

The Origins of Language: When, Why and How

By Rick Doble

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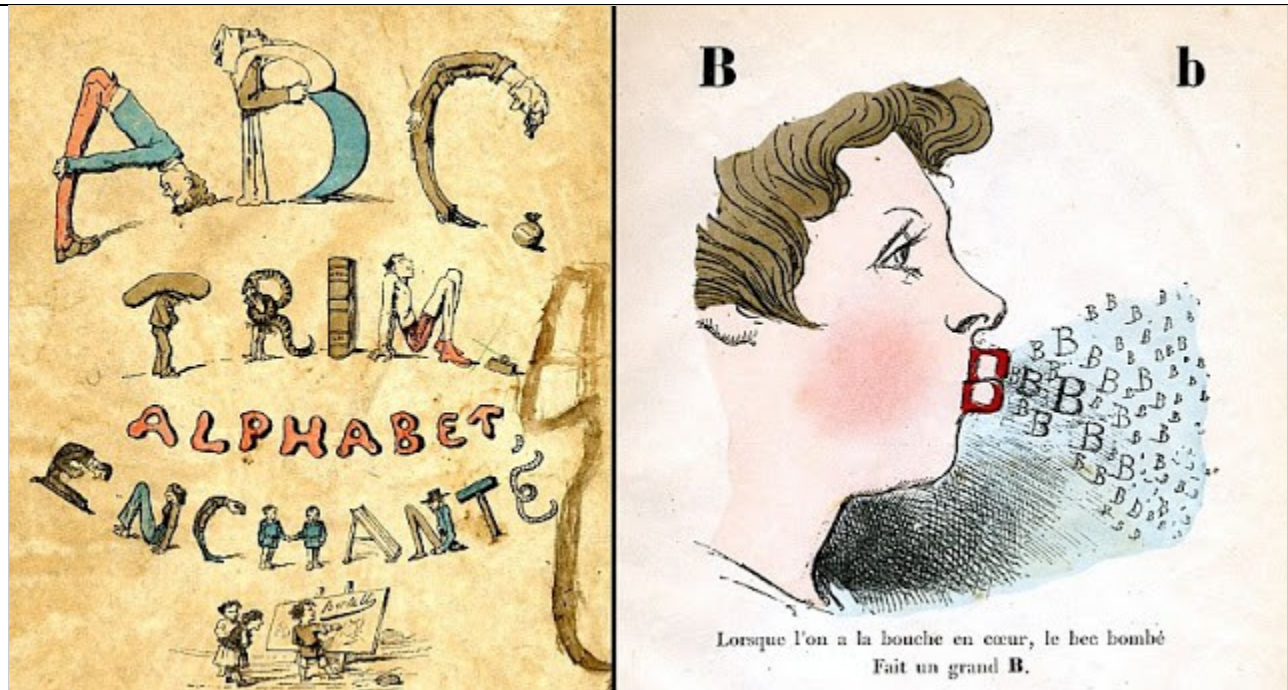
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Abstract:

Although Homo sapiens were anatomically able to talk 150,000 years ago (150 kya), it appears that they did not until about 40 kya when the Upper Paleolithic cultural and symbolic explosion occurred. To date, there has been no satisfactory explanation. This paper attempts to provide an answer as to when a fully developed G1 language came into being and the reasons for the emergence of such a language plus the reasons why the later Paleolithic explosion took so long to develop. Specifically, the abilities of the Homo sapiens' prefrontal cortex, the planning involved with various tool-making and other processes, the development of episodic memory, the growing use of spoken words, and a new understanding of time -- all came together about 100 kya. It then took another 60 ky before this new sensibility led to an established belief system which resulted in the Upper Paleolithic cultural explosion.

Why Didn't We Speak Sooner

"Human beings were anatomically ready to speak more than 150 kya but clear evidence that they were doing so does not appear for 100 ky afterward."

The famous American science journalist, Constance Holden, wrote this and the following about the development of language in her article entitled:

No Last Word on Language Origins

<https://science.sciencemag.org/content/282/5393/1455.abstract>

Fossils show that the raw brain capacity for complex language, along with the necessary mouth and throat anatomy, were probably in place before 150,000 years ago. But most of the behaviors thought to depend on language did not appear until 40,000 years ago--the so-called Upper Paleolithic explosion that is manifested most strikingly in Europe. That was when tools, burials, living sites, and occasional hints of art and personal adornment reveal beings capable of planning and foresight, social organization and mutual assistance, a sense of aesthetics, and a grasp of symbols. "Everybody would accept that by 40,000 years ago, language is everywhere," says Stanford University archaeologist Richard Klein.

Unfortunately, "speech does not fossilize," notes anthropologist John Shea of the State University of New York, Stony Brook...noting that an archaeologist "is like the drunk in the old joke who looks where the light is good" for his lost keys.

Thus paleoanthropology is a game for philosophers as well as scientists, and there is plenty of room for free play of the romantic imagination. [ED: My emphasis.]

Read the full article online:

[https://web.archive.org/web/20050404112132/http://cas.bellarmine.edu/tietjen/images/anthropology\(NoLastWordOnLanguageOrigins.htm](https://web.archive.org/web/20050404112132/http://cas.bellarmine.edu/tietjen/images/anthropology(NoLastWordOnLanguageOrigins.htm)

Since I am not a linguist but I minored in Anthropology for my Master's Degree in Communication, I fall, perhaps, into the philosopher category as mentioned above. And since Constance Holden, the author, has given me permission here, I will try my hand at solving this puzzle.

Setting The Stage For Language

I believe five key elements came together about 100 kya that led to the start of a fully developed language. The linguist, Dr. Daniel Everett, has called this hypothetical first language, a G1 language.

Yet after it was in place 100 kya, I believe it took another 60 ky for the full consequences of this development to occur and for the rich creation of human culture which then led to the Upper Paleolithic explosion 40 kya.

#1. The Prefrontal Cortex

The concepts in language and an ability to work with processes came about largely due to a unique part of the genus Homo brain, called the prefrontal cortex. This recently discovered area of the brain was critical when it came to planning and cognition.

A full description is best left to scientific sources, so what follows are descriptions from scientific websites.

"This part of the association cortex, which is implicated in higher cognition and affect, is thus disproportionately large in humans relative to other primates."

Stern, Peter. *The human prefrontal cortex is special*. Science. Science 22 Jun 2018 : 1311-1312.
<https://science.sciencemag.org/content/360/6395/1311.7>

"It's responsible for planning and decision-making and, according to the new findings, has no equivalent in the monkey brain."

Engelking, Carl. *Brain Area For Decision-Making And Planning Is "Uniquely Human."* Discover Magazine. 2014.
<http://blogs.discovermagazine.com/d-brief/2014/01/30/brain-area-for-decision-making-and-planning-is-uniquely-human/#.XR8X5utJHgw>

"This brain region has been implicated in planning complex cognitive behavior, personality expression, decision making, and moderating social behaviour. The basic activity of this brain region is considered to be orchestration of thoughts and actions in accordance with internal goals."

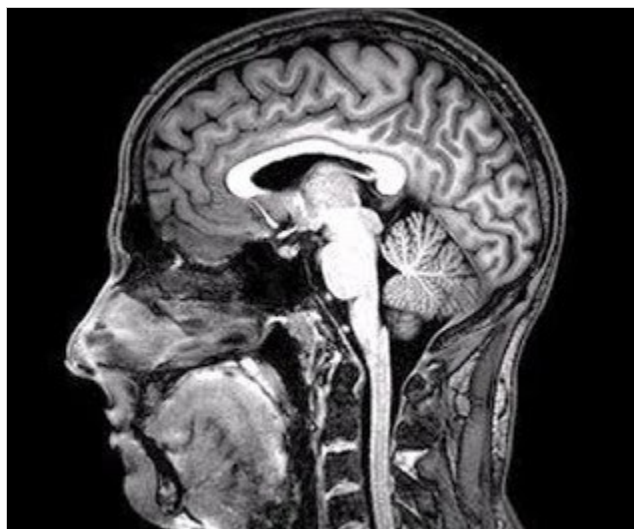
Prefrontal Cortex. The Science Of Psychotherapy. 2017.
<https://www.thescienceofpsychotherapy.com/prefrontal-cortex/>

In other words, the conceptions of language and a proficiency for using and then improving and modifying processes was possible due to this unique part of the human brain. However, it took a million years or more for all of the 'prefrontal cortex' abilities to come into play and to be fully utilized.

See my most popular blog about the prefrontal cortex, I wrote in 2014:

Animal Senses Compared to the Human Sense of Time

<https://deconstructingtime.blogspot.com/2014/08/animal-senses-compared-to-human-sense.html>



#2. Processes

Anthropologists do agree that for over a million years the genus Homo used a series of processes to make stone cutting tools such as hand axes. Over time these processes were refined and expanded and new processes were developed. By 100 kya Homo sapiens used a huge variety of processes, some of which we can only guess about because the materials have decayed, such as the treatment of animal skins and the building of houses with branches and leaves.

“In reality, we know very little. What is conserved in the ground? Stone, bronze, ivory, bone, sometimes pottery. Never wood objects, no fabric or skins. That completely skews our notions about primitive man.”

Pablo Picasso

<https://timelineforhomosapiens.com/2013/12/11/picasso-quotes-and-primitive-art/>

Excerpted from pages 92-102 of Conversations with Picasso by Brassaï, translated by Jane Marie Todd, published by the University of Chicago Press. ©1999 by the University of Chicago.

While we can only guess at the 'softer' technologies that have left little evidence from the Middle Paleolithic era. Here is what a weaving website had to say.

Weaving (a soft technology): The art of weaving...involves the production of fabric or cloth by interlacing two distinct sets of yarns or threads in a right angle...Early civilization called for temporary shelters to be built, so knowing how to twine, plait, knot and weave materials such as grass, twigs, string and twine together, in order to build walls, roofs, bedding, baskets and doors, was imperative. The idea of interlacing materials together to create a weave was probably inspired by nature; by observing birds' nests, spider webs and various animal constructions...*A distinct fabric impression in an archaeological find (Dolni Vestonice), has led scientists to the conclusion that the discovery of weaving actually took place as early as the Paleolithic era.* [ED: My emphasis.]

The History of Weaving. 2014. <https://wildtussah.com/history-weaving-2/>

However, scientists can confirm that many of the processes we do know about were quite sophisticated such as the complex and exacting underground heat treatment of silcrete which turned silcrete into a material that was as workable and useful as flint. But like flint, heat-treated silcrete had properties that meant it could be shaped in predictable ways. (See the Afterword.)

I believe that after more than a million years a sense of linear time developed as the skill of working with processes became increasingly complex, precise, sophisticated and varied. It is quite likely that by 100 kya Homo sapiens were using dozens of processes to make various stone tools and weapons, treat animal fur and skins, sew skins together, fabricate clothes from natural fibers, and make shelters, mats, and baskets.



The progression of stone technology during the Paleolithic era showing the evolution of stone tool processing.
 (Left) Acheulian flint chopper, North Somerset, UK; ca. 750 kya.
 (Middle) Lower Paleolithic flint stone tool, Egypt; ca.200 kya.
 (Right) Bifacial silcrete point; Blombos Cave, South Africa; 71 kya.

While understanding a process was limited to particular materials and desired results, all processes involved a sense of time. Each step had to be done in a certain order, for example, and the eventual outcome was dependent on past steps that had been done correctly. Later processes were almost always more complicated and required more precise conditions for specific lengths of time -- such as the precise heat treatment of silcrete to make it more workable. (See the Afterword.) I believe that over the years, the different orderly steps in a process became the model for time in general but more about this in my next blog.

#3. Memory

While we cannot know the exact memory abilities of Paleolithic people, we do know this. Processes would need to be memorized and then younger members of the tribe would need to learn the processes and memorize the steps. So the teacher would have to be able to remember all the steps, describe them as needed, and then communicate this to an apprentice. Then as time went on the steps became more complicated and more exacting requiring more memory skills.

"The ability to remember has been linked with the ability to perceive time in the past and has been seen as a crucial threshold for a sense of time."

Pathman, Thanujeni et al. "Young Children's Memory for the Times of Personal Past Events." *Journal of cognition and development : official journal of the Cognitive Development Society* vol. 14,1 (2013): 120-140. doi:10.1080/15248372.2011.641185
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3653335/>

NOTE: We do have clear evidence that the memory of some Upper Paleolithic people was remarkable. The painting of a rhino in the Chauvet Cave in France, for example, has been dated to more than 30 kya and the remarkably accurate drawing of a bison in the Cave of Altamira has been dated to about the same period. Both of these paintings were painted from memory as the paintings were created by artists inside deep dark caves

See my popular blog:

The Genius of Cavemen

<https://deconstructingtime.blogspot.com/2013/01/the-genius-of-cavemen.html>



By the Upper Paleolithic, Homo sapiens had remarkable memories. This top picture of a bison was painted from memory using multi-color air brush techniques in the dark Cave of Altamira, about 15 kya. The bottom photo is of an actual bison today.

#4. Early Words

Words must have taken a while to develop and most anthropologists would agree. However, the point of the earliest beginnings has become a heated argument. Dr. Daniel Everett has suggested that its earliest and limited beginnings may have occurred at least a million years earlier than previously thought with *Homo erectus*. *Homo erectus* was capable of making sounds, but not with the wide and varied flexibility of *Homo sapiens* and the complex grammar of modern languages. But, in any case, it seems likely that long before there was a fully developed language, there was a time period when words were evolving and shared verbal communication was developing.

#5. Linear Time

The last and most recent critical element was a sense of time. During the Lower Paleolithic era, an understanding of time by *Homo sapiens* began to diverge from the animal sense of time, i.e., animal time which was living in the moment and responding to cyclical changes such as sunrise and sunset or changes in the seasons.

Homo sapiens were the first species (and still the only species) to understand 'when' in time -- when in the past, when in the near present and when in the future. No other animal has this capacity according to the following study.

People can time-travel cognitively because they can remember events having occurred at particular times in the past (episodic memory) [ED: e.g., the sense of when] and because they can anticipate new events occurring at particular times in the future. The ability to assign points in time to events arises from the human development of a sense of time. [In this paper] the hypothesis is advanced that animals are cognitively stuck in time; that is, they have no sense of time and thus have no episodic memory or ability to anticipate long-range future events. Research on animals' abilities to detect time of day, track short time intervals, remember the order of a sequence of events, and anticipate future events are considered, and it is concluded that the stuck-in-time hypothesis is largely supported by the current evidence.

Roberts, William. *Are Animals Stuck in Time?*

Psychological Bulletin 2002, Vol. 128, No. 3, 473–489. American Psychological Association. 2002.

[https://www.msu.edu/course/psy/962/snapshot.afs/Roberts%20\(2002\)%20-%20Are%20animals%20stuck%20in%20time_epidodic%20memory.pdf](https://www.msu.edu/course/psy/962/snapshot.afs/Roberts%20(2002)%20-%20Are%20animals%20stuck%20in%20time_epidodic%20memory.pdf)

In the modern world, we take time for granted what with watches and clocks everywhere and even time stamps on receipts, but to early humans, linear time was quite magical, mysterious and fearsome.

"It must have required enormous effort for man to overcome his natural tendency to live like the animals in a continual present."

Gerald James Whitrow.

Time in History: Views of Time from Prehistory to the Present Day.

Oxford, UK, Oxford University Press. 1988

For a language to be considered fully developed a basic vocabulary that could express time concepts was essential. So during the same period that an early fully developed language was born, time concepts also came into being.

"Time reference is a universal property of language..."

Jacqueline Lecarme, Ph.D., Linguistics

The basic and universal time words, known as Semantic Primitives, as listed by the Natural Semantic Metalanguage originated by Anna Wierzbicka, suggests the essential words and concepts that the earliest languages may have used. She chose these words because they can be translated into any known language and are understood in all languages.

What Is NSM?

<https://intranet.secure.griffith.edu.au/schools-departments/natural-semantic-metalanguage/what-is-nsm>

UNIVERSAL WORDS FOR TIME IN ALL LANGUAGES:
when/time, now, before, after, a long time, a short
time, for some time, moment

A Fully Developed Language By 100 Kya

Recent archaeological evidence now points to the start of a fully developed language at about 100 kya.

This is the date of the oldest undisputed Homo sapiens burial and also the date of a 'paint kit' which was probably used for ceremonial purposes but in any case, was carefully put together with considerable forethought.

100 kya – The oldest known ritual burial of modern humans was at Qafzeh in Israel. It was a double burial of what is thought to be a mother and child. The bones have been stained with red ochre.

https://en.wikipedia.org/wiki/Paleolithic_religion

Also 100 kya –

The first confirmed burial also coincides with the first confirmed paint kit found at the archaeological site of Blombos Cave in South Africa. This find indicates the beginning of symbolic thought either as body paint or paintings.

The hoard includes red and yellow pigments, shell containers, and the grinding cobbles and bone spatulas to work up a paste - everything an ancient artist might need in their workshop.

"There is a view that this behaviour is linked with complex language. So, it may indicate these people were communicating in a fully modern way," said Prof. Chris Stringer from London's Natural History Museum.

Amos, Jonathan. *Ancient 'Paint Factory' Unearthed*. BBC News. 2011.

<https://www.bbc.com/news/science-environment-15257259>



Middle Paleolithic shells with drilled holes. It is assumed these were early beads.

The five key elements 'jelled together' when they reached a critical point about 100 kya.

"The similarity of cognitive processes and cortical networks involved in speech and tool use suggests that these behaviours are best seen as special cases in the more general domain of complex, goal-oriented action. This is exactly what would be predicted by hypotheses that posit specific co-evolutionary relationships between language and tool use..."

Stout, Dietrich, and Thierry Chaminade. *Stone tools, language and the brain in human evolution*. Philosophical transactions of the Royal Society of London. Series B, Biological sciences vol. 367,1585 (2012): 75-87. doi:10.1098/rstb.2011.0099
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3223784/>

These findings satisfy many of the criteria outlined by Constance Holden's article, No Last Word on Language Origins, quoted at the beginning of this blog-post. She wrote that anthropologists believe that a full language first happened when there was evidence of, "tools, burials, living sites, and occasional hints of art and personal adornment reveal[ing] beings capable of planning and foresight..."

But this still leaves the nagging question of why the 'Upper Paleolithic explosion' did not happen for another 60,000 years.



Why Was There A 60,000 Year Gap Between The Start Of A Fully Developed Language And The Upper Paleolithic Cultural Explosion?

Making the switch from living in the moment to living with a sense of time was a momentous change. A person would realize that their death was inevitable along with that of their mate and their children, for example. They could now imagine that terrible events which had occurred in the past might be repeated in the future -- such as floods, disease, invasions, fires, starvation, earthquakes and volcanoes. And along with this new understanding of time came the new emotions of worry and hope. While a belief in time as a linear continuum gave humans great power, it also gave them great anxiety. Cultures would have to find ways to cope with these fears which were usually dealt with through religious rituals -- or, we might say, religious processes.



This ornament (left) is one of two at the entrance gate (right) for the 200 year-old Oudewater Reformed Cemetery in Holland. This cast-iron funerary art expresses the universal angst and dread about linear time and the inevitability of death. This fear was as true then as it was to Paleolithic Homo sapiens 100 kya. The hour glass in the middle is a symbol for the passage of time and the wings represent "time flies" or in Latin "tempus fugit."

For Paleolithic peoples, this new sense of time was a 'brave new world.' It must have been a bit like Alice in Wonderland. It signaled the beginnings of consciousness, for example, and probably belief systems that involved animism, totemism, and magic.

It is very important to not see these beliefs as 'primitive' or backward, but instead to see them as functional for the people at the time and for the environment they lived in. A hunter-gatherer way of life had entirely different demands from neolithic farming which was entirely different from a complex civilization.

As Jacques Cauvin has said, religion came first before technological advances. He suggested that a belief system had to be in place before the building of civilizations, for example, because a culture first needed to reflect the beliefs of the people. The belief system came first and was fundamental because it gave the culture its *raison d'être*.

See my blog about Cauvin's ideas:

The Mystery of Gobekli Tepe: The World's Oldest Temple

<https://deconstructingtime.blogspot.com/2019/05/the-mystery-of-gobekli-tepe-temple.html>

In other words, rather than religion reflecting and emerging from the new technology and way of life, as previously thought, religion came first. The culture and the technology instead reflected the religious beliefs that were already in place. However, it is likely that once cultures and civilizations were established, they, in turn, modified the existing religion.

So the reason for the Paleolithic 'language and culture gap' was that Paleolithic people had to become comfortable with their belief system before they could create symbols, art, tools and social activities that reflected that their beliefs.

I would suggest that when linear time, in general, had become part of the human way of life, the Paleolithic system of processes was extended to religion. Religious rituals were derived from an understanding of processes, and so became processes themselves. They were designed to bring favorable outcomes in the future and to retain favor with natural and supernatural forces. And once these religious processes were in place, the stage was set for the Upper Paleolithic explosion.

Then once a belief system was in place and people finally felt comfortable with their newly expanded understanding of time, they used the tremendous power that it gave them to plan, to organize, and to build, which led to the Upper Paleolithic cultural explosion and then to farming and eventually to civilization.

AFTERWORD

Examples Of Two Advanced Processes That Were Being Used Before The Upper Paleolithic Cultural Explosion

Here are two examples of processes which occurred during this gap. They show how sophisticated the Paleolithic technology had become yet these were done during the time before the Upper Paleolithic explosion of creativity. It seems very likely that language must have developed by this time in order to execute these processes and to instruct others in the procedures. In my next blog, I will go into more detail about how an understanding of time and an understanding of processes were closely related.

The Heat Treatment Of Silcrete For Stone Tools

Approx 70 kya for the advanced process

About 130 kya Paleolithic people learned to heat treat certain kinds of locally available stones. Instead of needing to use flint, for example, they, in a sense, made their own "artificial flint" by treating silcrete so that it had flint-like properties, which made it an excellent material for tools and arrows. The heat treatment made the stone harder, less prone to fracturing and easier to shape. Over perhaps 60 ky into the Middle Paleolithic era (the time before the Upper Paleolithic explosion), this technique became quite sophisticated.

Beginning with an above-ground method of placing stones in a pile of embers, it evolved into a well crafted controlled method that used "underground heating in an earth-oven like fire-pit. (sciencedaily.com -- see reference next)" This is a good example of the evolution of a Paleolithic process and the increasing complexity, precision, and sophistication that was achieved.

The "silcrete heat treatment...may provide the first direct evidence of the intentional and extensive use of fire applied to a whole lithic chain of production...This heating

process marks the emergence of fire engineering as a response to a variety of needs that largely transcend hominin basic subsistence requirements."

University of Bergen. *Early humans used innovative heating techniques to make stone blades.* ScienceDaily. ScienceDaily, 20 October 2016.

<http://www.sciencedaily.com/releases/2016/10/161020092107.htm>



71 kya silcrete stone tools

Stolarczyk, Regine; Schmidt, Patrick. *Is early silcrete heat treatment a new behavioural proxy in the Middle Stone Age?* 2018.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0204705>

Bicho, Nuno, Editor. *Early Evidence for the Extensive Heat Treatment of Silcrete in the Howiesons Poort at Klipdrift Shelter (Layer PBD, 65 ka), South Africa.* 2016.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5070848/>

Schmidt, Patrick; Sanchez, Océane; Kind, Claus-Joachim. *Stone heat treatment in the Early Mesolithic of southwestern Germany: Interpretation and identification.* 2017.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0188576#sec001>

Detailed Example Of A Late Middle Paleolithic Process For The Construction Of A Bow And Arrows

About 60 kya

Using archaeological finds and ethnological parallels, the two researchers reconstructed the steps needed to make a bow and arrows. These are complimentary tools -- separate, but developed interdependently. The bow is the controlling element, while the arrows can be used more flexibly and are interchangeable. About 2.5 million years ago, humans first used tools to make other tools then to make tools assembled from different parts to make a unit with

particular qualities, such as wooden spears with stone spearheads (ca. 200,000-300,000 years ago.) The bow and arrow and other complementary tool sets made it possible for prehistoric humans to greatly increase the flexibility of their reactions. There are many basic complementary tool sets: needle and thread, fishing rod and line, hammer and chisel. The bow and arrow are a particularly complex example. The reconstruction of the technique shows that no less than ten different tools are needed to manufacture a simple bow and arrows with foreshafts. It takes 22 raw materials and three semi-finished goods (binding materials, multi-component glue) and five production phases to make a bow, and further steps to make the arrows to go with it. The study was able to show a high level of complexity in the use of tools at an early stage in the history of Homo sapiens.

Universitaet Tübingen. *Complex thinking behind the bow and arrow*. ScienceDaily. ScienceDaily, 25 June 2012.

<http://www.sciencedaily.com/releases/2012/06/120625064620.htm>