

Objects, technical systems and systems of thought

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Preamble

“Technical object” is an awkward term. First of all because, for those interested in the persons who produced or used it, an object is nothing “without the gesture that makes it effective” (Leroi-Gourhan); and then because to describe something as (merely) “technical” is tantamount to repudiating all that cultural technology has taught us in the last sixty years: that techniques are social and cultural productions in their own right, potentially connected to any of the domains into which we arbitrarily slice up social reality.* The most ordinary “technical” object – a bamboo knife, a bone awl, a sickle, a hammer, etc. – by the material use to which it is put or the ideas one has about it, can be a key component in a system of thought and action that is not particularly “technical” in itself. Techniques are as responsible for producing social ties as they are for transforming the material world. We do not know where techniques “stop”. Well enough. But do we know much more about what a “ritual” object is, or an “art” object, or a “mestizo” object?

So as not to belittle or forget the bulk of man’s material productions, we can at least arbitrarily decide where techniques start, or how they are conveyed: in the event, and by definition, by an action on matter. The anthropology of techniques (or cultural technology) is merely one point of view: the one that *not only* asks if an object is an element of a set of “political”, “religious”, “economic”, “artistic” or other practices and representations, but *also*

* In addition, if I may say, in view of the enormous stakes involved for understanding man’s technical nature, to spotlight the object is tantamount to giving “toolless” techniques (those not using objects) a separate place, which probably isn’t the best idea when investigating the development of technical behavior in primates.

asks in what way its conception and its material production are characteristic of the human group that manufactures or uses it.

When approached from this angle, whole swaths of cultural and social life suddenly open up to description and analysis. A small number of ethnologists (and sociologists, psychologists or historians) have devoted thousands of pages to this particular aspect of social life. The fact that these studies are largely unknown to ethnologists, museum curators and art historians is not a good enough reason to keep the public in the dark as well. Hundreds of thousands of such objects – let us say those that, in their original context, are used primarily to act on matter – are to be found in museums and should by no means be excluded from the European Cultural Heritage On-line (ECHO) project.

So there is no help for it: we have to talk about technical objects, or even worse, about “the” technical object. After all, if technical objects (or techniques) are tricky to define, it is clearly because they are overdetermined. The whole point of the anthropology (or sociology) of techniques is precisely to account for this overdetermination.

All this has already been pointed out by Mauss in “Les Techniques du corps” (1936), in which he demonstrated that even the most “natural” actions we perform on matter are cultural productions. Below is a subjective summary of the results and of the kinds of questions anthropologists ask themselves about techniques.

Even a basic bibliography would be too long to list here, but, in addition to the periodicals, *Journal of Material Culture* and *Techniques & Culture*, the classic studies by B. Gille (*Histoire des techniques*, 1978) A.-G. Haudricourt (*La Technologie, science humaine*, 1995), A. Leroi-Gourhan or J. Needham provide a good introduction to the field. I would add a recent book by M.-C. Mahias, *Le Barattage du monde* (Paris, Editions de la Maison des Sciences de l’Homme, 2002), which illustrates exactly what I have been saying here and has its place in the long line of works from the “French School” of cultural technology (Mauss, Leroi-Gourhan [e.g. A. Leroi-Gourhan, *Gesture and Speech*. Cambridge MA (Mass.), The MIT Press, 1993], Cresswell), which adopts an

approach to the relationship between techniques, culture and society complementary to that used in material culture studies.

Some key notions

For anyone interested in action on matter, the purpose of an object cannot be understood without the gestures and knowledge needed to put it to use. The term *operational sequence*, (the series of operations to be performed) designates the overall process that leads from a given state of matter to its transformed state. Usually there is nothing to indicate where an operational sequence begins or ends. Why separate the felling of the tree from the manufacture of the adz that makes it possible or the making of the drum that will be fashioned from the section of the tree trunk being cut up? Once again it is a matter of arbitrary divisions that depend on the questions asked; but that is certainly no reason not to tackle the problem.

The expression *technical system* is used by Mauss in his *Manuel d'ethnographie* (1947), in which, for the needs of his analysis, the technical system is presented as an isolated aspect of social reality. The notion of technical system was further developed by the historian B. Gille, who made it the fundamental concept of his *Histoire des techniques* (1978). As far as anthropology is concerned, I proposed the idea that, on first sight, techniques present three levels of interaction that give them a systemic character.

First, a technique (understood as a specific action on matter, delineated by the anthropologist for whatever reason) – tying your shoelaces, landing a Boeing 747, carving chips from a block of wood – is always made up of several components: the matter being acted on (which can be the body itself), “tools”, gestures, one or several sources of energy, actors and representations; it is a deliberately vague term that includes extremely complicated mental processes. These form a system, in the simplest sense of the term, defined by the fact that a change in one element can lead to modification of one or more of the others.

At a second level, in any *one* given society and at a given period, various techniques are linked with each other in various ways and for various reasons. Here are some examples:

-□ a technical action depends on the preceding actions: you have to go and cut the canes (or rosemary) before you can lash together the roof beams of your house (or tie up your bouquet garni);

-□ different techniques may use the same tool (think about all the situations in which you have to screw or tighten something or pull something out with pliers or pincers, for example);

-□ different techniques can include identical steps (pieces of an operational sequence);

-□ different techniques can result from the embodiment of identical representations in gestures and objects, in particular those having to do with “elementary means of action on matter”; they can use the same actors, the same raw materials, etc.

At a third level, a technical system (a material culture or set of productive forces) is always part of a socio-cultural whole that includes it. In particular, social representations of techniques often include more than the strict domain of action on matter. The ways an object is manufactured, used or exchanged are linked with practices and thought systems *that go well beyond simple material effectiveness*.

One crucial consequence of the fact that technical systems are embedded in a mental setting that goes well beyond simple action on matter is the element of arbitrariness involved in the borrowing, invention or transformation of these objects. Techniques come out of *choices* that are, to a great extent, always and everywhere – even in the case of our most “modern and rational” techniques – determined by considerations that are in no way technical. The whole problem is to identify where these choices come in, what is the logic behind them, what are the consequences, and so on.

One of the findings of recent research is that, contrary to what Leroi-Gourhan believed when he set out the anthropology of techniques program, arbitrariness, or “ethnic style”, which he tried to define at a time when the characterization of cultures was fashionable, does not concern *simply* the form or the decoration of objects (what he called the last degrees of the fact”). Today we know that the “choices” a society makes to adopt, reject or modify a technical component also entail elements that do not serve any material purpose – such as a particular

idea about the gender relations between the men and the women who are going to use the finished object, representations of the relationship between a given material and the cosmos or the gods, political considerations about the organization of labor, etc. Such non-technical representations (religious, political, concerning genders, local representations of beauty, etc.) weigh just as heavily on the way an object is thought about and manufactured (or on the way a technique is put to use), on its material effectiveness, and even on the fate of those who use it.

One of the huge unresolved problems in the anthropology and history of techniques is to understand how the best technical solutions (or what Leroi-Gourhan calls the “tendency”) ultimately win out, in spite of the multiple and, if the truth be told, unpredictable meanings with which the component elements of the technique are loaded and which interfere with the way objects fulfill their material functions. The question of whether this “noise” applies only to the definition and means of manufacturing elementary tools remains open. B. Latour’s research or my own work on recent aviation history shows that even the fate of such sophisticated objects as subways or airplanes rests largely on such non-technical representations of techniques. In other words, considerations having nothing to do with the material use of an object can weigh heavily on the way it is manufactured or utilized.

Since the object is only *one* component of a technique, the problem is to determine what additional information we need to get this type of message across; and how? Not being in the least competent in the matter, I will simply indicate a few examples of objects that, when placed in their anthropological context, would illustrate what I have been saying and the way humans have of doing more or less anything with objects, including living together, inventing myths, shoring up kinship rules or appreciating beauty... in exactly the same way as we could do with a “mestizo” object, a “sacred” object, an “art” object or a “ritual” object.

An ethnologist remarks on three deceptively ordinary objects

Drums that do more than make noise

The Ankave drum, called *songain*, a word that designates both the instrument and the ceremonies in which it is used, looks like a long hour-glass (77–120 cm in length for the ones I saw) made of two long, tapered cones joined at the tips and surmounted by a handle. The top part of the instrument, which is struck, has a maximum diameter of 11–13 cm, while the opening for the sound ranges from 12 to 16 cm. The drum skin and the pellets of wax that are stuck on to tune it receive the name of the material from which they are made (*sindre' waa'*, “snakeskin” and *undaa'*, “insect wax”), but other parts of the instrument are described using the vocabulary applied to human or animal bodies: “shoulder” (*saongwain*) for the handle; “mouth” (*mangain*) for the opening over which the membrane is glued and tied; “ass-hole” (*ike' mangain*) for the opening. The narrow part in the middle is its “neck” (*ngu'no'*). The cones themselves are both described as “middles” (*a'wone'*) in the sense of the “intermediate parts”. An Ankave drum is first of all a musical instrument, something that might be described laconically on a file card as: “wood, python skin, animal wax, mid-20th century?” On closer examination – that is carrying out a cultural technology study while there is still time – things are more complicated.



Songain ceremony, Ikundi, 1987

Fifty years after they discovered the unthinkable existence of white people and in spite of the periodical presence of Papuan catechists, which they always manage to get rid of, the Ankave continue to think as a group such crucial phenomena as the attribution of blame for misfortune, representations of sickness, imaginary cannibal attacks, the role of the shaman and respect for good manners. Management of misfortune, exchange logics and mourning procedures are regularly combined in ceremonies that enable this small group of forest horticulturalists to drive away, definitively they believe, the marauding ghosts of those who have died recently (*pisigen siwi*).

These *songain* ceremonies are the most visible part of a thought system that revolves around vile, man-eating beings, invisible and deeply hostile to humans, known as *ombi*, which the Ankave hold responsible for most fatal illnesses. Ontologically these are neither humans nor spirits, but the *sui-generis* combination of a human being (man, woman or a child having reached the age of reason) and a cannibal spirit. They make up a band of famished beings that play two essential sociological roles. First, because they attack, devour and share among themselves men, women and children who are believed themselves to have refused to share, the *ombi* are a constant reminder of that pillar of Ankave social order which is the obligation to acquiesce to all requests for food or objects. Secondly, they are charged with ridding the village of the flesh of corpses, which they are believed to devour.

But Ankave mythology also says that it is the *ombi* that humans have to thank for the *songain* ceremonies. It is they who, from the depths of a swamp, brought humans the hour-glass drums that are beaten night after night when the time comes to definitively dispatch a *pisigen siwi* spirit and to forget the deceased whose ghost it is. They are also to be thanked for the masks worn by the drummers and the songs sung during the drumming. At the same time as they discovered the drums, reputed to have been stolen from the *ombi*, men also discovered the shortness of life, sexuality, marriage gifts... As you we see, the matter is of some importance. The Ankave use these same drums today, either repairing them or making new instruments when needed.

For the expert on relations between techniques, culture and society, the preparation of this important time in Ankave life represented by the *songain* rites is therefore the occasion to discover one of the operational sequences that are the usual starting point in a study of cultural technology. With one outstanding particularity, however: the operational sequence in question is not one of those that the fieldworker observes, describes and writes down in his or her notebook. It is given by the Ankave themselves in the shape of a series of myths that provide a step-by-step explanation of how to make the instrument, while underscoring the key aspects of the imaginary device whereby the Ankave dispose of their dead: the origin of the drum skin, made from the skin of a snake-man; and the importance of the “neck” or middle part of the object.

Study of these myths, the ceremony of the rituals and observation of the drum and *nowimboxo* mask-wearer indicates that the hour-glass drum plays a crucial role in dismissing the spirits of those who have died recently: drawn in by the arms of the *nowimboxo* mask, the *pisingen siwi* spirit is driven towards the other world by the racket produced by the drum skin, the selfsame din that resounded on either side of the water when the Ankave ancestor discovered the wonderful object. At this point, the spirit of the deceased travels through the two pieces of the instrument on which the myths recounting the origin of the *songain* ceremonies have much to say: the narrow piece that connects the two chambers of the drum; and the python-skin membrane, which acts as a gateway to eternity.



*Songain ceremony,
Ikundi, 1987*

There is no mystery about how the spirit of someone who recently deceased passes into the world of the *ombi*. Even if it was not enough to know that the *ombi* make their own rounds to the sound of the drumbeat, while men keep them chained up night after night in our world, the fact that *ombi* are sometimes seen in the midst of the dancers carrying a corpse on their back would already lend weight to the idea that these rituals given to mankind by the monsters must indeed have something to do with the mysterious transmutation of *pisingen siwi* into *ombi*. In fact, the drums were associated from the start with exchange and the passage from the world of men to that of man-eating monsters. They are present on either side of the water since another drum, the *ombi* drum, is located somewhere in the depths of the swamp. At the instant it passed from a bubbling whirlpool into the hands of an Ankave ancestor, the instrument now held by humans also stood in exactly the position designated by the function assigned to it by the *ombi* and through them, by the Ankave culture: that of a double funnel linking the two sides of the same entity, the Ankave society, with its living and its dead. The hour-glass drum now appears to us for what it is primarily: a funnel-shaped psychopomp, that is to say the narrow canal whereby the ghost travels from the world of the living to that of the *ombi*.

Readings of a Baruya fence

Generally speaking, in New Guinea, the enclosures surrounding tuber gardens (and those containing sugar cane, bananas, etc.) result from a series of technical choices. First of all to enclose the gardens or the pigs rather than having to watch the animals; and second to enclose the gardens rather than the pigs. These choices have to do with the distribution of tasks between the genders or the generations and the density of the pig population (per km²), which determines the damage done by the animals when left to their own devices as well as the amount of work it would take to feed them in captivity. People have often preferred to protect their crops and let the animals forage freely, with a kilo or so of tubers being given to them morning and evening by the woman who raises them.

On the whole, that is the option retained by the Anga groups. On closer observation, however, several important differences can be seen from group to group: the observer who visits the valleys on foot is struck by the “details” whose technical function is difficult to interpret or even seems frankly aberrant. In Ankave villages, for instances, it is rare and even exceedingly rare, to see a completed garden fence, which raises a doubt as to their function as garden protection. The Baruya, on the other hand, erect barriers of sharp pointed stakes that regularly measure over 1,50 m (and up to 2 m) in length, something that can seem surprising if one knows that pigs, even hungry pigs in New Guinea are hardly noted for their jumping skills.

These Baruya fences are as impressive as they are non-“functional”, but they are also extremely sturdy: comprised of three layers of interlaced planks tightly lashed together, they can firmly withstand the onslaught of any pig, providing they are maintained. My notes indicate somewhere that each running meter of fence contains over 50 boards, all painstakingly interwoven.



A Baruya garden fence, Wonenara, 1985

This “aspect” and their solidity are the result of an undertaking in which it is not unusual to see ten or fifteen men working together to clear a new garden in the forest. The women

transport the fence stakes from old gardens in the valley and then gather and burn the underbrush, while the men – especially the garden-“owner’s” brothers-in-law and co-initiates – fell the trees and build the fences over the course of a week or two. Between turning the tree trunks into boards or sharpened stakes and assembling the fence, a veritable open-air workshop is on display to the observer. It is hard, too, not to notice that the fence is one of the occasions when male solidarity is displayed for all to see ... and hear.

In itself, this collective effort of fencing the garden is then the reaffirmation of a certain number of social relations, between close blood relatives, between brothers-in-law (above all), between co-initiates or between friends. These impressive ramparts against pigs, which elsewhere in New Guinea do not try to break through far flimsier obstacles – Chimbu fences are not even lashed together – are not only assigned the concrete task of establishing an impenetrable barrier between pigs and tubers: in them and through them a whole portion of the Baruya social order is produced, with emphasis first and foremost on cooperation, on sharing the work, all of which constitutes a number of features that set the Northern Anga (Baruya, but also Sambia or Iqwaye) radically apart from their neighbors in the south or the southwest, who in turn are characterized by a spectacularly low level of cooperation.



Building a living fence of “pitpit” (Sacharum spontaneum); on the other side of the cane screen, other men help install the countless tethers that hold the fence together, Wonenara, 1978

The Baruya's insatiable solidarity stands in opposition to the Ankave's determination that everyone should mind their own business, even if the neighbor is but a few minutes away – and a strong penchant for long stays in the forest. Cooperation is almost exclusively an affair of the couple, and even then the husband and the wife carry out complementary tasks. Whereas twenty or so Baruya men and women will work together to build a couple's house in a day, it is not unusual to see an Ankave man working on his house for weeks, always alone, though sometimes he will exchange pleasantries with a few relatives or friends who stop by. When an individual garden is cleared, an Ankave man and his wife take on the forest alone. The brother of one or the other can theoretically lend a hand, but this occurs so infrequently that I have never observed it. Even when it happens that two brothers-in-law or a man and his son-in-law clear a plot “together”, that is in the same spot and simultaneously, each works on his own patch. Frequently a man, even an elderly one, will clear and plant his gardens without the help of his married son. And the few times when a young husband-to-be comes to work for his in-laws, each reminds everyone that he is there of his own free will and is helping out just this once. For whoever is familiar with the Baruya valleys, the contrast is immediately visible and striking.

Of course there are some contexts in which cooperation is just as intense among the Ankave as it is among the Baruya – in particular in warfare and male initiations – but not in the area of production. When it comes to horticulture, hunting or the manufacture of objects, the Ankave and Baruya worlds are at opposite ends of the spectrum. Since no characteristic features of the gestures, tools or knowledge account for this disparity in the way they organize their work, it must be attributed to the other domains of social reality in which radically different practices are observed in the different Anga groups: namely, initiations, marriage, ways of working together.



Baruya initiations, building the ceremonial house, tsimia, Wonenara, 1985

“Doing things together” is a leitmotif of the Baruya culture. This may explain why newborn babies of both sexes are immediately placed in the presence of other babies “so that the little one knows he is not alone in the world”.



Newly born Baruya babies, Wonenara, 1985 (photo P. Bonnemère)

Concerning a homely magical pouch that won't end up in a museum

The Ankave's sacred objects, *oxoemoxe* (literally "fight-man"), occupy an eminent position in their symbolic system and in their political organization, for they are used by the masters of the initiations to bring the young boys (8–13 yrs. of age) to full maturity, to make them into adult men, in other words warriors, and to make them strong and brave, capable of mastering their fear. It is the possession of an *oxoemexe* that defines the function of the ritual expert (*oxoemexe*, "oxoemexe man").

An *oxoemexe* looks much like the magical bundles used in hunting or trapping, and takes the shape of a piece of barkcloth (*Ficus* sp.) folded into a roughly triangular package. This is a doubly complex object: first of all, internally, owing to the mixture of objects it contains; but also externally, due to its association with other material elements of the ritual system in which it participates – other objects, but also plants that go into making the sacred vegetal theater in which the ceremonies take place. In addition to these objects and plants, there are all kinds of clay that are smeared on the body, both as paint and as a protective screen. So that it is not so much a matter of the effect an *oxoemexe* has on the novices' bodies as the meaning the Ankave give the elements it contains. The specificity of this particular magical accessory represented by the Ankave sacred object stems from the concept people have of its action and its effectiveness, the origin of its powers and its relationship with the other elements of the ritual machinery. Hence the necessity of looking into the network of explicit or implicit meanings surrounding such an object.

An *oxoemexe* is much like those objects and ways of doing and saying things whereby members of the same culture recognize each other. It is utilized, experienced and even explicitly presented by the Ankave as the quintessence of their culture and identity; they recognize themselves in this object, but they also consider that they and their society are what they are because of the existence and utilization of this pouch. For them as for other Anga groups, these objects are at once a sort of magical package that defines the set of Anga tribes they know

about (all linguistic groups together) and sets them apart from their neighbors: all Anga have this kind of object, but only the Ankave have *oxoemexe*.

The ethnological study of Ankave sacred objects again shows that, once we go beyond the strictly esthetic and ethnocentric view of the art object – in other words beyond a perspective incapable of explaining what these objects are for the people who produced and used them, or even introduced them into the exchange circuit that brought them to our museums –, our sociological, technical and historical knowledge of the objects forces us to erase a number of dividing lines between the kinds of objects produced by a culture and between the disciplines that have something to say about them.

As Gell has already suggested, the boundary between the work of art and the utilitarian object is largely manmade, even if it is not (or not only) for the reason he suggests – that every meaning-full object is an artistic production – but quite simply because every material production must to be placed in the material culture in which it was made. The *oxoemexe* take on their full meaning only in relation to other objects and substances, to a vegetal theater, to individual gestures and crowd movements, to discourses, myths, emotions and to various ways of relating to time: time of the mythic heroes, duration of the initiation cycle, individual history of each *oxoemexe*. To account for such an object is to try to explain that, wrapped in this ordinary piece of barkcloth, lies a condensed version of the Ankave's history and powers.

Unlike the rolled hunting nets exhibited in a New York gallery or the eel traps that catch the eye of an esthete or curious passerby, the unassuming barkcloth pouch that holds the objects to which the Ankave attribute the extraordinary power to grow their boys looks like any *tapa* container and, unless I am mistaken, does not feature any of the rhythms, proportions or decorations that so often arouse esthetic emotion. In other words, while certain workaday objects, like Ankave eel traps, have at the same time formal features and significations that make them, for some people, works of art, there are also ritual objects, like the *oxoemexe*, whose appearance would relegate them at best to the reserves of an ethnographic museum.



Ritual display of Ankave eel traps moments before being placed in the water, Ayakupnawa', 1987

These sacred objects, imbued with multiple meanings so incredibly dense and crucial that the groups that use them charge them with responsibility for part of the cosmic equilibrium and their own social order, speak no less eloquently about the societies and the people that produced them. It is essential that these should not be neglected when exploring the multiple relations that grow up between objects, culture and society, even if it is difficult to imagine the museographical arrangement that might allow the display of one of these sacred objects in the context outside of which it is just another piece of barkcloth.

In passing, to grasp something of the uses and meanings connected with an eel trap or a ritual object that can still be studied is to glimpse the complexity of the practices and thought systems that animated these masterpieces now condemned to silence for having arrived in our museums without the ethnographic notes that would have allowed us to understand them better.

Fortunately – and contrary to the rumor that colonization destroyed all the systems of thought and practices of New Guinea – the big island does not want for objects that continue to concentrate whole swaths of social organization, ritual life and cosmological systems.

The Anga examples to which I limited myself for the sake of convenience, show that it is enough to visit certain valleys in the interior of New Guinea to be convinced that it is still perfectly possible to observe these objects in their local context; or to question those who saw them used as children, or whom their fathers or grandfathers told about them ... or who decided to turn them into souvenir objects for tourists.