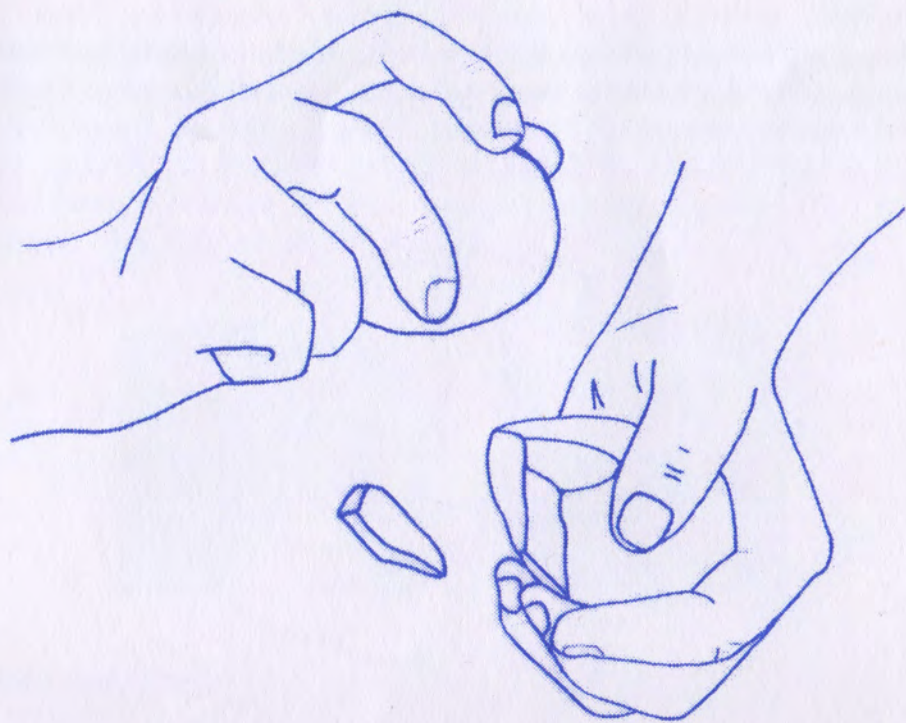


SIMPLE TOOLS MAKE THE TASK EASIER



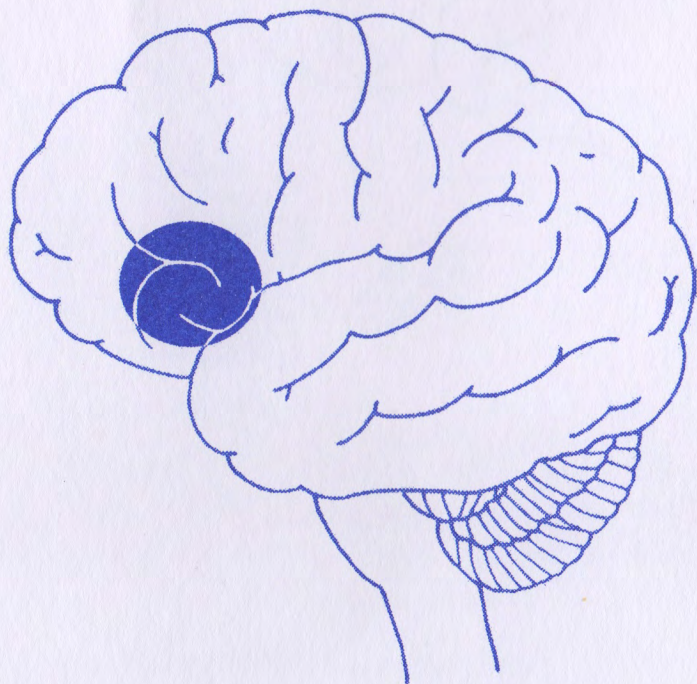
by **Amelia Crouch**
with photographs from Cliffe Castle Museum, Keighley

SIMPLE TOOLS MAKE THE TASK EASIER

by Amelia Crouch with photographs from Cliffe Castle Museum, Keighley.

VERBAL MANIPULATIONS: In a display at the British Museum a double-edged sword and a battle axe are exhibited together in the same case. Two tools and two turns of phrase.

I came across these items a year or so ago whilst browsing absentmindedly and don't remember the purpose of the display. I am sure what linked these co-housed objects was that they both came from a particular time or particular place, yet I like to imagine the museum curators having a chuckle at the double-meanings of their names.

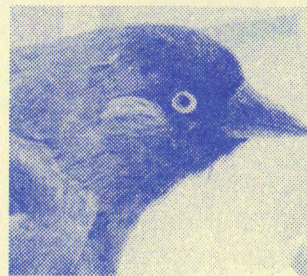


SIMPLE TOOLS: Tool use is often considered to be a skill that marks our difference from other species, providing evidence of our higher cognitive capacities.

'The ability to use tools is a distinguishing feature of human beings.'
(Baber 2003)

In fact tool use has been observed in other animals (including elephants, otters and octopuses) but it appears to be largely instinctive and inflexible – rote forms of behaviour that are not adapted or modified to be applied effectively in different situations.

Candidates for more complex tool use are primates such as chimpanzees – who use moss and leaves like a sponge to gather water; stones to crack open nuts and shellfish; or sticks to collect ants – and corvids (crows, ravens and rooks), who also use sticks to manufacture tools to 'fish' for larva. These animals adapt and modify behaviour seemingly working out new solutions to new problems. (Wikipedia 2017)



TOOL TYPES:

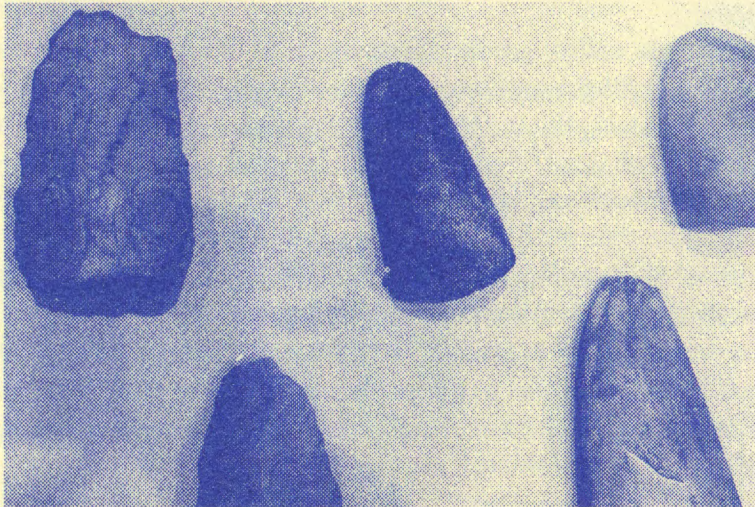
NATUREFACT: found, not manipulated

ARTEFACT: crafted/alterd

META TOOL: tool used to act on another tool

A stick is a 'naturefact' a chewed stick is an 'artefact'

STICKS & STONES & BROKEN BONES: We might suppose that early humans fashioned stick tools however sticks don't weather well in the archaeological record. The usual evidence given for the development of tool use is stone 'choppers' and hand axes.



The earliest Palaeolithic era hand axes go back 2.6 million years and look simply like stones to the untrained eye. Palaeoanthropologist Thomas Wynn writes: 'It was probably very ad hoc,' when you needed a stone tool and didn't have one you 'just made one, then dropped it' (cited in Choi 2009).

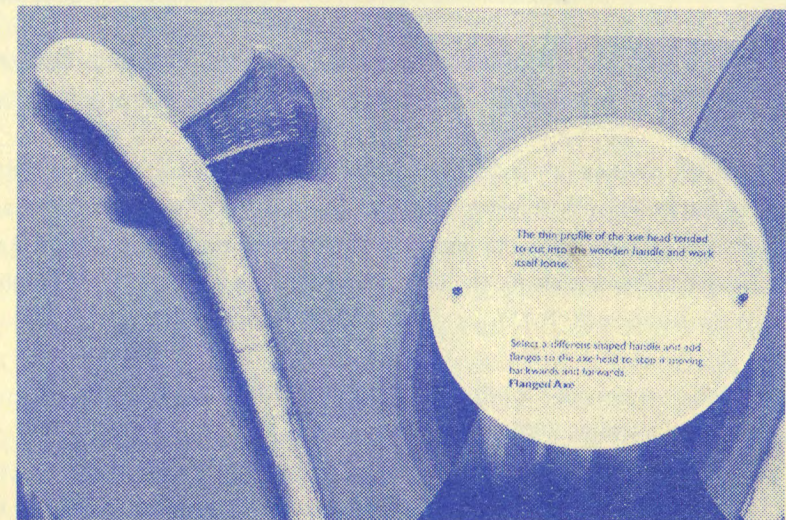
These tools were refined over time to become more symmetrical and sharp. The most well-known teardrop shape — created by striking together hard stones — predominated between 1.76 million and 150,000 years ago, coinciding with the oldest known butchered animal bones. This suggests the axes were used for butchering animals, though McGreggor asserts this was one use amongst many when he calls them the 'Swiss army knife,' of their day (McGreggor 2010). The pointed end could be used to drill holes and the sharp sides to cut trees and scrape bark as well as meat and skin.

If you start looking, you'll see hand axes in museums all over the place. My own local museum Cliffe Castle in Keighley has examples both in their Egyptian collection and in an Archaeology display including axes found with tens of flint tools on Ilkley moor. It seems the hand axe was an international

device. As long as the material resources were available the same kind of solution for pounding and cutting was fashioned in different situations all across the world.

Gradually hand axes became more sophisticated as variations developed with a shaft and a hole for a handle to be attached and Homo erectus began to hang on to their tools. Jump ahead several thousand years to the discovery of metal-working (first bronze and then iron from 5 or 6,000 years ago) and the shape, design and efficiency of tools changed again.

THE CUTTING EDGE: The curators at Cliffe Castle must like a pun as much as those at the British Museum. The information panel accompanying a display of arrowheads is entitled 'Making a Point,' another outlining the shift to settled farming populations from hunting and gathering is 'Clearing the Way.' A description of how material properties and the development of metalwork influenced early tool design is headed 'At The Cutting Edge.'



Adjacent to this latter panel an object display shows a variety of flat axes each solving a particular 'problem' with a new material or practical 'solution'. Tools are not born fully formed; as the overview panel says: 'The design of bronze axes developed as a result of solutions to problems experienced by those using them.'



WHAT MAKES A TOOL? *Hitting, Cutting, Gripping, Holding, Rubbing, Shielding, Moulding, Spreading, Testing.*

'The external employment of an unattached or manipulable attached environmental object to alter more efficiently the form, position, or condition of another object, another organism, or the user itself, when the user holds and directly manipulates the tool during or prior to use and is responsible for the proper and effective orientation of the tool.'
(Shumaker, Walkup and Beck, 2011)

'An object carried or maintained for future use'
(Finn, Tregenza, and Norman, 2009)

'The use of physical objects other than the animal's own body or appendages as a means to extend the physical influence realized by the animal'
(Jones and Kamil, 1973)

'An inanimate object that one uses or modifies in some way to cause a change in the environment, thereby facilitating one's achievement of a target goal'.
(Hauser, 2000)

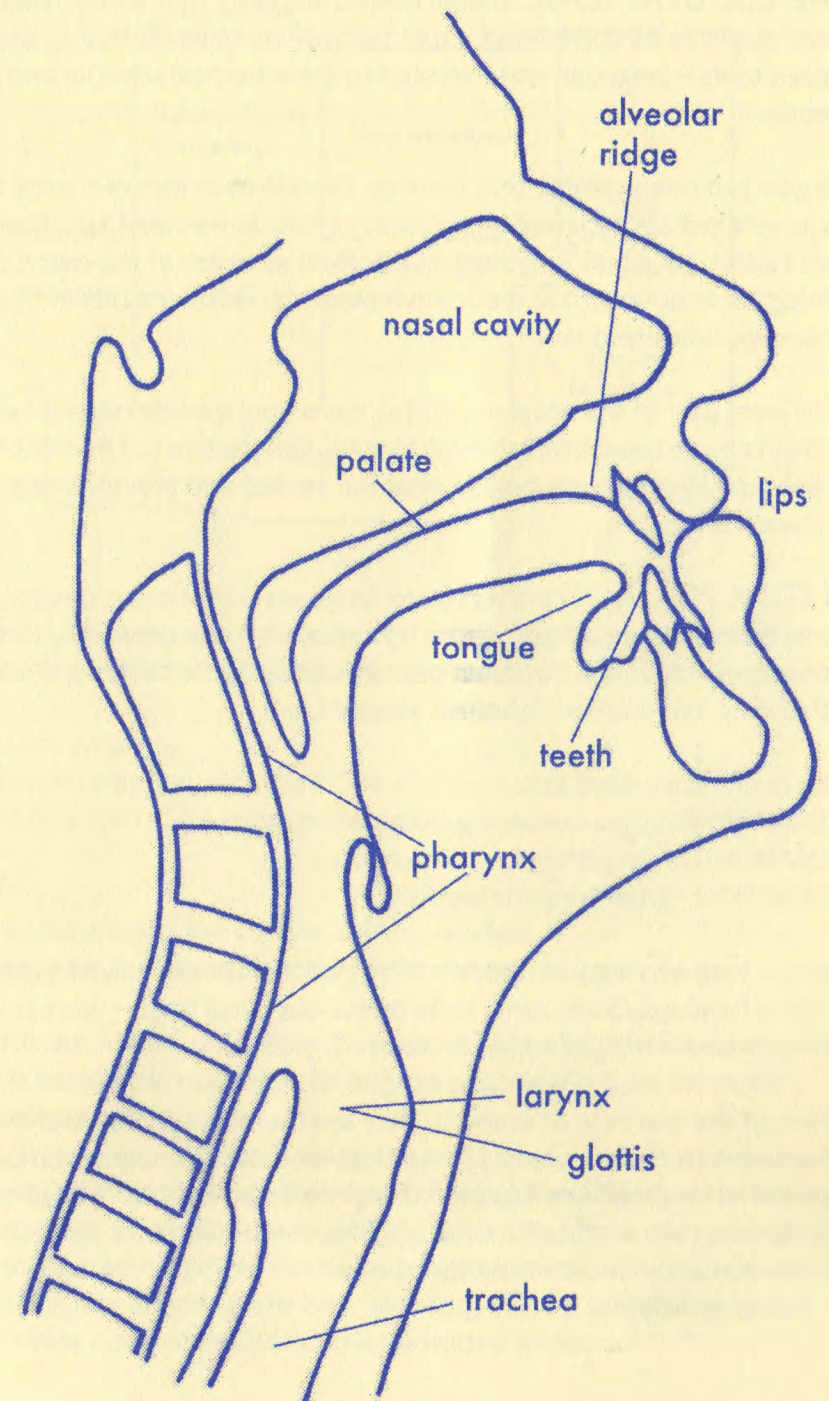
Deciding what constitutes a tool is not an easy task. Above are some possible definitions all culled from Wikipedia (2017). Note their emphasis on physical, manipulable objects. It's a common sense kind of idea of the tool derived perhaps from the historical development of objects like hand axes.

In *Objectivity: A designers book of curious tools* David Usborne categorises tools along the lines of what they physically do. The first tools were hitting tools, followed by cutting, gripping ('helping the user to manipulate things that are too small, cold, slippery, inaccessible or hot to handle.') and later – as communities became settled – for holding and rubbing. His categorisations focus on physical properties but shift attention to processes rather than objects.

Cliffe Castle has its own selection of 'curious tools' in a current, temporary display. Visitors are confronted with a range of items and asked: 'What is it?' Unusual looking objects serve purpose from stretching hats to snuffing out candles and 'correcting' deformed cattle horns. The difficulty in identifying what they are stems no doubt from them having functions that are unfamiliar or now defunct. Some tools are universal but others change or become redundant in particular times and places.

Today, I wonder, is a physical understanding of tools sufficient in our contemporary world? Couldn't Wikipedia be considered a tool too? Perhaps even a paradigmatic tool of our age. The final definition above – with its shift to 'goals' – is more akin to that given by McCarty and McQuaid who say: 'The word "tool" describes virtually anything that aids us in accomplishing a task' (2014 p.10). They assert that later tools tend to build on earlier ones in terms of what they want to accomplish but may differ quite a lot materially or in complexity, such as in the case of the relationship between a pencil and a typewriter.

Wikipedia is a tool that depends on multiple others – components and systems for computing and the invention of the World Wide Web. It is evolved from a printed encyclopaedia which itself relies on the invention of printing press, the book format, paper, writing, the alphabet and verbal language.



THE CULTURAL TOOL: Daniel Everett suggests that verbal language itself ought to be considered a tool because he believes that – like object based tools – language was invented to solve particular social and survival needs.

To give just one example that he uses; Everett describes our vocal tract as 'a jury-rigged collection of anatomical parts that we need for other things' (2013 p.172). He posits language as a bolt-on emerges at the nexus of our biological endowment and our environmental existence rather than a skill that is genetically innate.

'[E]very part of the vocal apparatus has a non-speech-related function that is more basic from an evolutionary perspective [...] In order to produce language we exploit what our bodies and brains already have.'
(Everett 2013 p.173)

A TOOL FOR...: Of course, calling language a tool raises questions as to its purpose. Remarkably, given how much we rely on words, there's no consensus. Language sits as an object in Cliffe Castle's temporary *What is it?* display, but with no definitive answer label.

The main contenders are:

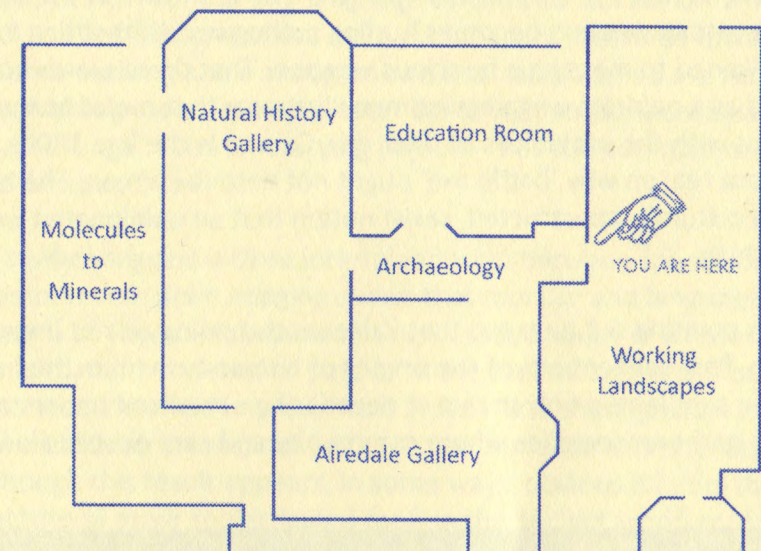
COMMUNICATION - conveying information

COMMUNITY - grooming/phatic purposes

COGNITION - organising the world

Rather than serving just one function, perhaps these evolved together and – like a hand axe/Swiss army knife or like our vocal tract – there is not just one primary role (Trask & Mayblin 2009).

Think of the words in a museum; they are there to educate and inform; they serve to classify objects (a typology of tools or a segmentation into natural history/archaeology etc.). They must also be interesting enough to captivate us like the playful titles at Cliffe Castle which are somewhat akin to the phatic function – used to draw us in.



DOUBLE BACK: I want to return, briefly, to the words I began with. Two objects labelled with dual meanings that initiated my train of thinking.

Double-edged sword:

- a) a long bladed weapon with the blade sharpened on both sides
- b) a course of action or situation with both positive and negative aspects

Battle axe:

- a) a large broad-bladed axe used in ancient warfare
- b) a domineering and forceful woman with strong opinions

These words did more than simply draw me in. Why they struck me in particular is because brute, material objects provide the basis for more abstract conceptualisations.

In their study of metaphor Lakoff and Johnson (2003) explain that the usual direction of travel in metaphorical thinking is (as here) from concrete referents to abstract target domains. In the above particular instance, the meaning of double-edged sword isn't hard to grasp. An underlying spatial metaphor maps a two-sided blade to a two-sided situation.

Battle axes, to take the second example, were once thrown in warfare. Hurling a cutting weapon becomes hurling cutting words; meeting a strong woman likened to meeting a ferocious weapon. That these words are gendered as a pejorative against women illustrates that metaphors are consonant with the prejudices of their day. Coined in the late 1800s, I see no inherent reason why 'battle axe' ought not describe a man. The term reflects a culturally constructed, sexist notion that an opinionated woman is a bad thing.

It's worth pointing out here too that Palaeoanthropology is not immune to sexism. Past conceptions of the origins of humanity in 'man the hunter' have been supplanted only in recent decades by a nuanced understanding of hunter-gatherer societies where community and care existed alongside conflict.



MIND AND HAND:

'[T]ools and signs are not separate things' (Burkitt 1999 p.40)

Unlike bones or stone tools, spoken language doesn't fossilise. Attempts to date its origins range widely from as late as 50,000 years ago to as early as the beginning of the human genus more than 2 million years ago. Researchers rely on archaeological evidence of the evolution of the vocal tract and on proxy indicators. As Michael Balter asks: 'Does painting cave walls indicate the capacity for language? How about the ability to make a fancy tool?' (Balter 2013)

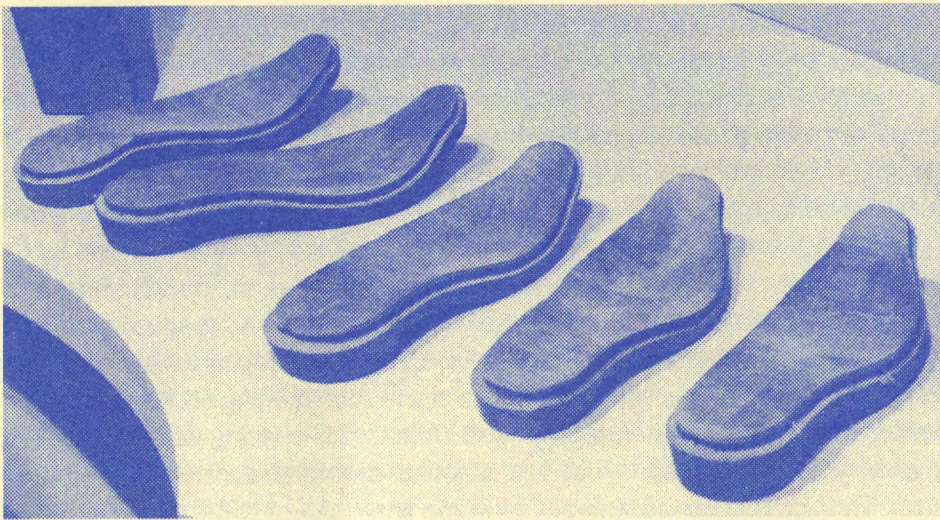
One thesis is that tool-use and language co-evolved. Ian Burkitt writes that tool use 'formed one of the main evolutionary pressures towards bipedalism – walking and running on two legs' (Burkitt 1999 p.39). Hands, freed for holding tools develop greater dexterity themselves whilst the mouth – no longer used for carrying objects – has the potential to be adapted for speech.

Recent studies suggest a close interrelationship between speech and tool-manipulation. Brain imaging shows that tool use and language utilise similar parts of the brain (Balter 2013; Otis, L. 2016). A study in which students were taught and then asked to pass on stone tool-making techniques demonstrated a marked improvement in their skill-sharing when permitted to give verbal descriptions, not just practical demonstrations (Balter 2015). Though this result appears, in some ways, obvious it infers that manufacture of more sophisticated tools in the ancient world could have been stunted without supporting words. Tools enable words, which in turn enable tools.

SIMPLE TOOLS MAKE US HUMAN: Cognitive and linguistic capacities are formed through physical interaction with the material world. It is perhaps not surprising therefore that language is permeated with material and spatial metaphors.

Though there is no decisive evidence as to the origins of language, the mutuality between words and physical tools indicates a kind of feedback loop between material, social and symbolic practices and biological and cognitive evolution. Until the 1960s palaeoanthropologists believed that using tools was an outcome of human evolution but the discovery of tool use in pre-human primates reversed this view. Tools are seen not as an outcome of human evolution, but a cause. (Burkitt 1999 p.40)

In this picture it is not tool use as such that defines us as human, and humans are not fundamentally different from other animals. Instead tools played a part in setting early hominids on a path to develop bodies, minds, social configurations and cultures that we recognise as human today.



LAST WORDS: The title of this booklet is taken from a short film *Old English Crafts* (1942), on display at Cliffe Castle, which documents a dying local clog making trade. A craftsman makes clog-irons as a narrator successively celebrates the efficiency of his innovative tool adaptations and laments how too much efficiency and automation is killing off the craft... Simple tools may 'make the task easier' but more complex tools threaten the human hand.

Since the invention of the hand axe tools have evolved through the bronze age, iron age and industrial age to our present moment of electronic innovation. Tools first formed as recognisable extensions of our physical selves are increasingly complex; miniaturised, abstracted and removed from direct human muscle power. Like the phrase 'double edged sword' – which needs no actual sword to sustain its meaning – many tools need no bodies to accomplish their tasks.

What are the implications of technological innovations on future bodies and minds? Notwithstanding an apocalyptic end to the human race, will tool evolution lead us to become something other than human? I think that probably there is no predetermined answer. Much will depend on how we (present and future generations) use available resources and the outcome may have a lot to do with what we are able envision. What are the metaphors of self and society that we will use to frame the future?

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