Holloway's "Imposition of Arbitrary Form on the Environment", or a Unique Kind of Anticipation as the Onset of Cultural Humanisation

John Gilbert
University Ghent (Faculty of Philosophy)
Blandijnberg 2, B9000 Ghent.
jgilbert@ugent.be - j.gilbert@skynet.be

Abstract
In this exposition attention is drawn to a fifty years old article of Ralph Holloway, the content of which is insufficiently known outside the discipline of anthropology. Holloway observes that the standardized form of the earliest stone tool artefacts, exposes a turning point in cognitive organisation of the hominid species. The arbitrary form can be understood as the introduction of the concept of "object" and the act of projection itself implicates a cognitive posture of taking distance. The latter could as well be understood as anticipation.
Apart of drawing attention to this most interesting point of view, some critical questions and remarks are also formulated.
Keywords: paleoantropology, tools, language, cognition, objectivation, anticipation

1 Introduction

The exposition to come has two parts. In the first one the main idea will be unfolded. The second will be reserved for some critical thought. Let us evidently start with the central theme, the most remarkable observation of Holloway.

2 Unfolding the Main Idea

One of the most noteworthy ideas of the American anthropologist Ralph Holloway has been published in "Current Anthropology" in 1969 and again in 1992.

In "Culture, a human domain", the author elaborates on the observation that the early stone tools expose a standardized morphology. This apparently simple statement should not be taken lightly for an anecdote without particular meaning. The observed fact is symptomatic for a very specific way of organizing one's experience. In other words, it can be understood as an indication for a particular way of perceiving the world, more specifically as Holloway states by "the imposing of arbitrary forms on the environment".

Recapitulating, stone tools with that special feature that they all show the same morphology can be found in abundant number. It induces the idea that there must be a kind of projection of a standardized cognitive scheme in play, in particular on the one hand an imposition of a form which on the other hand is arbitrary of character.

International Journal of Computing Anticipatory Systems, Volume 26, 2014
Edited by D. M. Dubois, CHAOS, Liège, Belgium, ISSN 1373-5411 ISBN 2-930396-15-6

2.1 On the Meaning of Arbitrar

Before commenting Holloway's observation, more attention should be drawn onto the qualification "arbitrary". What exactly does it mean that 'the on nature projected form' is arbitrary of character?

In relation to the point of view taken, the understanding of the term can be more or less problematic.

From out a naïve realism for example, that is taking the world - as perceived - for the fundamental reality, the qualification "arbitrary" is only slightly problematic. Because in this situation the term refers to an instance which does not in a natural way make part of that world, but which has been introduced in to it as an innovation. The only question then is about the provenance of that suddenly appearing innovation.

If however one is appreciating "arbitrary" against an embodied constructivistic background, the understanding of the term becomes quite more problematic.

Because of the in principal unknowable character of the world – the well know Kantian point of view - form and content of the perceived environment are constituted in and through the coming together of "the input" on that very moment and the specific bodily capacities of the organism in question. So a bat, an owl, a spider or a man, however the input at one given moment should in principle be the same, they all have a different world based on their particular embodiment. Or, in a more active formulation: they all impose their particular forms on whatever might be "out there". Thus understood "imposing a form" is by no means exceptional, on the contrary it is the default condition.

This 'being arbitrary by default' however, does not exclude the possibility to discriminate the particular imposition meant by Holloway. Let us see how.

2.2 And further: Imposition of an Arbitrary Form

The initial construction of the world specific to a certain organism, is the product of the most primary motives instantiated in the particular embodiment of that organism which is engaged completely into an event. That event is not to be understood as something unfolding itself in front of the organism and onto which it reacts, no, the organism is totally engaged into it, itself being constitutive part of that event.

So far for the initial position. Let us now introduce Holloway's "imposing of an arbitrary form", a citation in which two meaningful components can be recognized.

"Imposition" on the one hand denominates an act onto some item situated at a distance. It is precisely that being distant that allows the act of imposing. The distance is the necessary condition in order to be able to perform the act of imposing. This organisational pattern can also be recognized in the "mental" posture which accompanies contemplation, thinking *about* something. The central issue here is, that in an act of that kind, the actor is no longer totally engaged in the event in such a way that

he himself is part of that event. It is at this very instance that the posture of anticipation can be discerned[1].

"Arbitrary" on the other hand refers to a decision which comes into being on the basis of arbitration – that is to be understood as the evaluation of different points of view, different arguments, different values.

The resulting act of imposing an arbitrary form, surpasses the embodied constructivism earlier pointed out as 'the initial state'. It does not do so in the sense that the named act should no longer be subject to the determination of the embodiment, but in the sense that *the organism has the experience* to be able to detach itself from the blind and binding engagement as mentioned in the initial event.

So from the cognitive manoeuvre, a change in experience comes forth. This is the fundamental meaning of Holloway's observation, certainly becoming clear in the following citations.

2.3 Synthesis

"It has been argued that tool-making allows us to make some inference regarding conceptual processes imbedded within an arbitrary – that is non-iconic[2] - framework." And further he refers to "... the frames of reference" and describes these as "the anchorages which aid to separate the figure from the ground..." (1992:57). He goes on "...acts of producing structure where there were none before, where the final product has no necessary relationship to the initial object." (1992:58).

What he says here refers on the one hand to a change in cognitive *production*, the act of the formation of figure where until so far there was only an event. Figure – which can be understood as "object". That should however not be taken in a naïve physicalistic sense as a chunk of hard stuff. It is rather to be understood as a frozen moment in time, as a slice of the flux, better still: as a demarcation into the flux which acquires the form of a solidified configuration. So far for the object as the result of cognitive production.

On the other hand, what he says implicates also a cognitive *organisation* in the exposing of a distinction between the actor and the object. Would it be too bold to suggest that this very distinction supplies the substrate for a general cognitive perspective of anticipation?

In short, Holloway observes in the earliest forms of tool fabrication, the introduction of "the object" which unavoidably implicates an attitude of cognitive anticipation.
It was this particular cognitive tuning into the perceived world that, for example nearly two million years later, allowed to harness fire as an object on a distance, making into a cultural asset something that until that very moment was nothing else than a pure natural phenomenon giving rise to awe.

---

1 It is obvious that this type of anticipation is "weak" since the introduction of it is contingent. It does not follow from lawful regularities embedded in the system, as for instance is the case for homeostatic processes on cell level. For the distinction weak versus strong anticipation, see Dubois (2003).

2 Iconic to be understood as perception bound in contrast to non-iconic in which case there is no necessary relation between symbol and referent.

2.4 Holloway's Inspiration

Before discussing some details, I would like to add the following.

Holloway has been inspired by a publication of Clifford Geertz, another anthropologist of that time but who focussed mainly on the importance of symbols. It is Geertz who in 1964 pointed to

"the imposition of a framework of *symbolic meaning* upon reality…".

But I am convinced that Holloway's formulation is of far greater importance. Because what Geertz is suggesting indicates a point in evolution which is already way to far past the crucial moment. As speaking of a symbol is referring to an already too advanced specialisation out of a more general pattern. The substitution of 'symbol' by 'arbitrary form' is the merit of Holloway. By this he refers to the preceding moment of greater importance, the moment the cognitive scheme of "object" and the necessary posture of distance taking could for the first time be recognized in the making of artefacts.

My enthusiasm for this insight should have become obvious. But this does not mean that I agree with Holloway on all accounts. So allow me to draw attention to some arguments of his, which to me seem quite questionable.

3 Critical Remarks

In this second critical part we will deal with two topics: the specific relation of tool and language and secondly, the importance Holloway attributes to the social context.

3.1 How Holloway Sees the Relation Language – Tool

The imposition of arbitrary form exposed by early stone tools, presupposes according to Holloway, the practice of language.

His particular view will become clear through the following citations.

"The tools made to standardized patterns, *do not ... prove* that their … producers had a language based on symbols and – also - I can see no good reason to claim that language must have *followed* tool-making" (1992:56). Further "Tool-making and language are concordant".

The 'concordance' here is obviously taken as referring to a time frame. Since he claims that there is no proof that there was language *at the moment* of production, but he neither can support that language *follows* the introduction of tools.

However 'concordance' seems also to be taken with a qualitative meaning. This is clearly expressed in

"…tool-making and language are similar, if not identical cognitive processes…" (1992:48)

So however the introduction of language did not leave any tangible testimonies, he suggests that language and tool making occurred simultaneously in evolution, and both fall back on similar if not identical cognitive skills.

He further argues that properties characterizing language can also be recognized in the process of tool production.

Both he says, obey strict rules about serialization and, expose hierarchical organisation. Both generate arbitral configurations, which thereupon are being perceived as part of the environment.

He also draws attention to the fact that language design features[3] listed by Hockett such as generativity, duality of pattern and arbitrarity, can be found in the making of tools[4].

For instance, in most cases a tool is multifunctional illustrating the property of generativity. Duality of pattern in language means that a set of elements devoid of meaning, combined in a certain way - gives rise to a new set of entities which in turn are meaningful. Projected to the use of tools, each and every partial act is without meaning whereby the end product clearly shows a meaningful function[5].

He concludes

"In short, there are these analogies between language and tool-making - in terms of the design-features taken as unique to the human case. I am insisting – he stresses - that the cognitive processes involved, are the same."

3.1.1 The Succession of Language and Tool and Language in the Anthropomorphical Sense

However I can full-hearted agree on his basic idea about the imposition of arbitrary form, some of the fore mentioned underpinning thoughts seem quite remarkable to me.

-1. First of all, in his perspective the elements are ranged in a very specific order.

For instance, he checks if design features of language can be noticed in the process of the production of tools. He does not do so the other way around - looking for properties of tool production in language. Neither is suggested that the very same set of properties could equally be found in both language and tool making. However, the latter possibility is in some degree present where he writes that

"... I am insisting that the cognitive processes involved are the same."

But this in turn is swiftly invalidated on another page where he suggests that the standardisation of forms presupposes consensus, and that in turn presupposes a form of communication falling back on the use of arbitral elements, meaning symbols and thus meaning 'language' and, that language with *its* cognitive properties must have preceded tool making.

By exposing this specific order, I do not implicitly suggest that this ordering is wrong per definition – so far I only want to draw attention to the organisation of elements as he sees it.

-2. A second remark is about the level, Hockett's design features should be related to. These features are specific for language where language is understood as the

---

[3] A design feature is a property present in some communication systems and not in others, which allows systems to be classified. Hockett lists sixteen of this type of features which should be characteristic for human language.

[4] It should be noticed that Holloway makes a strict distinction between the making and the use of tools.

[5] The same indications are also used in Greenfield (1991) and Ambrose (2001).

transmission of information. That is the transmission of elements which are meant to induce in the experience, a displacement in time and space.

But design features taken in that sense are properties on a higher level of development, not related to the basic affecting of one organism onto the other. Since two levels can clearly be discerned. The basic level is about one organism acting onto another. The second level – carried by the basic one - is aimed at provoking an experience in the other, a particular experience charactized by displacement in time and space or information.

Design features are related to the latter, that is transmission of information, a higher level process.

When now looking for the crucial characteristics common to tool use and language, the question rises if one should be looking *on* the more basic level – the one of manipulation or *on* the derivative level of transmission of information?

In first instance it seems reasonable to suggest that the properties at the most basic level are of more importance because, they provide the threshold for the higher level properties that can be derived from it. This view on priority is also sustained from the very different perspective of neurology. Broca's area[6] – the proverbial centre for language – seems at the most basic level dedicated to motoric of the hand.

-3. A third consideration is closely linked to the previous one.

The question rises if the design features as such, are not an indication for an all too anthropomorphic approach? Formulated in another way: are human communicative properties such as the intentional transference of information characterized by displacement, not projected onto more animal like interactions of which can be supposed that the named properties are not occurring?

In the initial situation which has been mentioned before, the organism is caught by the event into which it is rather blindly engaged – meaning not by reflection or choice based on free will. Human communication however implicates a chosen intention to inform about situations which have been or are to be developed outside of the actual context. Design features are explicitly related to properties of that kind, think for instance about the duality of pattern or the arbitrariness. As such they depict a highly evolved human mode of communication which Holloway projects onto not fully cultural human beings yet as might be supposed of the australophitici dating to 2.4 million years ago.

This might be considered as a degree of anthropomorphising or more mildly put anachronism. The bottom-line is that Holloway does not take into account a pre- or protocultural human condition of being in the world.

The critical remarks so far have made clear that the author deploys a very specific point of view in which language preceeds the development of tools. Furthermore he seems to understand language in its actual full blown capacity of informing, neglecting a most probable protolinguistical phase.

---

6 Cfr. Hewes (1993)

3.2 The Conditions for the Cognitive Objectivation are by Holloway Presupposed in the Social Context

Holloway does not consider language or tool making as isolated capacities. For him they seem deeply entrenched in the social fabric.

"...the frames of reference, the perceptual sets, all were established in social groups. ...tool making must be approached from the viewpoint of social psychology..." (1992:57).

And somewhat later in the text one can learn that he is not as much interested in the technical details of tool making but that he is

"...concerned with the more general aspects of socially mediated rules involving a set of operations that produce an arbitrary form. Stone tools [...] give evidence for a very simple but significant fact: *conformity of behaviour.*"

Following this line of argument the object as cognitive template, must have come into being within a framework of already existing social ties of such a nature that they surpass animal like intragroup relationships[7]. Here a degree of rule governed behaviour is presupposed. The introduction of rule governing at that very moment implicates that the cognitive template of 'object' - undetachably linked with distance taking or anticipation, did not expose itself in the making of tools, but in the social context in which tools are being made.

Allow me to stress that the putting into practice of explicit rules, presupposes the objectivation of the other, as a necessary condition in order to reach consensus.

So if objectivation and distance taking did not find introduction in the process of tool making, the question at what moment they then did, becomes quite pertinent.

One possible answer is that some causal factors lie still further in time and stay undiscovered and so unanswerable until now; or Holloway's depiction bears the character of an anachronistic projection. In the latter case, objectivation which we today experience as a quite natural cognitive intervention, has been projected back on the then existing group dynamic. What exactly does that mean?

The standardization of the form of tools, which is the central element in his exposition, is nothing else than the perceivable product of cognitive modelling, in this particular instance: a modelling characterized by arbitrariness (of the imposed form). The crucial fact is that according to Holloway, that does not occur for the first time in tool making, but the conditions would already have been present in the type of group organisation. In short: what he announces as a major insight – the standardization of form – is being projected on already existing intragroup relations.

This is problematic not only because of the twist in the argumentation, but also because both are of a very different order.

I will make myself clear. The standardization of form is deduced from archaeological findings and so based on hard empirical evidence which in no way can be neglected. His assumption about a specific group dynamic on the other hand, can not be anything else

---

[7] "Animal like intragroup relationships" is to be taken here as determined by primary motives such as procreation, feeding and sheltering in which case pure iconic perception – so not mediated communication – rules the group dynamic.

than speculative and therefore can not be presented as being of the same order as the first argument based on empirical evidence.

Holloway takes this line of thinking even further.

In relation to learning, he writes

"The important question is whether or not other processes – other than imitational and observational learning which he is referring to further in the text - were also operating, such as *consensus* or *explicit rules* about the forming processes. What is at issue is concatenated activity according to rules, meaning: grammar. Imitation and observational learning seems to me insufficient (...). It seems more likely that rules, consensus, syntax did exist and that a communication system using symbolic language existed at least by the time of hand axes, if not before." (1992:53)

So the standardization of form does not only go back on specific types of already existing intra group relationships, he goes that far even assuming the existence of a type of language which is symbolic.

This comes down to the encapsulation of an archaeological grounded cognitive innovation, with pure speculative considerations for which there is no evidential material at all. Furthermore, his depiction is inconsistent with a more sound and more general accepted chronology amongst paleoanthropologists.

The first findings in Hadar and Oldovai go back to 2.4 million years. The Nariokotomeboy discovered by Leaky is dated at about 1.4 million years. Walker and Shipman, part of Leakey's team report that

"...anatomy, archaeology, and genetics – all point to a single conclusion. True language seems to me to have been a very recent acquisition, one that just precedes and enables the evolution of anatomically modern humans and fully modern behaviours." (1997:234)

Further we read "...and yet the Nariokotomeboy could not talk and he could not think as we do. For all of his human physique and physiology, the boy was still an animal – a clever one, a large one, a successful one – but an animal nonetheless. (ibid:235)"

This description puts the different elements in a more unforced and more natural appearing relationship. The use of tools is situated quite early in the relevant evolutionary time slice. Language based on the use of symbols is pinned down on a far more recent moment[8]. The timeframe is quite large, the development slow, the introduction of language following that of tool making and – use feels more natural.

In contrast, Holloway's ordering whereby group dynamic partly is based on consensus and further, language as a condition for the introduction of arbitrary form feels far more forced and artificial.

[8] For tool making preceding the introduction of language, see also Wildgen (2004).

4 Conclusion

One might get the impression that the critical remarks formulated are quite considerable, and they are indeed. But the appreciation for the central insight is of far greater importance.

Holloway freed the essence of the idea about the imposition of an arbitrary form, out of the narrowing framework of the use of symbols as formulated by Clifford Geertz.

However this insight does not clarify the why of the cognitive reorganisation discussed in this paper, it possibly contributes to the demystification of the turning point from which the hominid branch evoluated in the direction of the modern cultural humans we are today.

References

Ambrose S.H. (2001). Paleolithic technology and human evolution. Science, volume 291, pp. 1748-1753.

Dubois D. (2003). Mathematical foundations of discrete and functional system with weak and strong anticipations. Anticipatory Behavior in Adaptive Learning Systems, M. Butz et al (Eds.). Lecture Notes in Artificial Intelligence, LNAI 2684, pp. 110-132, Springer-Verlag, Berlin, Heidelberg

Greenfield P. (1991). Language, tools and brain: the ontogeny and phylogeny of hierarchical organized sequential behavior. Behavioural and Brain Sciences, 14, pp. 531-595.

Hewes G.W. (1993). A history of speculation on the relation between tools and language. In Gibson K.R. and Ingold T., 1993, *Tools, language and cognition in human evolution*, Cambridge, Cambridge University Press.

Hockett, C. F. and Altmann, S. (1968). A note on design features. In Sebeok, Thomas A., (ed), *Animal communication; techniques of study and results of research*, pp. 61–72. Bloomington: Indiana University Press.

Holloway R.L. (1981). Culture, symbols and human brain evolution: a synthesis. Dialectical Anthropology 5, pp. 287-303.

Holloway R.L. Jr. (1992). Culture: A *human* domain. Current Anthropology, Volume 33 Supplement, pp. 47-64.

Walker A. and Shipman P. (1996). The wisdom of the bones, in search of human origins. Vintage Books, New York.

Wildgen W. (2004). The evolution of human language. Scenarios, principles, and cultural dynamics. Advances in consciousness research 57, University of Bremen; John Benjamins Amsterdam.