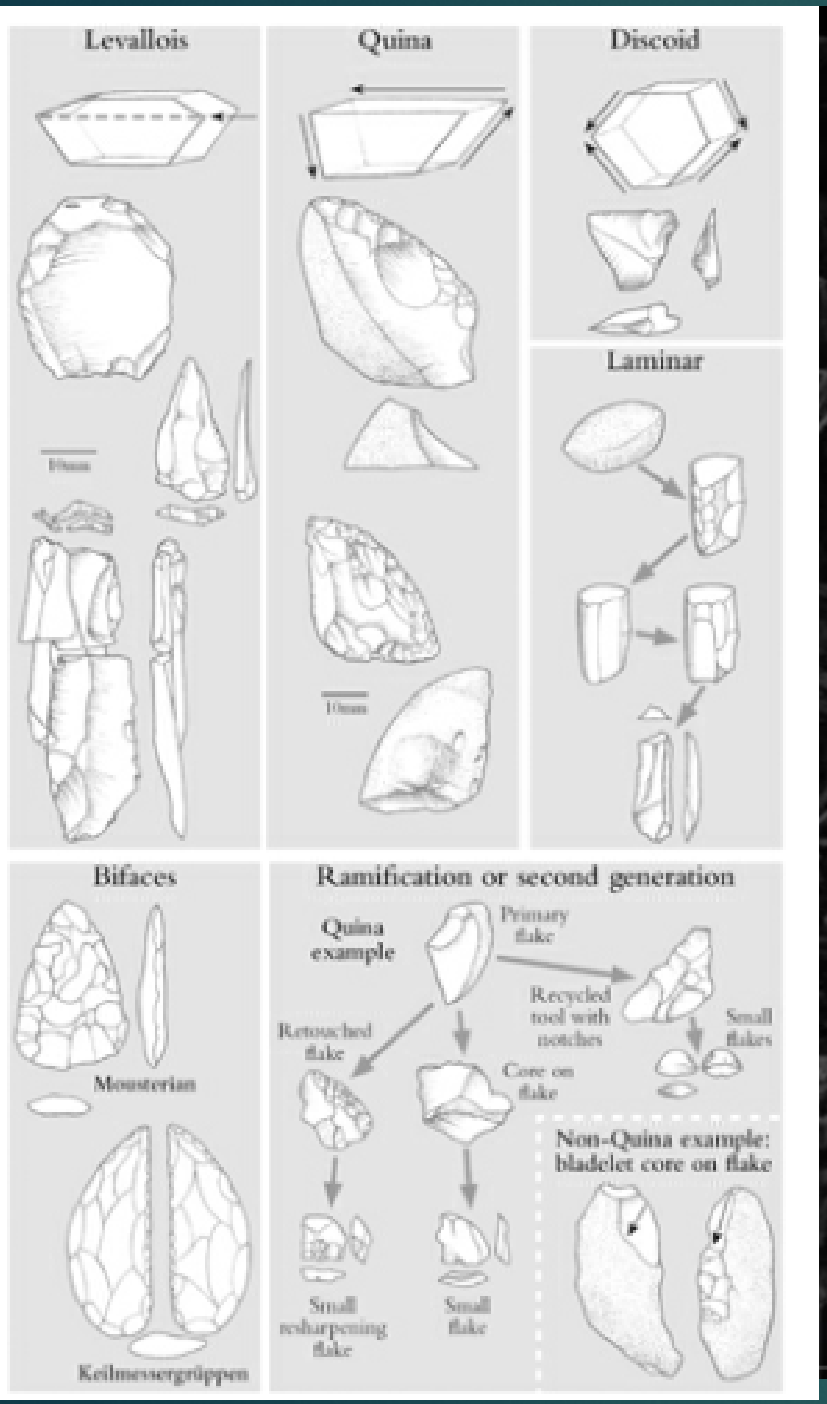
- This modern 'total collection' policy, combined with meticulous examination of lithic details, has led to a new appreciation for the complex interplay between Neanderthals and stone.

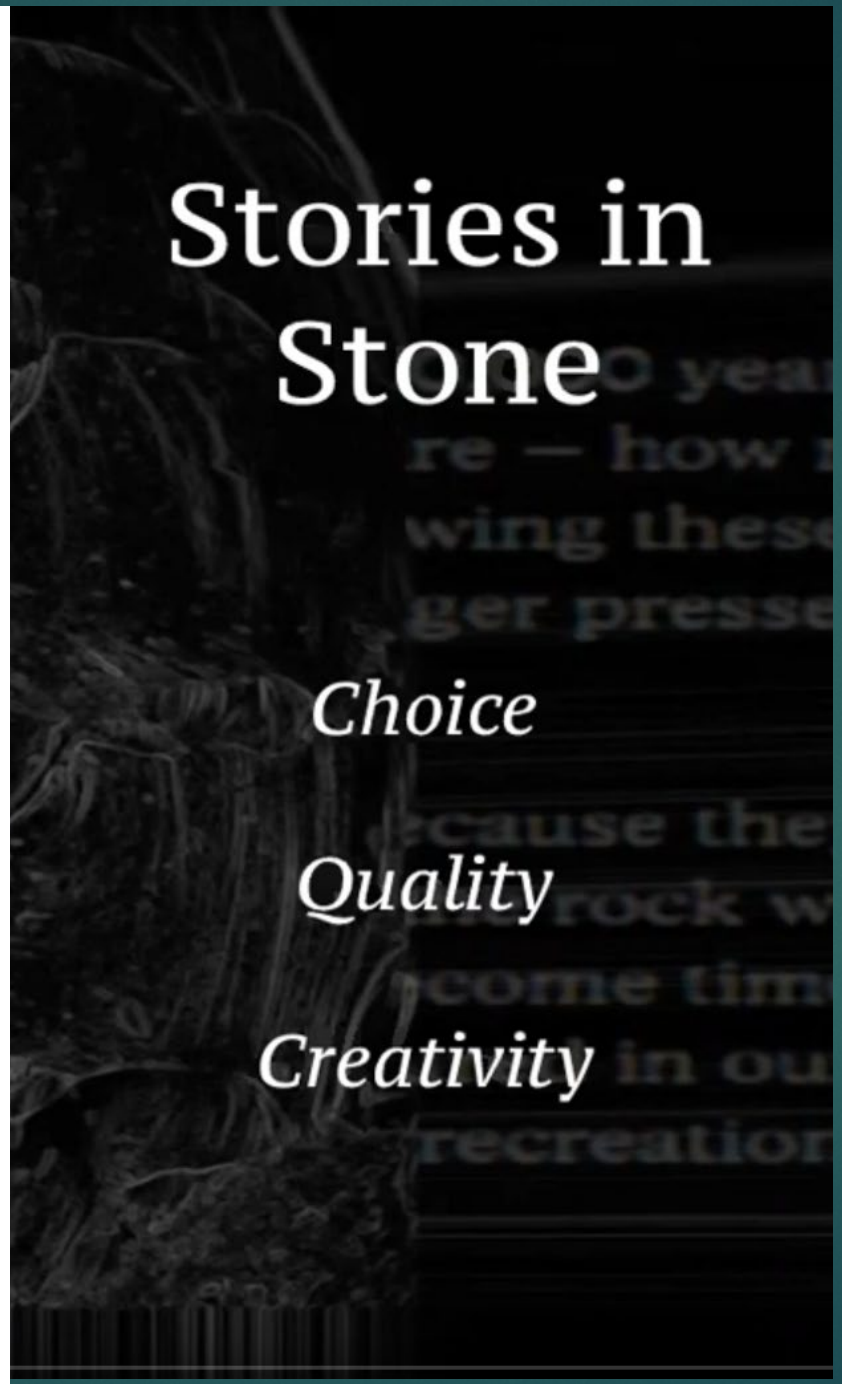
N geological knowledge: used only best stone

- Ns preferentially choose high-quality stone when they expected tools to require resharpening due to long-term use, but for the same reason it's the largest flakes that tend to be retouched.

- And when Neanderthals transported objects between sites, they moved those made from the best rock farthest, never bothering to carry poor-quality stone to richer areas.

- This implies not only constant decision making, but an extraordinary knowledge of the geology across wide regions.





Myth of Ns lacking innovation in stone tool making

They knew their stone material:

They were picky about which material to use, focusing on the quality of their material

Analysis via refitting = recreate their process of knapping the stone

Stone tools = lithics = “artifacts”

- 99% of all Middle Paleolithic artifacts are stone.
- Stone tools were the center of N life. They are a rich resource of insight into N life.
- Lithics from Le Moustier are a 'type site' and gave the first name to a Neanderthal Middle Palaeolithic culture: the Mousterian.
- Yet the first Neanderthal fossils to be found seemed to have no accompanying artefacts (lithics at Feldhofer went unnoticed, only rediscovered in quarrying waste in the 1990s).

Did Ns have a stone culture?

- For some 30 years the makers of the Mousterian lithics were a mystery, and equally nobody knew if Neanderthals had material culture.

- The first observed association between N skeletons and Middle Paleolithic artefacts was at Spy, Belgium,

- It took far longer for prehistorians to comprehend that Neanderthals manipulated stone in remarkably sophisticated ways.

Stone Gourmands

- Think of Ns as artisans who were deliberate and picky about materials they used

- Just as Ns were picky about type of animal parts they would carry to home site, they traveled with only the best tools

- Rock sourcing:

  Over 100s of kms;

  Long distance trading based on rock source identification including trading shells from fossil deposits

Ns were stone artisans who knew their rock sources

- 5 different stone technologies: Acheulian, Mousterian, Lavallois, Discoid, Quina traditions
- Tool production efficiency; knew exactly what they wanted; not wasteful; klg of multiple rock sources – knew their geological rock sources
- Clear, expert engagement with materials
- Understood material properties of specific rock types
- Ns were picky in their choice of quality of the stone materials they picked
- Did not carry rubbish stones on their travels, only good stone material they could resharpen

Knapping stone tools

- By looking for knapping features on cores and flakes, researchers can reconstruct the method of knapping and to some extent its sequence, sometimes with a single refitted stone artefact.

- Ns were stone artisans; they appreciated the right tools for the job.

- Selecting the hammers - the things that struck the cores - was crucial. Small cobbles have the necessary mass to hit hard for big flakes, but for more delicate work pebbles are better. And using 'soft' rather than hard hammers produces different effects. Elastic organic materials like antler and bone spread the kinetic energy & produce thinner, longer flakes.

Knapping

- This was crucial when shaping was the goal, and for secondary knapping (retouching).

- Lithic artefacts that were used to do other things - were often retouched, sometimes to give a particular edge, but often to resharpen them: flakes dull very fast even when cutting meat.

Neandertals used bifaces at beginning and end of their existence; in certain locales, and not in others

Bifaces

- By 1.8 Ma the ability to mentally divide volumes is shown in the most visually iconic of all Paleolithic stone artefacts: Acheulean bifaces.

- Neanderthals inherited these already ancient ways of working stone and also made bifaces.

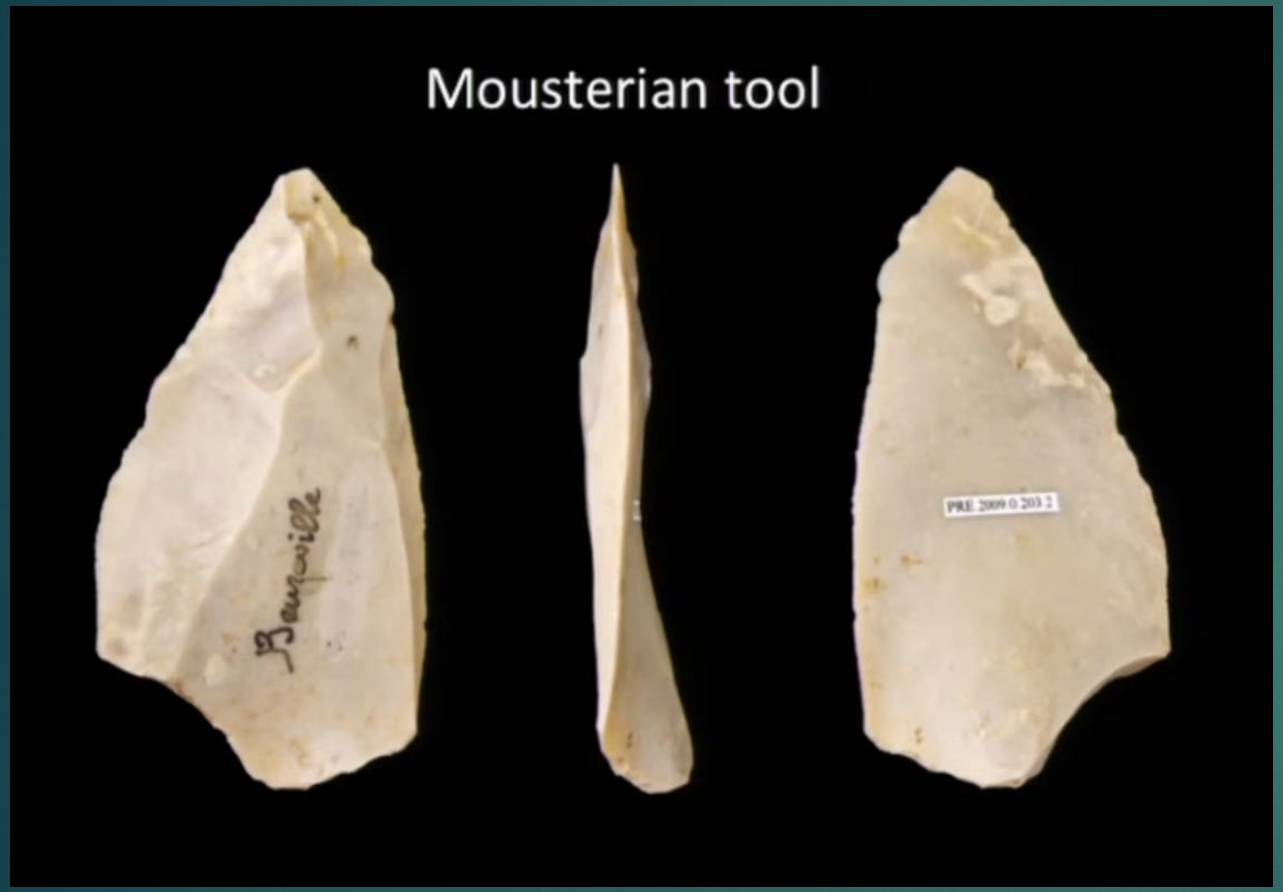
Pontnewydd Cave, Denbighshire

Early Middle Paleolithic, 300 Ka

Britain: used local volcanic stone,

Britain, 60 Ka: Biface handaxes and Discoids; less often Lavallois

Lavallois



Ns also used other materials

- In Greece & Italy, experiment with shell tools
- Properties of different bones: leather skin working lissoirs (choose only larger bison ribs, not deer bone)
- Use of wood – Schöningen javelins - tips made of base of tree trunks (most dense part), wooden tools for domestic use
- Use of plants: cordage (of conifer bark/root)

N adhesives, sunscreen

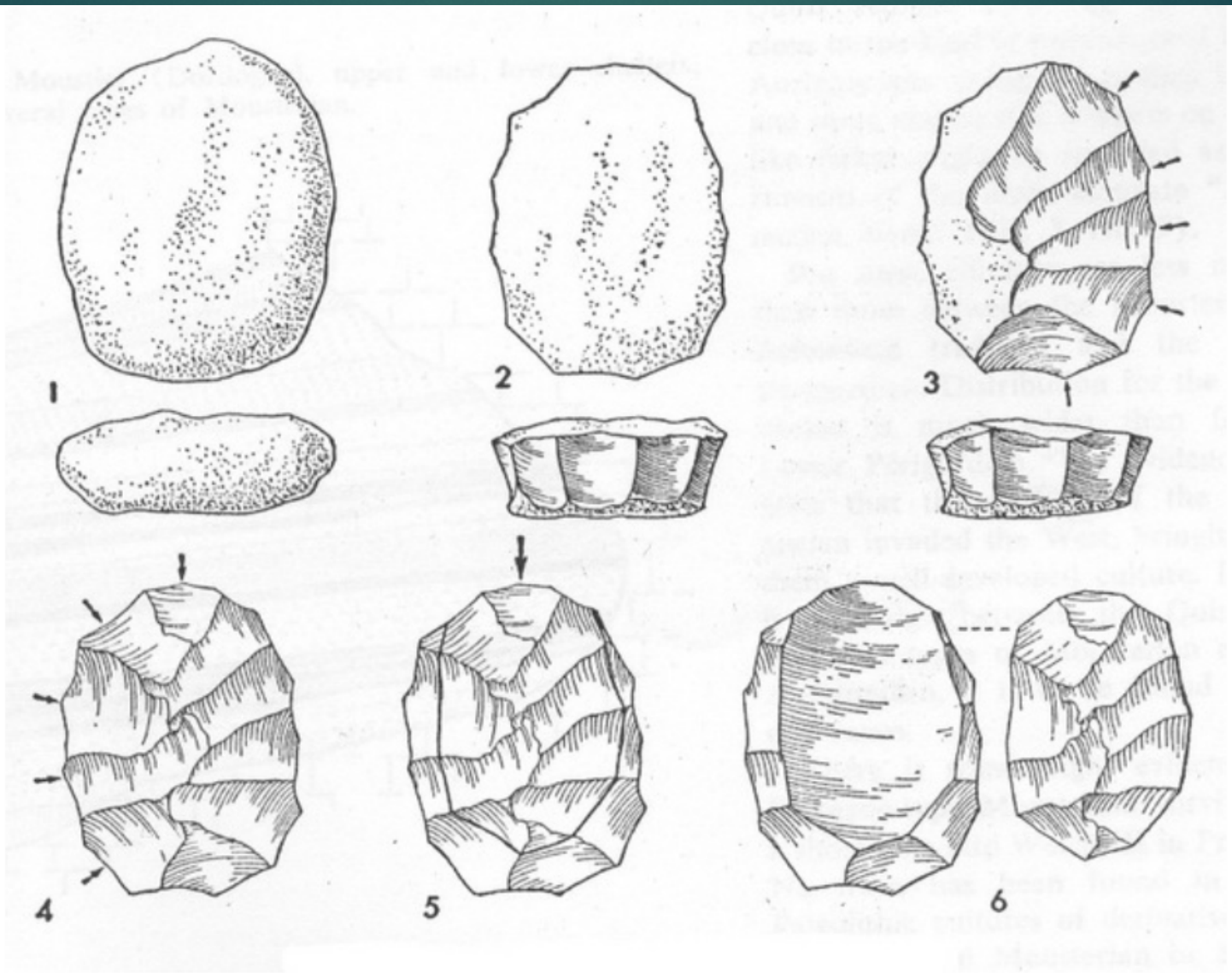
- N Adhesives:
- Bitumen

- Ochre for hafting and as sunscreen

- Birch bark tar

- Pine tar mixed with beeswax, then heated - Grotta del Fossellone and Grotta di Sant'Agostino

Lavallois methodology: oval or triangular flakes

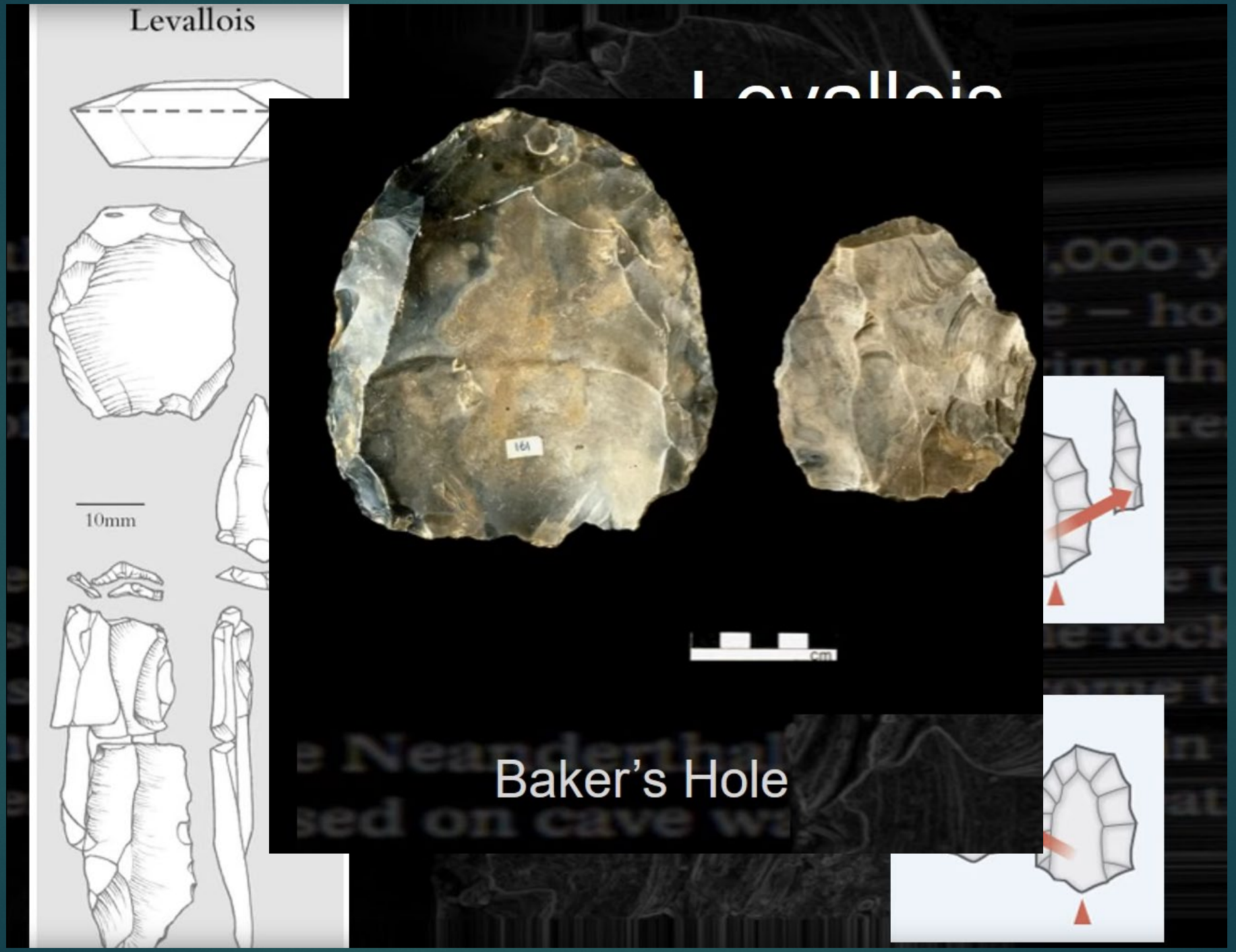


Levallois technique

- Levallois: By shaping the base and preparing special side zones to be struck, it was possible to guide how flakes came off the upper surface, controlling their shape and size.

- By taking off small, preparatory flakes in different patterns across the upper surface, Neanderthals created outlines that directed the kinetic energy of subsequent removals.

- By varying the preparation phase, they could produce massive flakes, long blades or even triangular points, sometimes making several in sequence before needing to reshape the surfaces.


Levallois
10mm
Levallois
Baker's Hole

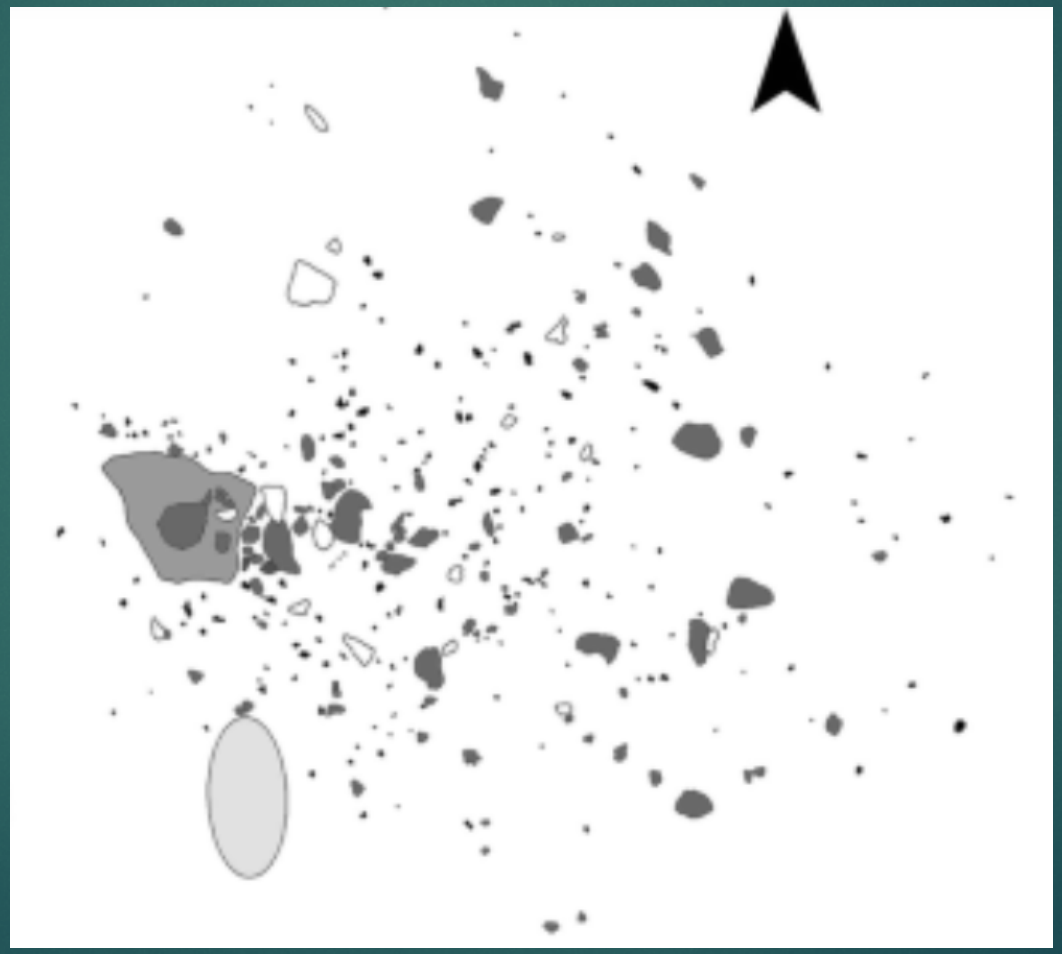
Refitting Levallois stone tools

- When archaeologists began refitting knapped artefacts back together, it transformed our understanding of Levallois, and other Neanderthal technologies.

- Truly 'slow science', it is meticulous, time-consuming work - an immense 4D jigsaw - and demands well-preserved sites.

- For the first time it was possible to reconstruct the thought processes and choices made by individual Neanderthals, revealing dynamic responses to each block of stone.

Refitting: technique of recreating the stone knapping process of a single stone tool



Retouching

- The benefit in technological terms of Levallois and other 'prepared core' methods is that Neanderthals now had reliable ways to get particular products, especially large, thin flakes.
  - Levallois flakes weren't much good for truly heavy-duty stuff,
  - but for the same weight of stone, highly portable Levallois flakes gave far greater amounts of cutting edge.
  - They were far more easily retouched.

Retouching

- **Retouching** is the act of producing scars on a stone flake after the ventral surface has been created

- Retouching defines the Middle Paleolithic.

- Neanderthals retouched a flake in order to adjust its edge to match a particular task: blunting for scraping, creating notches or serrations for shaving and sawing.

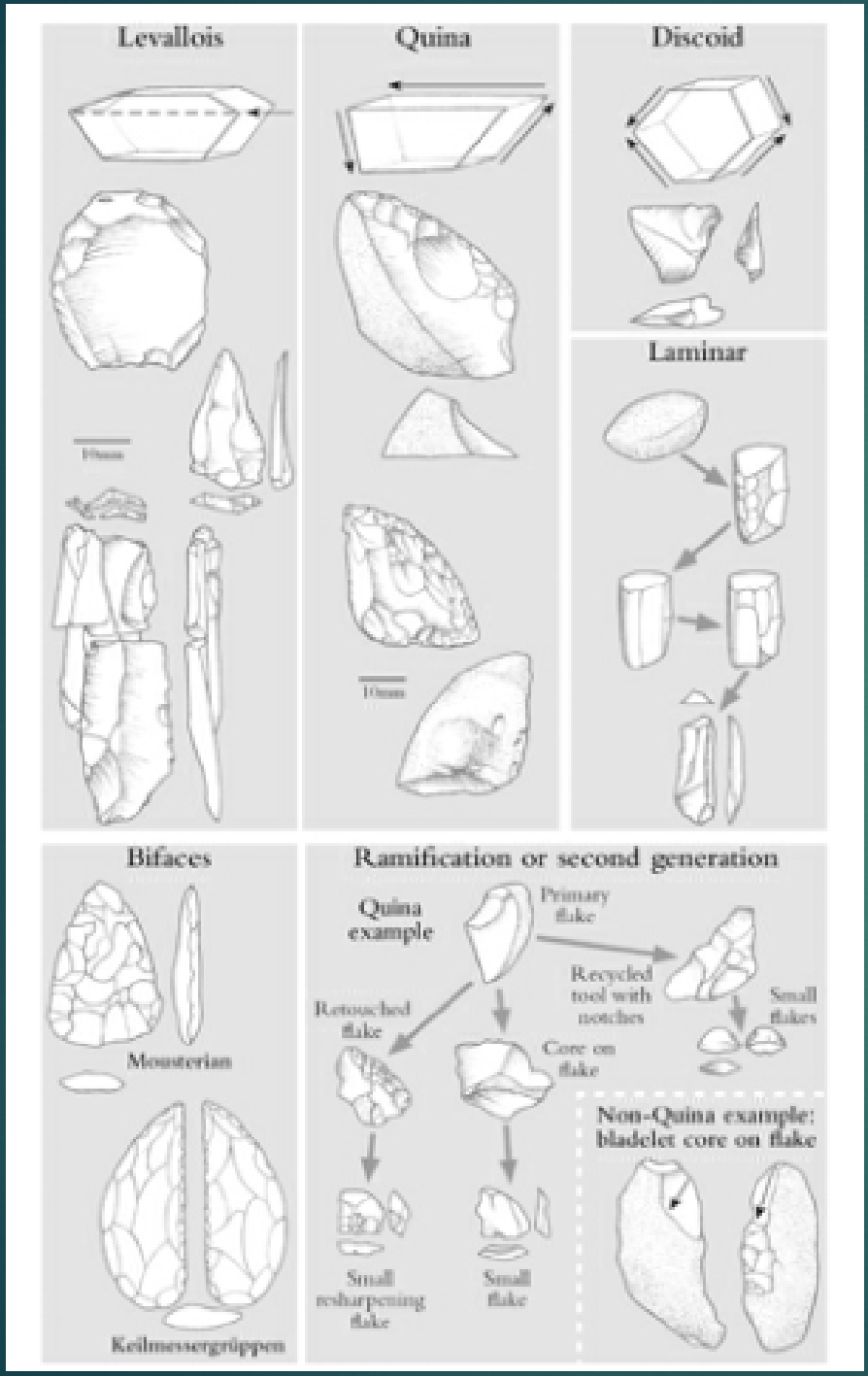
- Most retouching was about resharpening edges.

Sharper flakes = longer distances travelled

- Fresh flakes quickly lose their razor-sharpness, but it can be maintained by shallow, thin removals using soft hammers along the edge.
- Impact of systematic resharpening: It expanded the scale at which Neanderthals were active.
- Longer-lasting flakes that were easily carried allowed them to move around over greater distances.

Sharper flakes = longer trips

- Proof that this was going on comes from refitted Levallois knapping sequences where the flakes are missing having been taken elsewhere, and from geological sourcing.
- Universally, Levallois and retouched tools were the most far-travelled N objects.
- These new ways of engaging with stone meant Neanderthals were ranging across the landscape farther than any hominins before.



- N Techno-complexes:
- Discoid (some cores are disc-shaped) and Quina (named for the type site), were just as systematic as Levallois, but aimed at producing flakes with a sharp edge directly opposite a blunt one (a 'margin'), providing built-in natural ergonomics.

Discoid technology

- What makes Discoid truly distinctive is that the flakes were very rarely retouched.
- Tend to be made using nearby stone, within 10 miles
- In contrast, in the average Levallois and Quina assemblage, a number of artefacts will be made from rock from distant sources.

Discoid

- First, Discoid technology was specialized, yet somewhat disposable: the flakes weren't intended to last long and be transported elsewhere.

- Second, Could only have suited Neanderthals who knew the local rock resources extremely well, and weren't regularly moving long distances.

Quina

- The last key techno-complex made by Western European Neanderthals was the Quina

- Prehistorians originally focused on its distinctive, steeply retouched scraping tools, but in recent decades attention shifted to how it worked as a system for making big flakes.

- Unlike Levallois, Quina flakes bit away at the cores, rather than shaved across them. In this sense it's conceptually more like Discoid, but rather than fat chunks, Quina flakes are like badly sliced bread, one edge thicker than the other.

Quina

- This made the Quina similarly efficient to Discoid, with little initial shaping or ongoing core maintenance needed.
- The Quina was all about getting the longest blades
- For Neanderthals, Quina combined low waste with abundant, ready-to-use flakes that could withstand heavy use and resharpening.
- It's fundamentally about anticipating future tool maintenance, both within sites and during longer movements across the landscape.

Late Middle Paleolithic regional lithic entities and social networks

- The LMP therefore can now at least be considered broadly equivalent to the 'behaviorally modern' Middle Stone Age (MSA) of Africa in terms of pigment use, personal ornamentation and probably also engraving traditions

- The European LMP equivalent to Middle Stone Age lithic points are bifaces.

- The western European Mousterian of Acheulean Tradition (MTA) is a sub-set of the Mousterian technocomplex defined by Bordes, and comprises those assemblages with bifaces, which tend to be broadly cordiform and symmetrically manufactured.

Lithics

- Chronologically juxtaposed with the MTA but found in central and eastern Europe is a lithic technocomplex generally termed the Micoquian, Keilmessergruppe or more recently Mousterian with Micoquian Option-B.

- This industry features a completely different bifacial tradition to the MTA, with conceptually different manufacturing and maintenance techniques, also lacking any imposition of symmetry.

- Bifaces in the MTA and Micoquian plainly represent separate traditions.

Micoquien bifaces: asymmetrical

- The **Micoquien** is an early middle paleolithic industry, that is found in the Eemian and in an early episode of the Würm glaciation (about 130 to 60 Ka).
- The Micoquien is distinguished technologically by the appearance of distinctly asymmetrical bifaces. all of Eastern Europe and Central Europe.

Quina associated with cold period with reindeer

- The full Quina 'package' :
  - 80 Ka, during the MIS 4 glacial.
  - largely gone by 50 ka,
  - primarily found in southern France.

- The universal feature of all Quina sites is the presence of huge amounts of reindeer.

- The MIS 4 glacial caused a decimation in almost all prey species, (i.e. hyenas basically abandoning south-west France). In this bitterly cold tundra world, reindeer may have been the only decent-sized game available.

Quina: only tundra and reindeer

- Most striking is that brief, less ice-blasted phases during MIS 4 were enough in some areas for forest-adapted red and even roe deer to reappear, if only temporarily. But they're never found with Quina assemblages, only Levallois.

- The Quina techno-complex really was specialized, and represented a connection to open tundra south-west France and the large reindeer herds they contained.

- Interestingly, many Quina sites, including Jonzac, Les Pradelles, Pech de l'Azé IV and Roc de Marsal, lack hearths and abundant charcoal. Fires may have been outside of caves

Ns produced blades

- However cleverly Neanderthals made flakes, for many decades it was believed that they were unable to produce lithic blades, which define the subsequent Upper Palaeolithic culture made by *H. sapiens*.

- Neanderthals did develop blades from around 300 Ka, producing large, wide examples as part of the Levallois system.

- Later, they also began to experiment with true blade - or laminar - technology: defined by products twice as long as they are wide.

N blades – not persistent

- There was still a distinctly Neanderthal 'flavor' to this technology, however: unlike UP knappers, they used stone hammers instead of bone. But these weren't sub-standard, and could be impressively large: some blades over 4 in. long.

- The most striking Neanderthal 'blade culture' took place in northwest Europe, where blades were quite common in some sites for about 20,000 years, often alongside Levallois flaking.

- Yet this phenomenon didn't persist. Blades do appear again elsewhere, but they're never dominant - nearly absent in some areas like Iberia - and quite variable.

Blades = better?

- It's long been assumed that laminar technology must be better since later *H. sapiens* made more of it, but what did it actually offer?

- Experiments suggest blades aren't vastly more economical than flakes, or better for slicing. Moreover, they can barely be resharpened and by themselves are no good for long-term use.

N bifaces

- Though typically rare in the earlier Middle Palaeolithic, from about 150 ka there's a resurgence in bifaces as part of growing technological diversity.
- Ns used bifaces as multi-purpose tools with edges that could effectively pierce, slice or scrape materials.
- Use-wear shows that they were used on materials from meat to wood.

N bifaces

- Bifaces could be nearly as long-lived and far-travelled as things like Levallois flakes or Quina scrapers.

- A single layer at the Pech de l'Azé I rocksheiter contains nearly 25,000 distinctive biface shaping flakes. The average knapper produces fewer than 50 during initial production, so over 500 bifaces must have been made here. Yet very few were actually found: clearly, after making them, Neanderthals were taking them elsewhere.

Temporal tool progression

- One enduring legacy of Bordes's N stone typology is that the different stone assemblage types do seem to show a chronological pattern when compared stratigraphically between numerous sites.

- Across south-west France, Neanderthals were making a lot of Levallois-rich assemblages from 130-70 Ka, but far less so as time went on.
  - Instead, from 71-57 Ka, the Quina techno-complex appears,
  - but it was then itself succeeded by growing amounts of Discoid technology
  - as well as some assemblages with numerous bifaces.

Colder climate: more bifaces

- The end of MIS 5 (71 Ka) witnessed rapid, dramatic, repeated cycles from warm to cold.
- Neanderthals are most clearly visible when the forests rebounded, and once again they're making a range of lithics.
- But as it got colder and massive aridity led to vast steppe taking over, bifaces become important for the first time in hundreds of thousands of years

Transitions

- In the space of 10 generations, full-on glacial conditions kicked in at the beginning of MIS 4 (71 Ka), and though Neanderthals making large Levallois flakes pop up during brief thawings, eventually northern France seems to have been abandoned.

- While Neanderthals re-materialized almost immediately with rising temperatures, culturally they now looked very similar to those from south-west France.

- Levallois points and true blades vanish for good, but is this because
  - they were no longer useful, having been developed in earlier forest-steppe environments, or
  - were they the work of unique Neanderthal cultures that went extinct during MIS 5?

Geographic differences in stone technology

- Blades, bifaces and points all occur with Discoid and Levallois, but never with each other; these were either fulfilling very specific functions at particular places, or reflecting cultural traditions.

- Beyond northern France, a distinct 'biface divide' splits Europe down the middle, with the west as a Mousterian world, where bifaces followed ancient traditions.

- In contrast, Neanderthals in central-eastern Europe developed a very different way of doing bifaces. Known collectively as the 'Micoquien', they're defined by asymmetry, with one bifacial sharp edge opposite a natural or artificially blunted margin.

Cultural differences in stone tool use

- Mousterian- and Micoquien-making Neanderthal knappers lived at the same time, used both Levallois and Discoid for flake production and hunted similar species.

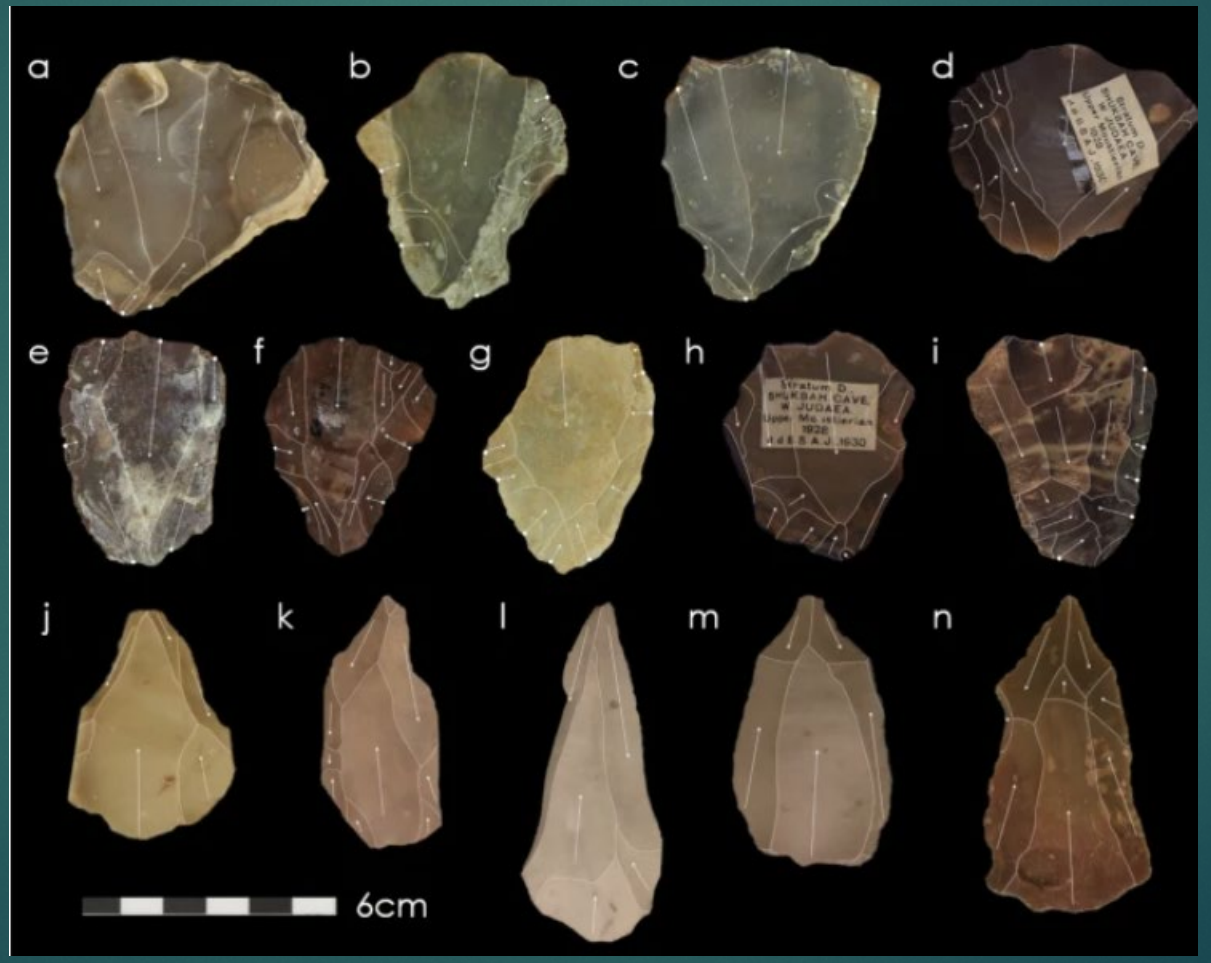
- But different geographic Ns held totally different ideas on what a biface was, from how it should be made to resharpening methods.

- Clearly there was a cultural border of some sort, but unpicking whether it was to do with populations who never came into contact, or something more subtle, remains unknown.

Different traditions

- And enigmas also exist about the main techno-complexes.
- Discoid and Levallois were apparently widely known technologies, yet wherever we find Discoid, it's almost always the only method being used.

Nubian Levallois in Levant: Originally attributed to African *sapiens*, but in fact were knapped by Neandertals



Different stone cultures

- The possibility that particular techno-complexes were adaptations to certain environments is appealing, but for neither Levallois nor Discoid lithics does it really hold up.
- Moreover, there's very little evidence from use-wear that the tasks they were used for were any different.
- The Quina: quite restricted geographically, shows a strong climatic correlation and is never found with any other core technology. This could therefore represent a particular way of Neanderthal life.

Quina

- Different N cultures across the continent?:
  - the Quina appears in southern France right around the time blade technology disappears in the north,
  - and later fades out just as bifaces increase in importance.

- For the last 40,000 years of their existence,
  - Neanderthals were manifestly experiencing massive upheavals in climate
  - and potentially also population disruption,
  - but rather than failing to adapt, their archaeological record is brimming with evidence of innovation and cultural evolution.

++ Neandertal life histories

Classic N collections

- Krapina, Croatia: 900 N bones, 25 Ns
- El Sidròn, Spain: one of largest collection, 2500 bones, 13 Ns - 4 women, 3 men, 3 teenagers, 2 children and 1 baby.
- Sima de los Huesos, Spain: 28 Ns
- Chagyrskaya: 11 Ns

Classic N physiology

- Though they shared our massively inflated brains relative to other hominins, Neanderthal skulls are shaped very differently.
- Flatter skulls gave them a more aerodynamic, sculpted look, finished by an obvious bump just above the neck (occipital bun).
- Larger and deeper-set eyes; with swept-back cheekbones. Large arched brow ridges; not centrally separated like your brows, and much more imposing. Retromolar gap behind their teeth. Large front teeth with a ‘shovel’-like shape. Back teeth had massive fused roots. Longer thumb; more flared fingertips.
- We want reasons for all the above, but in fact evolution via natural selection is simply about reproductive success.

Very High Daily Energy Requirements in Ns

- Ns were muscularly built people.
- Neanderthals had higher daily energy requirements than MHs
- Neanderthal metabolic need ranged from 3000 to 5500 kcal/day
- Modern human populations ranged from 2720 +/- 607 kcal/day
- How much Caribou: 2000 kcal per kilo; N would need to eat 4.5 lbs per day; 10 Ns require 2 caribou per week; 35% higher than wolves eat

Sorensen MV, Leonard WR, 200

Neanderthals were “thin on the ground”

- Population size:
  - Lived in groups of 15-30
  - Always a small population: “Thin on the ground”
  - Total population in Eurasia = 5,000 to 70,000 (JP Bocquet-Appel - 2013); Hawks: there were never more than 100 K Ns total
  - Genetic studies show that (late) Neandertal populations had small effective population sizes

Thin on the ground

- Subjected to genetic bottlenecks due to fluctuating climatic changes, which produced repeated population crashes with significantly low genetic diversity
- Eventual significant familial inbreeding; El Sidrón Cave: family of 13
- But some newer studies indicate some N locations had more genetic variation.

Neanderthals were “thin on the ground”:

- Population size:
  - Old theory that Neandertals groups limited themselves to a single river valley and only occasionally ventured farther afield is refuted by abundant evidence for transport of raw materials across major rivers
  - Dogandžić and McPherron extensive review show in detail that the Mellars and French analysis (MHs were 10 x more numerous than Ns) is severely flawed; MHs did not have larger populations circa 50-60 Ka

Ns had demographic problems

By and large Neandertal populations were small

- Small populations go extinct all the time for stochastic (random) reasons:
  - N had small group sizes,
  - Number of Ns in group: Like all modern HGs, Ns are believed to have lived in groups that averaged 15-25 people;
  - Lower birth rates: If low fertility rate, population will crash
  - Higher mortality rates,
  - Increased family inbreeding;
  - Decline in genetic diversity

Ns and MHs overlap

- Ns were not alone: Ns have been living along with other groups in Asia: Denisovans, *H. erectus*, eventually MHs
- Interbreeding with African sapiens began sporadically long before 45-60 Ka
- Basic compatibility between Ns and MHs, given interbreeding and care of hybrid children
- Multiple initial MHs OoA at 45 Ka in Russia, Romania, Croatia with N ancestry; but these became genetically extinct lines
- By 40 Ka, Ns are gone; variation in demise in different regions; unclear of timing of Denisovan demise
- No archeological evidence of N-MH conflict

N Statistics ?

- Half of all N fossils are children under age 11
  - 50% of N children died before reaching adolescence
  - defects in dental enamel point to starvation as 1 of possible cause
- 2 of 3 Ns never reached age 30; 4 of 5 Ns never reached age 45
- All adult N fossils have healed traumatic injuries to skeleton

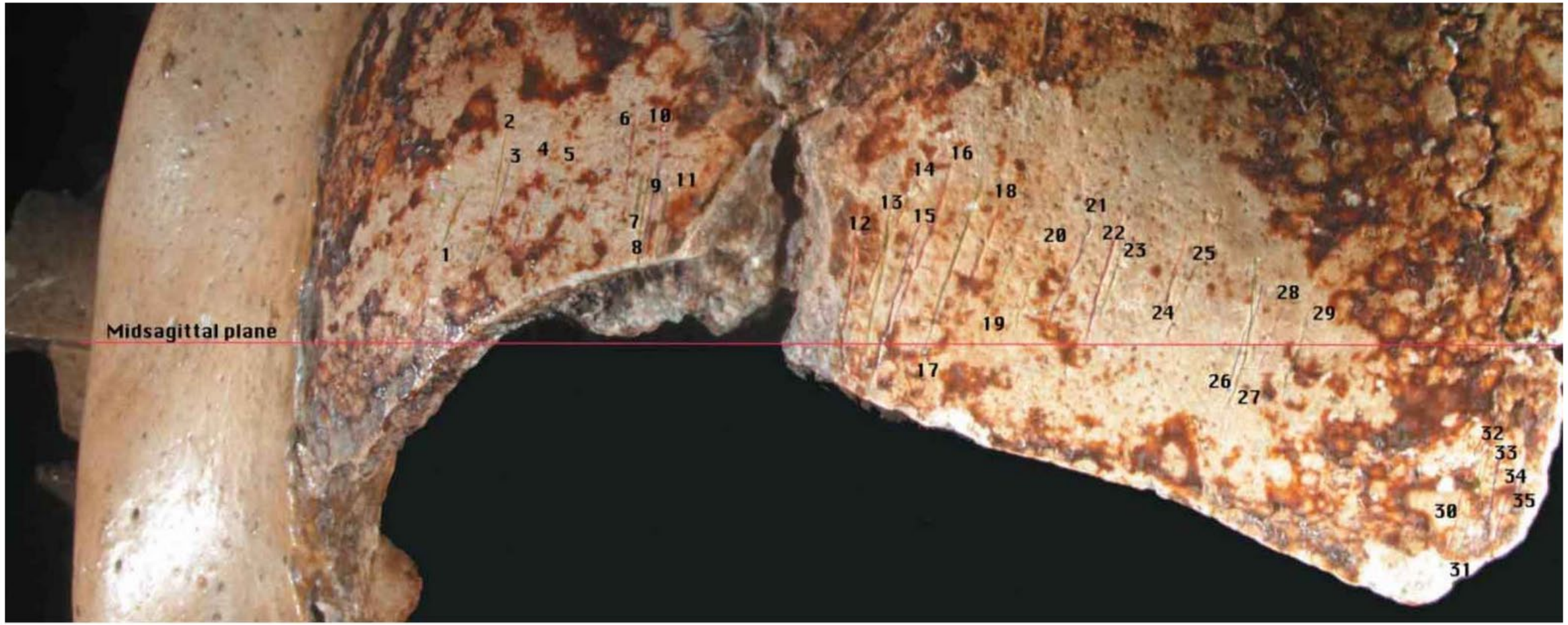
Krapina, Croatia –130-120 Ka

- Krapina: All the bones are heavily broken and fragmented, but most of the fragmentation occurred long after death.

- More than 900 fossils of early Neandertals were excavated at Krapina in 1899 and 1900 by Dragutin Gorjanović-Kramberger from a rock shelter in a sandstone cliff outside the town.

- The sample of skeletal remains from Krapina is still one of the largest samples of fossil hominins anywhere, more than 120 years after their discovery. The skeletal remains represent more than 25 individuals, and all of them are very fragmented

Incised Krapina skull



Cutmarks on the frontal bone of the Krapina 3 skull. Photo from research by David Frayer and

Bone fragmentation at Krapina

- Anthropologists have debated the role of cultural and natural processes in what happened to the Krapina individuals.
- Lots of theories: Some have favored the idea that other Neandertals ate the bodies and discarded the remains. Others have suggested that the individuals had died elsewhere, and their family or group later relocated some of their bones to this rockshelter, a practice known as secondary burial..
- The Krapina Neandertals died young. There were many children in the sample, and the adults all seemed to have been less than thirty years of age. Indeed, only three or four individuals were clearly older than twenty. This sample of individuals died very young.

N mortality and stress

- Later study of N age indicates few Ns survived past age 30; just the same as early humans from Skhūl and Qafzeh; but later UP MHs lived longer.

- The high level of mortality that we are seeing for younger adults must have had enormous effects on Neandertal cultural and social systems.

- Two of the Krapina individuals with indeterminate sex had significant stress events within two years of their deaths

Le Moustier 1 - adolescent

Le Moustier 1: Likely a boy aged between 11 and 15 years of age, he's the most complete adolescent Neanderthal known.

His skull had the classic long, narrow form, its widest point towards the back, but he looks to have been in the middle of growth spurts.

Huge eye sockets, large brain.

Shorter N Development & similar life expectancy

- Shorter developmental period & dependency: Neanderthal children grew faster than modern human children: (via teeth growth marks); Le Moustier 12 yo showed 16 yo maturation

- Erik Trinkaus analyzed fossil records to gauge the adult life spans of Neanderthals and early modern humans and found:
  - roughly the same number of 20- to 40-year-old adults and adults older than 40 in both Neanderthal and early modern human populations, suggesting life expectancy was probably the same for both.

N teeth

- Taurodontism, a marked expansion of the pulp cavities in the deciduous and permanent mandibular molars, is characteristic of many Neandertals; but not unique to them.
- The incisors and canines of Neandertals, especially the early ones, are large.
- The large size of the front teeth is not always evident in a Neandertal skull, because the big crowns of these teeth may be completely worn away. Neandertal incisors and canines are usually very heavily worn.
- In some cases, the wear was so severe that it laid open the soft tissues in the pulp cavity, exposing the individual to both extreme pain and life-threatening infection

The use of the Neandertals' anterior teeth as tools.

- What were Neandertals doing with their anterior teeth that caused that heavy wear and favored the evolution of their specialized morphology?

- Perhaps, like some modern foraging peoples, they used their front teeth a lot for holding or working hides and wood, or even for retouching stone implements.

- This pattern of anterior dental wear in Neandertals most closely matched Inuit (Eskimo) populations, and that the degree of wear among Inuit was directly related to the oral preparation of animal hides.

N children

- N children: Born physically stronger than us, intense activity further toughened their little bodies.

- Even before the age of 10, in Uzbekistan, the Teshik-Tash child's legs must have walked huge amounts, while Le Moustier 1's teenage arms were almost as muscular as an adult's.

- Youngsters' teeth also show them practicing or joining in with adult tasks: at Sima de los Huesos, older children and teenagers had already begun to wear off their enamel.

N children’s teeth & possibly smaller utensils

- The presence of dental wear in very little children points to at least some imitation by children; the enamel on a 3-year-old's front tooth from Combe Grenal was already worn away, potentially from tooth clamping.

- But there's an intriguing clue to something more from wear on the El Sidrón 1 boy's teeth.

- Dental micro-wear shows he'd learned to eat by using a lithic tool to slice off food held in his mouth, but compared to older individuals, his scratches are much narrower. Either this was due to lack of confidence and tentative motions, or perhaps more likely he was using smaller, thin-edged artefacts.

N childhood = active

- But, in general, muscle markings and bone development show that all children were highly active.

- Youngsters certainly begin mimicking – or were taught – key life skills. Wear and tiny scratches show that nine- or 10-year-olds were nimble enough to slice food held in their teeth, while even smaller children's mouths must have ached from holding or chewing materials, perhaps animal skins.

N children

- But even children have some distinctive clamping wear, suggesting that hide working was one thing they started to help with early on.

- Overall, children's tooth micro-wear increases with age, but it's more complex than just greater amounts of mouth use.

- Micro-scratches in the young boy from El Sidrón were not only fewer but also diagonal, rather than vertical. This means he'd learned to eat like a grown-up using a lithic, but wasn't really doing a lot of other tasks with his mouth. Their overall tooth damage pattern on average resembles women's more than men's.

Stress in N children

- Study of the teeth of two Neanderthal kids (who lived until they were teens or young adults), at 250 Ka in Payre, France.

- Tooth enamel:
  - child was born in the spring
  - weaned before winter at 2.5 years of age.
  - experienced extreme wintertime stress,
  - including probable weight loss
  - exposure to toxic lead at least twice

Smith *et al.*, 2019

Teeth growth interruption lines

- Teeth growth interruption lines, quite common in Neanderthals and long claimed to show they suffered periods of childhood starvation.

- All the El Sidrón individuals had them, from ages 4 to 12. Some there and elsewhere like Le Moustier 1 have multiple such phases. But it's not universal, and others had none.

- While interruption lines can be due to malnutrition, mostly they record systemic bodily stress such as a serious viral illness or infection. Moreover, Neanderthals weren't more afflicted than other human groups

- Ns had lots of dental problems.

Burden in the Bones

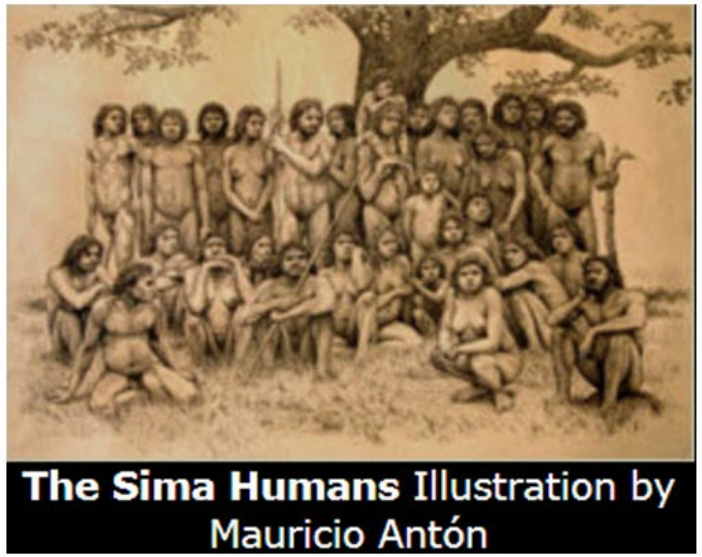
- Most complete N skeletons have at least 1 affliction whether illness or injury, and sometimes a veritable ‘series of unfortunate events’ befell them.

- Yet at the same time, modern research is tending to show that while Neanderthals certainly had it tough, it wasn’t necessarily worse than for other humans living in such challenging environments.

- Age: The apparent rarity of individuals over 50 is common across the archaeological record of all periods, since accurately identifying age beyond that is tricky and elderly bones tend to be more fragile

Sima de los Huesos (Pit of the Bones), Atapuerca, Spain

Sima de los Huesos, Atapuerca, Spain



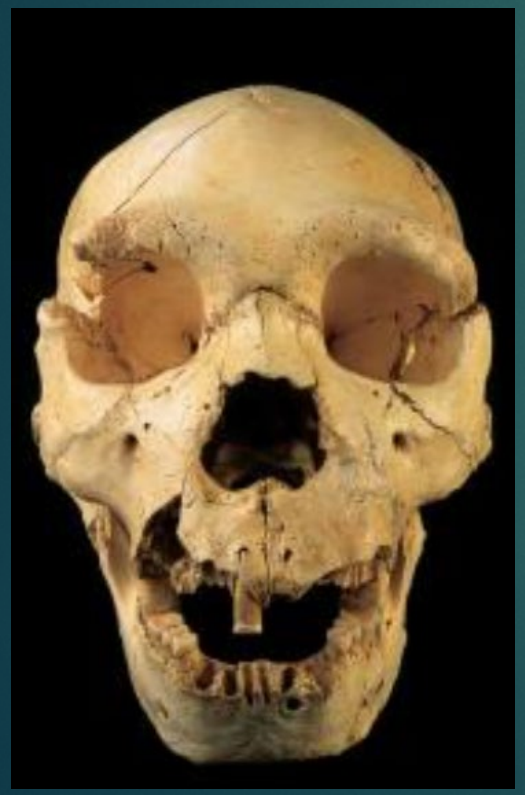
Sima de los Huesos
Homo heidelbergensis hominins, 400K

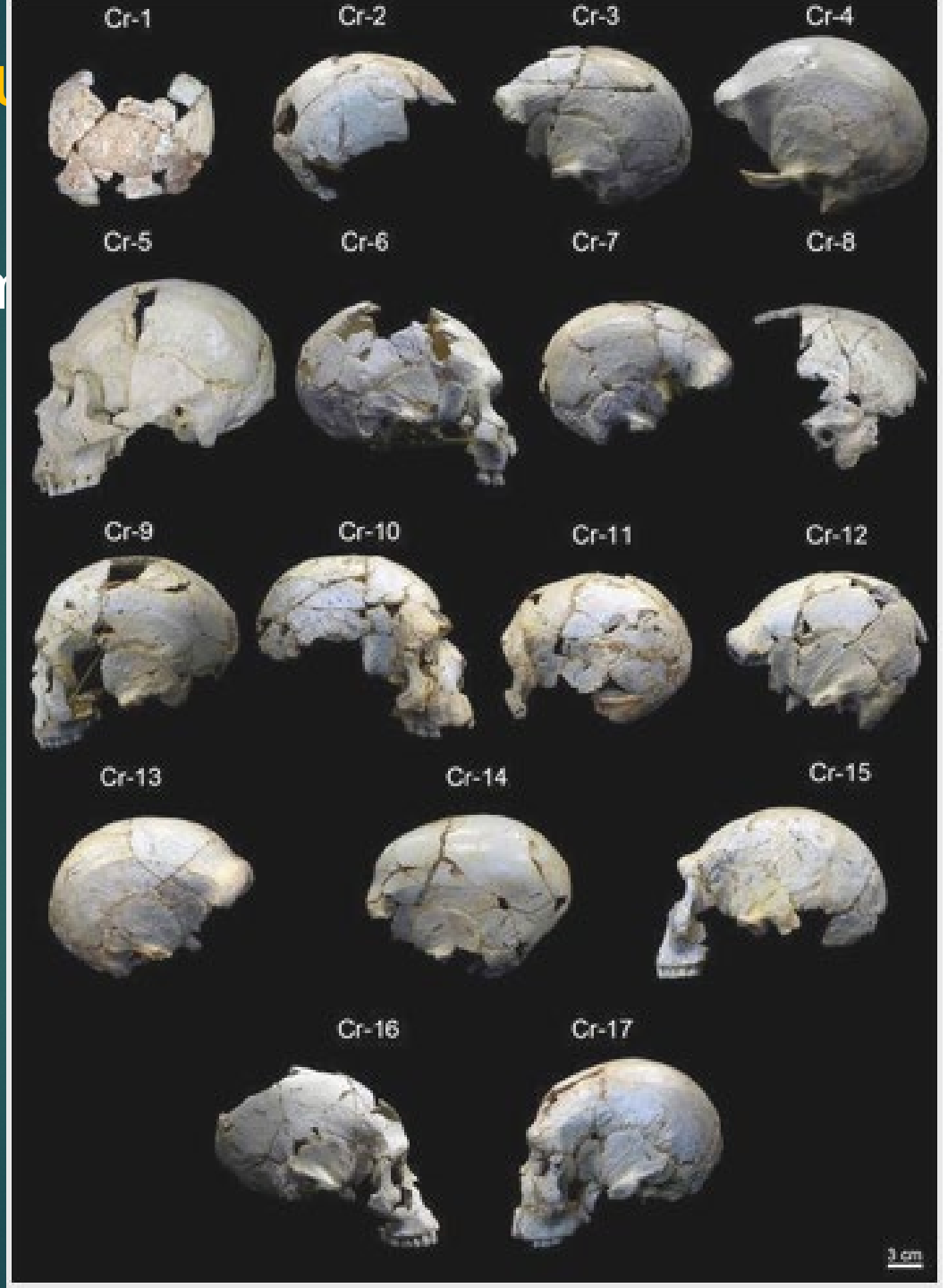
Human fossils, Sima de los Huesos
E436/0172 Rights Managed

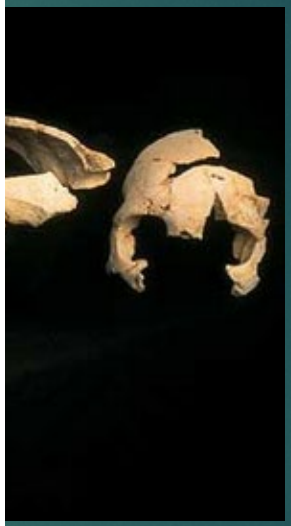
28 people's body parts from 430 Ka (7000 bones)

Sima de los Hu ; ave 1232 cc

- 17 skulls from
- Atapuerca, S







Human revolution that wasn't – McBrearty & Brooks

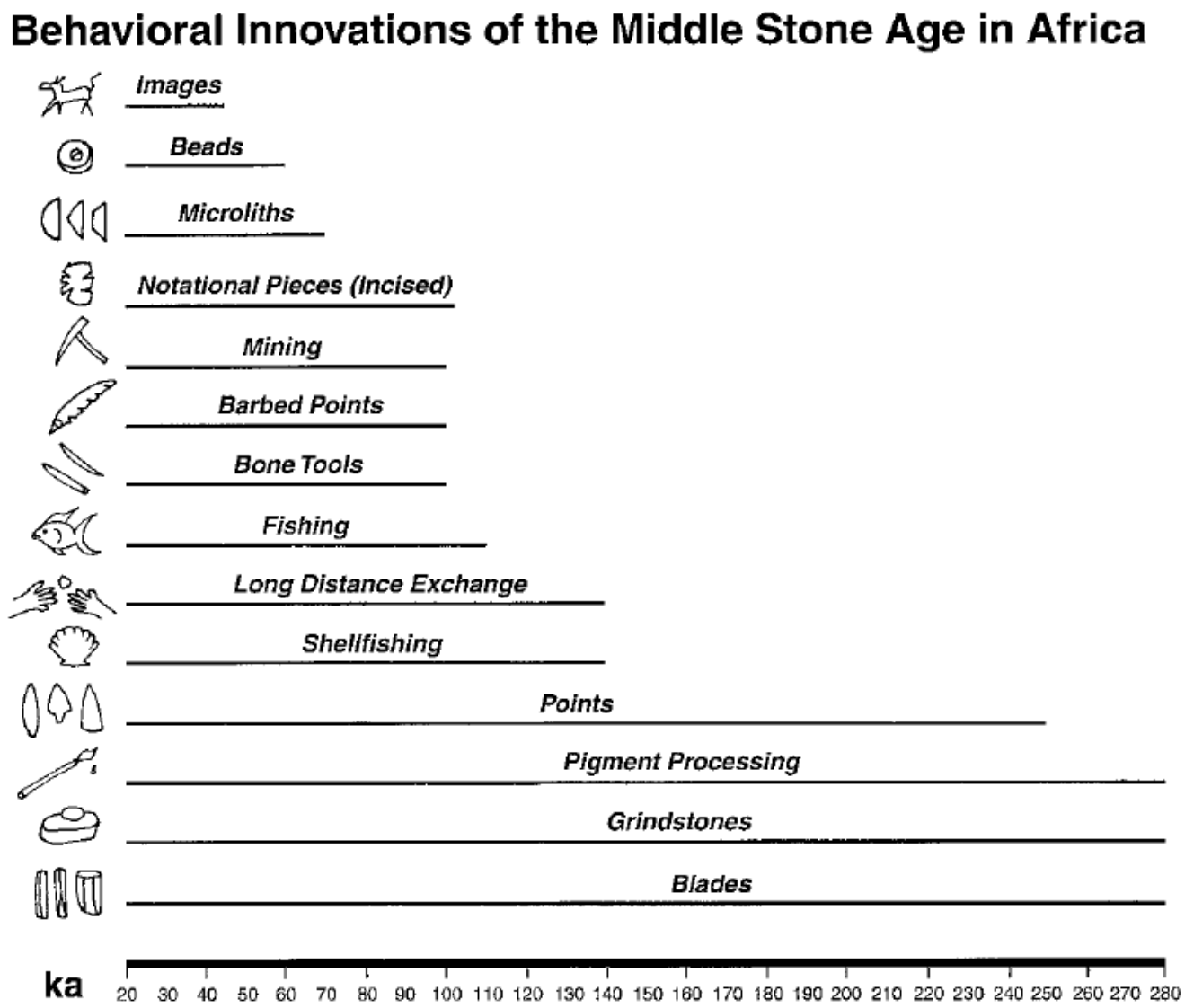


Figure 13. Modern behaviors and their time depths in Africa. © Sally McBrearty & Alison S. Brooks.

This view of events stems from a profound Eurocentric bias and a failure to appreciate the depth and breadth of the African archaeological record.

In fact, many of the components of the ''human revolution'' claimed to appear at 40–50 ka are found in the African Middle Stone Age tens of thousands of years earlier

Many of Ns greatest advances occurred after 60K

- Burials increased (have more N bones from this period)
- Increased distance that they transported stone to make tools
- Use of feathers for ornamentation
- Experimentation with more colors & started perforating shells
- Similar to “modern human behaviors” of same period

J. Hawks: N vs MH modern behavior activity comparison

- ~100 Ka and after: N sites and activities are similar to MSA MH in Africa
- Similar spatial organization in home sites
- Similar transport of material (but African MHs longer distances, i.e. obsidian in Ethiopia)
- Use of grains: In Africa, 80 Ka, storage of grains; Ns were using grains 100 Ka
- Use of shells: MHs = Blombos, S Africa, 75 Ka & Qafzeh Cave in Israel, circa 92 Ka; and Skhul Cave; and Ns circa 100 Ka
- Pigments: In Europe, Ns at 200 K and esp. at 50 Ka; in Africa, 80 Ka

Neandertals: Seafaring

- Neandertal tools found on the Greek Ionian islands of Lefkada, Kefalonia and Zakynthos and on Crete
- Seafaring most likely started some time between 110 and 35 ka and the seafarers were the Neanderthals; but 1 study: at Naxos at 200 Ka
- Islands were 12 miles from mainland
- Made wooden dugout canoes?

George Ferentinos, et al., 2012

Sheanderthals: female Ns = just scenery?

- The first ever sketch of a living Neanderthal imagined the owner of the Forbes skull (a female N), doodled (during a meeting) by the biologist Thomas Huxley in 1864.
- Its decidedly simian features have no hint of female character.
- In fact, for most of the subsequent 160 years, female Neanderthals – if featured at all – tend to be fewer in number, peripherally located, and limited to 'domesticated' activities including childcare and skin-working.

Women's body

- Neanderthal women very likely did hunt some or much of the smaller game we find in sites, such as tortoise, rabbits and birds – and probably accompanied by babies and children.

- One of the most convincing reasons to believe that Neanderthal women *did* experience life differently is the testimony of their own bodies.

- N women's thighs were as strong relatively as men's, their *lower* legs appear less intensively used. Impression is of different habits in moving around, with men perhaps scaling more rough terrain.

N Women

- Arms tell a similar story, with women's lower arms getting more of a workout than their biceps

- While Neanderthal men apparently used their right and left arms differently (comparable to the asymmetry in professional tennis players), women's arms were more symmetrically developed. Carrying heavy loads in both hands could cause this.

- But pushing something up and down – or backwards and forwards – with both arms would also fit, which fits hide-working.

N women helped at butchery sites

- Extremely likely that women were wielding butchery tools in processing hunting kills.

- Stone tool evidence: part of this was about skin preparation: gore and membranes from fresh skins leave a particular polish on stone tools, while the laborious scraping of dried hides produces its own distinctive luster.

N women

- Special, round-tipped bone tools for the latter stages of softening and burnishing, called ‘lissoirs’.
- Made from the ribs of larger animals such as bison, crucially they would have needed two hands to use; exactly the pattern we see in Neanderthal women’s arms.
- Moreover, the intensity of tooth wear seen in Neanderthal women resembles that in Indigenous cultures with strong hide-working traditions, such as the Inuit.

N Women

- While initial skin cleaning was done near kill sites and potentially by both men and women, it might be likely that the more time-consuming softening and stretching using mouths and lissoirs was happening at family living sites.

- Aside from archaeological evidence that they had a resource-sharing society, Neanderthal body size doesn't seem to have differed much between the sexes, similar to most *H sapiens* populations, which suggests that violent male competition was not the dominant social structure.

N Women

- Mostly complete female skeletons from Mount Carmel, Palestine. Known as Tabūn 1, her hip bones are partially preserved, and birth canals were shaped differently.

- N babies didn't need to twist, and heads emerged sideways instead of facing backwards. But the babies' longer skulls meant it was still a tight squeeze.

- N babies continued nursing beyond one year old, but were being introduced to solid foods around six or seven months: remarkably similar to many human cultures.

2023 Worldwide survey kills the myth of ‘Man the Hunter’

- Analysis of data from dozens of foraging societies around the world shows that women hunt in at least 79% of these societies, opposing the widespread belief that men exclusively hunt and women exclusively gather.

- A common historical theory holds that, among foraging populations, men have typically hunted animals while women gathered plant products for food.

- Analyzed 391 foraging societies from the past 100 years and identified 63 foraging societies around the world, including societies in North and South America, Africa, Australia, Asia, and the Oceanic region. Women hunted in 80% (50 of those 63 societies); 50% hunted with children

- 33% hunted large game

Abigail Anderson, et al. 2023

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