

TECHNIQUES OF THE BODY REQUIRE TOOLS ANYWAY

According to an old but recurrent theory, human tools originated as extensions of the human limbs and organs. Hence the name *Organprojektion* which was coined for this theory by one of its first proponents, the German philosopher Ernst Kapp (*Grundlinien einer Philosophie der Technik*, 1877).

At a first glance, Kapp's theory looks quite plausible. It appears as a logical development of Darwin's theory of evolution. And it is supported by the numerous examples we know today of tool use among animals. For notwithstanding a few exceptions, the most famous being the chimpanzees, animals do not make tools. They just select natural objects which happen to fit into some of their patterns of action. Such objects have been called *naturefacts* by Wendell H. Oswalt (1976), by contrast with *artefacts*, which are not only found and selected, but made; naturefacts are also quite well documented among humans. In an evolutionary perspective, therefore, it looks quite reasonable to argue that the first representative of the genus *Homo* also began by selecting naturefacts that happened to fit into this or that pattern of action. With time, the habit of using naturefacts would gradually extend to more and more patterns of action, and the naturefacts themselves would be progressively modified to make them more convenient to use, until they became real artefacts. Finally, even the most complex implements and machines can be seen as resulting from the same process of extension starting from the body. Telescopes are aid for the eyes, telephones for the voice, cars and planes are substitutes for the backs and legs of porters, etc.

As I see it, there are two problems with that theory. First, it is too general : it explains everything, but in a way that does not lead to specific and testable hypotheses. Second, it overlooks what I believe to be a crucial difference between tools, according to whether they are indispensable for efficient action, or not. For instance, shoes are a protection for the feet and an aid for walking, especially on difficult circumstances, but they are not indispensable to it : we are able to walk without shoes, even if we find it uncomfortable or even painful, and until a few centuries ago, most peoples in most countries of the earth used to walk barefoot most of the time. There are even a number of examples of people taking off their shoes, either to spare them or in order to walk more freely. Conversely, we are absolutely unable to fell a

tree with our bare hands and teeth (as beavers do); for this kind of action, we need cutting tools of a minimal efficiency, of stone or metal, which are the outcome of a long series of successive inventions. So, cutting tools are not only an aid for action, they make the action possible. And they make it possible precisely because they work in a way that our teeth or fingernails cannot. In that sense, a billhook or an axe can be said to be *necessary* for cutting wood, whereas a pair of shoes are only *auxiliary* for walking – even if for cultural reasons, most people cannot think of walking barefoot in ordinary circumstances today.

I believe that this difference between necessary and auxiliary tools is crucial, because it leads to another difference, no less important, in the process of tool development. Auxiliary tools are contrived as means to improve patterns of action that already exist, whereas necessary tools are means to contrive novel patterns of action. Walking did exist for ages before protective devices for the feet were thought of, whereas felling trees could not be thought of before minimally efficient cutting tools had become available. In the first case, *in the evolutionary response* action precedes tool, in the second, tool precedes action.

reflections Granted, the difference is not always as clear as that, especially when it comes to less simple tools. And I would admit that in the course of humankind's technological development, the difference becomes less and less relevant, to the point of being of little or no use in our present-day industrial or post-industrial societies. Obviously, it does not make much sense to ask whether cars, planes, television sets and computers are auxiliary or necessary appliances. But here, we are dealing with "simple" tools, even if we are unable to draw a sharp line between simple and not-so-simple tools. The hard fact remains that a knife does not work anything like human teeth or fingernails, neither do hammers, rasps, awls, adzes, etc. All those tools have their own ways of working, making them prerequisites for patterns of action which could not exist without or before them : in that sense, they may be called *true* tools. By contrast, auxiliary tools may be said to be *prostheses-like* tools, because they do not fundamentally change the way our bare hands, feet, or teeth are working.

It must be clear by now that the *Organprojektion* theory only applies to auxiliary or prostheses-like tools, if it applies at all. Wooden pliers used in Asturias (Spain) to gather chestnuts without pricking one's fingers are a pretty good example. The tool itself is very simple - a stick, 70 cm long, flattened along its length and bent in the middle – and it works exactly like two opposite fingers. Chopsticks work about the same way, only their manipulation requires more skill. Other examples are a pair of half-scoops used in ancient Egypt for the winnowing of grain (they work exactly like two hands joined together) or the harvesting thimble used in some Indonesian isles (a small bamboo or iron cylinder put onto

one's finger to be used as a kind of artificial fingernail). Serious research would certainly yield many more examples. But my point here is only to provide an idea of what prostheses-like tools are like according to the available ethnographic evidence. Now, if the *Organprojektion* theory has any validity, such tools must represent the most primitive part of our tool-kit. They, or their like, must have been present at the very beginning of mankind. True tools only came later, as they were only modifications of prostheses-like tools.

One problem with this theory is that the available evidence, for and against it, is very scarce. Practically all evidence we have on prostheses-like tools is ethnographic, that is less than two or three centuries old at most. East Asian chopsticks are older; I was unable to find out solid data on their chronology and geography, but it would be very rash to assume that they ~~could be~~ ^{are} more than 2000 or 3000 years old, which is still insignificant by prehistoric standards. Obviously, no serious attempt can be made to apply such recent evidence to developments that are supposed to have occurred hundreds of thousands of years ago.

Research on free-living primates has now accumulated a lot of evidence of every kind. Yet, from the *Organprojektion* theory point of view, this evidence is ambiguous at best. Among the tools used by chimpanzees, the most famous are sticks for fishing termites and percutors for breaking open nuts : according to our definition, both are involved in patterns of action that would be impossible without them, so they are true tools. I have not attempted to analyse in detail the mass of the evidence beyond that, but I am very much in doubt whether it would be supportive of the theory. The less so since primates, including chimpanzees, do not seem to be really fond of using tools. Gorillas, orang outans and bonobos very rarely use tools, although they are said to be clever enough, and more or less as clever as chimpanzees in that respect. Even among chimpanzees, the females and the young seem to use tools more readily than the dominant males, who prefer to engage in more socially-rewarding pursuits. My inference is that tool use is not a matter of being more or less intelligent, at least not when you happen to be an ape. It is a matter of need. Using a tool must be learnt, and requires time, effort and patience, if nothing else. So, an ape will not choose to use a tool, if it has not a compelling motive to do so. And mere convenience is not compelling enough. Only necessary tools are worth the trouble of looking for them, of making them, of training to use them, etc. Now, there is no reason why this reasoning should not be applied to early humans. For them as for apes, tools had to be necessary, or they would not have been worth the trouble.

But there is still one more kind of tools to be considered. Since Mauss's seminal paper on the "*Techniques du corps*" (1936), the idea of tool-less techniques has been widely accepted. But it all depends on our definition of what a tool is. Let me take an example again.

And Egyptian windows
Lull. - chips are certainly less
than 4000 years old

Using one's hand for grasping is natural – so natural indeed that the behaviour is present in the newborn child. Using one's hand, closed into a fist, for hitting at something or at somebody is not natural in the same way. It is not present in the child, although I do not know of any study on that subject. It does not seem to have been recorded among apes. And in pre-contemporary human societies, the evidence is scarce and circumstantial. A nice example is to be found in *The Two Drovers* (1827), a short novel where Walter Scott tells the story of a Scotchman who took as a deadly offence the challenge from an English friend to fight bare-fisted. This affaire d'honneur, which is supposed to have happened somewhere in the 17th century, does not allow for definite conclusions. I only use it to illustrate the point I am trying to make, namely that among humans, the use of the fists for hitting cannot be taken for granted.

I would suggest that the grasping hand is used *organ-like*, whereas the hitting fist is used *tool-like*. Which means that the fist is handled as would be a tool (stone or club) held in the closed hand, except that the tool is missing. My contention is that the practice of using one's fist tool-like could only be acquired after the habit of hitting with a real tool had become common practice. Contrary to the *Organprojektion* theory, the club is not an extension of the arm, but the fist is an incorporation of a club, so to speak. Or to put it otherwise, the fist is a part of the body used after the model of a tool.

This kind of reasoning would have to be tested against the facts, the problem being of course to find categories of facts sufficiently documented. Swimming may be a somewhat better example in that respect. For the ^{terms of the problem} question is exactly the same. Swimming does not seem natural among primates, as it is among many quadrupeds. So it is not improbable that in humans, the use of floating objects was a prerequisite for the learning of swimming proper. In swimming, like in boxing, the body (or parts of it) is used too-like, which presupposes the use of real tools in acquiring the new pattern of action.

The process of turning some parts of the body into tools may be called *self-domestication*. Self-domestication proceeds at two levels, one socio-historical, the other individual, since each child has to learn to domesticate his or her body according to the requirements of the society into which he or she has been born. I cannot and I shall not discuss these aspects here. What I want to add is that if using parts of the body tool-like came second, the use of prostheses-like tools must have been third and last. For the idea that objects may be used as prostheses, that is, as extensions of the limbs, presupposes the idea that the limbs themselves are somehow tool-like. Thus, the sequence would be :

1°, necessary or true tools;

2°, treating parts of the body tool-like (self-domestication); and

3°, auxiliary or prostheses-like tools.

If any tools can be described as extensions of our limbs, they must have been the very last to be included into our tool-kit.

I am aware of course that this theory is still too abstract, nearly as abstract perhaps as the *Organprojektion* theory it is intended to replace. But I think it offers more opportunities to be completed and improved. One drawback of the *Organprojektion* theory is that it postulates among the early hominids the very trend to use tools which has to be explained in the first place - if such a trend exists. Any alternative theory has to find a way out of that circle. I have no ready-made solution myself. I can only make a few more suggestions.

First, tools have to be made. Naturefacts are selected only, but it is a question whether a natural object can be interpreted as a possible tool without some real tool, man-made, being available as a model for recognizing it as such. That consideration adds to the argument I have proposed about learning. Tool use requires learning, that is some degree of attention, effort and patience; it also requires, first of all, that a tool be available nearby, or at least a natural object fit for use as a tool. Those are not easy conditions to meet, but they must have been met somehow, and they are met, typically, in the breaking open of nuts practised by chimpanzees of West Africa. The crucial importance of this pattern of action had been perfectly understood by general Pitt Rivers as early as 1868. It is something of a paradox that Pitt Rivers' ideas on that matter have been allowed to fall into complete oblivion, until they were rediscovered, independently, in the 1970s, more than one century later.

My second and last point concerns the use of prosthesis-like tools, and beyond that, the use of human limbs themselves as tools. I have already argued that prosthesis-like tools must be more recent than true tools. I would like to add now that a similar difference is perhaps to be made between patterns of uses of the human body itself.

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I did not mention before