

TOOLS AND TECHNOLOGY

Dancing with Tools



Brigitte Jordan



How Technologies Have Shaped Society and Vice Versa

Introduction: Tapping into the Past



Andes stone chips Photo courtesy Brigitte Jordan

We have been in bed with tools from the beginning. Every societal advance that we can trace or imagine has involved an intimate interplay between tools and social formations in the making. Now, at a time when the world is crying out for tools that help manage the uncertainties of globalization, automation and the digital revolution, we should consider what we can learn from the millions of years our ancestors have been engaged in making (and living with) tools not only for making things, but also for making sense of the world. I would suggest that the mutually defining relationship between humans and the extrasomatic aides we use to understand and construct our environment began long before the appearance of stone tools about 2.6 mya (million years ago). It is likely that the curious, exploratory, playful, intimate interaction with the material environment typical for our species began to co-evolve with the transformation of front paws into hands a very, very long time ago. This might have happened as early as five or six million years ago when we can assume that upright posture and bipedal locomotion emerged, for which hands and evolving tools would themselves have been driving forces.

Tools “Slowly Burst upon the Scene”

Functional hands are demonstrable by 4.4 mya with [Ardipithecus ramidus](#) and probably were present long before that. So it is likely that the earliest objects with tool-like functions appeared soon after our ancestors achieved upright posture, long before the earliest hard evidence for the use of stone tools, a [bone with definite cut marks](#), about 2.6 mya.

We have no direct evidence for what these early technologies were like since they were eminently perishable. But we know that they must have existed before stone tools because the earliest stone tools are associated with social transformations that must have developed over long periods of time. Archeologists have found debris numbering in the hundreds in tool production workshops that indicate long distance procurement of raw material, mental maps and thus planning, social collaboration and thus a developed social life the antecedents of which are no longer recoverable, at least with current technologies. These findings imply creatures who were capable of intentional, systematic, rule-following design and fabrication of artifacts, and a societal reorganization that involved not only shifts in behavior patterns but also significant neural reorganization underlying increasingly sophisticated harnessing of experimental tools into social technologies.

Looking back, it appears that our ancestors' activities generated a socio-material ecology of pseudo-tools (tools-in-waiting) that made social activities like sharing and gifting possible. They developed tool *traditions* that were at the same time perishable and enduring— perishable in their material manifestations but enduring in that they shaped the neurophysiological, behavioral, and social capabilities of their descendents. It is likely that parallel neurological modifications, in particular the elaboration of mirror neurons, supported increased empathy among conspecifics, the ability for one creature to read the feelings and state of mind of others, and thus anticipate their actions. It was these very early tools that left no trace but were instrumental in building basic human groups whose sociality eventually began to extend beyond the purely biological ties of procreative groups.

A Digital World

It appears that we are now in the middle of another major societal transformation in which, again, tools are intimately involved. Geophysical lifescapes are giving



Guarani trap of sticks Photo courtesy Brigitte Jordan

way to a virtual world that is no longer accessible with traditional tools, be they electron microscopes or video cameras, but rather are of a completely different kind. Originally our tools—for making things and for making sense of things—were inextricably sensory-based physical tools (like the oracles of the Greek and the microscopes of scientists). They dealt with geophysical realities. But the symbolic/digital transformation we are witnessing now no longer allows direct access to the world through our senses, nor through the mechanical tools we have built so far. To access the digital virtual world, the tools of the current era are digital and based on concatenations of statistical algorithms.

What we see is that tools again and again have shaped human society in ways that we could not have anticipated. This goes from the prehistoric development of tools for caring for others (like feeding a toothless group member—totally unexpected at a site in Dmanisi/Georgia 1.8 mya) to tools for transporting supplies and resources, such as the (perishable) slings, nets and baskets that might have been used for

carrying babies, food, and useful raw materials to a new site—these were the kinds of tools that changed the structure of our ancestors' lives for generations to come.

Later, we see the emergence of new technologies changing society in all-encompassing, unpredictable ways (Arthur 2009): the steam engine, other transportation technologies like cars and communication technologies like the telephone and now the internet. And of course, each societal restructuring birthed a fresh set of tools which, in time, wreaked their own transformations.

Digitizing Human Society

Throughout our species' history and prehistory, progressively more sophisticated technologies, increasingly symbol-based, have shaped our lifescapes. I believe we are now on the verge of another huge transformative leap. A new driving force has become apparent: sociodigitization, the wholesale transformation of a geophysical world into digital representations (Latham and Sassen 2005, Arthur 2011, Jordan 2013).

The human environment is becoming a digital environment. Since the beginning of the current century most things social, cultural and physical (like real estate or professional expertise) have been undergoing a process of being digitized, transforming the geophysical reality of the human world into a cloud of digital symbols. Increasingly, largely ungrounded from observable physical phenomena, digital data are archivable at practically no cost. As every action is recorded down to mouse clicks, vast data jungles have appeared, the domestication and management of which is no longer possible with conventional tools. But new web-based digital tools are coming into existence to explore the promises of this situation, including powerful remote sensing technologies, search tools and archiving capabilities. These tools are algorithm-based probes into the structure of the digital cloud layer that rises up from and encircles our sensory-based, geo-corporeal world. Thus digitization holds out the promise of untold efficiency and reach because it makes data liquid and hypermobile, globally available, and potentially instantly actionable for anybody who can make meaning out of the digital deluge.

Looking at the future of anthropology in a digital world, the next step, already discernible, is a mixed research methodology consisting of physical body-based tools (think shadowing and participant observation) and algorithm-based analytic technologies (eg, Riopelle in Jordan 2013). But this time around we have the great privilege of "being there" as participant observers and active agents in this ongoing societal realignment, observing, documenting, and making sense of this world.

Conclusions

We've been tracing the ways in which the fates of humans and their tools have been inextricably intertwined in the co-evolution of technology and human society. Now the digital revolution is generating another major restructuring of human lifescapes and we ask: Why should we care? What can we learn from this process at the current time when we face an increasingly uncertain world where the digitization of most things social, cultural, and physical has led to the outsourcing of our lives to the cloud? When we face a situation where much of what we want to know about human existence and action is buried in a humungous digital data glut that current tools can't handle?

We know that throughout prehistory tools have played a major role again and again in restructuring the social formations that generated them, often with tremendous increases in human productivity, well-being and wealth, but also with major negative consequences (as happened with every major technology from farming to social networking).

We can be certain that to be viable some of these new tools will again become deeply embedded in our social world as they have been before. We know that they will change our society, that they will change relationships between individuals and groups, and that they will transform power relationships on all levels of society, from the family to supra-national, global structures.

We expect that these tools will once again shape the neurological, anatomical, behavioral and social structures of our species that we tend to see as indelible landmarks of humanity. We will look different. We will think differently, we will learn differently, and we will act differently.

We can expect that the intimate connection will continue. As new tools arise, congeal into regional and professional traditions, penetrate more and more spaces

in our lifescapes, who we are and who we strive to be, will be affected by the new tools.

Mindful of the fact that it was tools that launched us on the path to humanity in the first place, we can now entertain the hope that our awareness and expertise can help move the spiraling helix of human evolution into an increasingly more productive, cohesive, all-inclusive, peaceful, healthy, trajectory.

Brigitte Jordan, a consulting corporate anthropologist, has conducted research in industry and other large organizations for more than 35 years. She has published widely and is the recipient of numerous awards, including the Margaret Mead Award and the Xerox Award for Excellence in Science and Technology. Her website is www.lifescapes.org.

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