## **Buddhism and Culture: The Search for Definitions**

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## ABSTRACT

The problems associated with the definition of the word "culture" are crucial to our understanding of how it can be used in Humanistic Buddhism. Culture as the highest and best of human endeavors reflects itself in Buddhist art and literature. The question of how to deal with culture that is seen as the "ordinary" creates a very different context.

If all ordinary human activity can be considered as "culture" then how does this relate to the Buddhist practice and thought? Nationalism, racial divisions, and regional identities bring another set of issues regarding the nature of culture. In our contemporary world, technology has become a major factor in cultural activities, including the blurring of the boundaries between organized inorganic matter such as silicon chips and the organic capacity of the cortex. All of these complexities indicate that "culture" presents us with the full array of human efforts and material productions.

In 1997, I organized a workshop that conceived a project called the Electronic Cultural Atlas Initiative (ECAI).<sup>1</sup> When we finally accepted the word "cultural" in the name, it was not without hesitation. I was acutely aware of the pitfalls of dealing with the term and could not but remember the expression "When I hear the word 'Culture', I reach for my gun." It is an example of how common expressions come into existence and take on a life of their own. The source for this one is in the play *Schlageter* written by Hanns Johst and premiered for Hitler's birthday in 1933. The line from the play is a bit more chilling "Wenn ich Kultur höre … entsichere ich meinen Browning!" 'When I hear "culture," I release the safety catch on my Browning'<sup>2</sup> The implication was that the gun was in hand and ready, an apt description of Germany in the 1930s. The Nazi leadership would quote this line in the following years as an indication of the views they held on culture as opposed to their own political agenda.

While I have tried, over the years of working with ECAI, to avoid the definition of "culture," this conference is a forum that gives me an opportunity to reflect on the term. Mind you, there is no promise in this paper of giving a definition, but I will explore the history of attempts to do so. I hope you will allow me to give a number of references to the experience of working with ECAI since it has been a major preoccupation for my time and energy over the past seven years. This is my way of trying to show the cultural dimensions of Buddhism that are so complex it requires the application new technology, software, maps, images, and digital library sciences for an adequate presentation.

The basic principle of ECAI is the attempt to index information by use of the metadata categories of "time" and "place." Capturing aspects of culture in map form is not without problems. We find it impossible to define a cultural aspect that is encompassed by a static polygon drawn by using latitude and longitude. ECAI has

tried to deal with the fact that anything identified as a culture trait has been in constant motion; it is a flow rather than a static element. One way of including this in the dynamic digital maps was to add a timeline, using and helping to develop a software from the University of Sydney called TimeMap.<sup>3</sup> Providing some form of animation from the combination of latitude, longitude, and time has helped to create an imaging process that displays the nature of the networking between regions, religions, individuals, and artifacts. It is by no means a perfect solution but such technology offers one avenue for storing and retrieving cultural data. The presentation of the data in a dynamic map format allows us to overcome some of the former problems of having static maps that have neat clearly drawn boundaries but fail to represent the ever changing face of social interaction and development.

One of the great challenges that scholars face is the enormous amount of data that is available and increasing every minute. It is now estimated that the internet contains the equivalent data of 50 Library of Congresses.<sup>4</sup> ECAI is one attempt to put cultural data into the index of place (latitude and longitude) and time. This may be the only way to have a simple catalogue that can access all the data that our digital libraries of the future will hold.<sup>5</sup>

As I have observed the hundreds of projects that are listed under ECAI and registered in TimeMap, it is evident that the mapping of trade routes, spread of particular religious traditions, epidemics, and use of artifacts is not the same as the mapping of political boundaries of nation states. Historians have tried to discuss culture and political entities ever since the Greek times as described in the works of Herodotus.<sup>6</sup> The 19<sup>th</sup> and 20<sup>th</sup> centuries have been filled with attempts to understand the national character of nations that were being invaded or coming under colonial control. One of the most influential of these culture studies was the work of Ruth Benedict, and her description of the Japanese culture at the end of World War II. In The Chrysanthemum and the Sword,<sup>7</sup> she provided the Allied military with her insights about how to deal with Japan, as it faced defeat.<sup>8</sup> While Japan was an island nation with a long history and lends itself to such analysis, there are many examples where disparate peoples and cultural heritages have been placed within a newly formed nation state boundary. Nowhere is this more obvious in our present day than in what is now called "Iraq." <sup>9</sup> Sovereignty as declared by a state is given precedence over local authority and in the process cultural history and background is overridden. It is understandable that the officials at Hitler's birthday party would have understood the words of the play that scorned a concept of culture that might threaten the plan they had for control of regions rich in local heritage and history.

This approach may be termed "identity" cultures. What we see in the political realm is the struggle between those in power who wish to have a legal "identity" under unified and central control as opposed to cultural spheres where people practice and live in ways that sweep across the carefully controlled boundaries and thus tend to create fuzziness where governments want precision. Korea has been a good example of this interplay. The culture and linguistic region of dominant Korean content is by no means contained within the political boundaries. Stalin was acutely aware of the problem and he solved it by simply moving all of the Koreans living on the Soviet borderland to a distant place in Central Asia.<sup>10</sup> The Jilin Province of China filled with

hundreds of thousands of ethnic Koreans also reflects this lack of a clearcut way of defining the boundaries of Korean culture.<sup>11</sup>

These explorations in ECAI have still left me without a clear definition of "culture." However, it does appear that cultural traits are "international" and cannot be delimited by political boundaries. The most ambitious attempt at definition was probably the project of Alfred Kroeber and Clyde Kluckhohn more than 50 years ago. They scanned the extensive literature of Anthropology looking for the various ways that culture had been described and came up with 146 different definitions.<sup>12</sup> Such multiplicity is an indication that the term will not easily yield to a simple definition.

This diverse list of the anthropologists was in many ways in contrast to the attempt of the 19th century writer, Matthew Arnold. He wrote in Literature and Dogma that culture was something that resulted from focusing on the best that had been taught or spoken.<sup>13</sup> He gave this single definition of culture, exemplifying the values of his Victorian heritage. This might be characterized as a Neo-Platonic view of abstract beauty and truth. For Arnold and his contemporaries, the enhancement of life came from those who followed these ideals. From our perspective, we see the flaws in his approach -- a Euro-centric concept of civilization that was inevitably tied to the religious and political agendas of the rising colonial empires. The statements of Arnold led to a negative reaction since culture was being linked to the idea of the superiority of one class over another.<sup>14</sup> This extended far beyond Great Britain and was one of the burdens of colonial peoples who were excluded from the claims of refinement that characterized the ruling officials.<sup>15</sup> While the 19<sup>th</sup> century view, of Platonic ideals as the nature of culture, appears benign on the surface, the events of the last century show us just how important and even dangerous cultural claims can be. Unfortunately, the word "culture" has been used by political powers for justification of actions, legitimacy of rule, and destruction of perceived dangers among the populations. This negative use of culture was most prominent in Germany of the 1930s and 40s where it was a rejection of universal principles in favor of an idealized nation state and racial definitions.<sup>16</sup> Hence, the response of the Nazi leadership to the line in the play that looked on any universal claim as something to be destroyed. The Soviet Union also inserted cultural controls into its official policy<sup>17</sup> as did the Chinese with the Cultural Revolution.<sup>18</sup> When culture is a tool of politics, it becomes ideological and therefore limited in range of complexity, especially when that complexity might threaten the governing powers.

As we have discovered in ECAI, it is difficult to determine a discrete culture that does not overlap or migrate or exhibit a network that has extensions far beyond a point of observation. I have to admit that certain cultural patterns can be viewed in the same way that medical science deals with an "epidemiological" event. When I hear medical researchers describe the complexity of tracing the origin and occurrence of disease, it does not appear to vary in map displays, for example, from the study of the spread of Colonial missions in North America.<sup>19</sup> The animations based on the time of foundation and the location, show the spread, disappearance, and network determined by the cultural carriers and a host of other conditions including trade, transportation, national claims, and types. The maps display a complex social distribution rather than a single unit. This seems to fly in the face of one school of Material Culture Studies, that deals with the problem of understanding human and material objects, without

making reference to time and space.<sup>20</sup> That is to say, the relationship between humans and material matter can be in the distant past, the immediate moment or the distant future. The events of the interaction can take place anywhere and thus have no need for maps or timelines. And yet, space cannot be totally removed from the archaeologists framework.<sup>21</sup> As Godelier notes, "space" is a concept that is spread across various regions and among communities of humans. It is, in that sense, a social element and therefore an essential aspect of cultural study.

We can look at this with regard to Buddhism. There is a part of the cultural study of Buddhism that focuses on art and ideas from the ancient texts. In a Neoplatonist guise, Buddhist art fills museums around the world as the ideal expression of the religious culture. Buddhism is represented and identified by displaying artifacts that include some of man's most creative productions. All of the values of Arnold can be identified as inhering within the art and imagery of such Buddhist artifacts. A similar procedure can be seen in the use of Buddhist literature. The ideas from the sutras and commentaries are often taken to be normative Buddhism. These ideals and descriptions of Buddhist activities of the past, expressed in the texts, are often given precedence over any other form of the practices of Buddhists. There is no denying that Buddhism does have a strong and magnificent cultural heritage that survives over time in the art and texts. It can be said that this art and literature enhances the world. Can this be the definition of culture that will adequately describe the social and experiential models of Humanistic Buddhism?

Even as Arnold was expressing his Neoplatonic ideals about culture, the newly arising discipline of anthropology was looking at it from another angle. It was E.B. Tylor who joined a committee of the British Association for the Advancement of Science to make a definite list of those categories that can be described as cultural. The group meeting in 1872 defined seventy-six of these topics.<sup>22</sup> Following this approach in 1938 there was a list of more than 600 items divided into nearly 80 divisions. The lists attempt to describe all human endeavor and include some activities that would hardly have been in the Arnold sphere...such as canabalism as a cultural event. It is obvious that the ethnologists and anthropologists did not limit themselves to the best of human behavior. The array of human achievements and activities is so vast that it probably impossible to ever compile a complete list.<sup>23</sup> And even if we could come close to having the full inventory of cultural traits, in what ways would it serve our research and study. As early as the 1920s, Franz Boas<sup>24</sup> and Ruth Benedict<sup>25</sup> were warning of 'diffusionism' that was being traced from the study of the lists of cultural traits or features. Boas put forth the idea that social structure must have integrated systems of symbols and values, not a random selection of features. This school of thought came to be known as "particularism."<sup>26</sup>

With these strong attacks against the limitations of looking at culture only from the view of the "high" arts, it is understandable that a new and wider definition of culture must emerge from the debate. In many ways this happened when Raymond Williams divorced the word culture from the narrow view of Arnold. He first announced his conclusions in the seminal article: "Culture is Ordinary".<sup>27</sup> It is a simple statement but the import has continued to echo in scholarship. With the work in ECAI, I have long supported the idea that any human artifact or activity can be appropriate for inclusion in the data indexing. Culture is what occurs everyday and in

every place where human activity is found. It can be described in the smallest household task or the symbolic acts representing the system of meaning for an individual. This also seems to be similar to the move that Humanistic Buddhism has made in saying that the religion is not limited to the monastic community or the statements of the ancient texts. It is a system of practice that must be viewed from the point of view of ordinary life and the problems of it. In this sense culture is 'ordinary' and therefore Humanistic Buddhism is 'ordinary'. This is not downgrading either culture or Buddhism; it is a way of saying that both are interacting with humans in the day-to-day life.

If we say that culture is ordinary, it does not mean that culture is less important by virtue of that ordinariness. Williams pushed the idea that society has its own institutions and information...its own cues and cue-givers.

Those who support the idea of culture as the ordinary have tried to define how our societies create purpose and meaning from the complex of human activities. They maintain that the expression of culture in institutions or art must be determined by how society finds some commonality of direction. From the observations of the anthropologists and ethnologists, this direction is determined by two aspects... training and learning. First, every individual must learn the purposes, the forms, and the interpretations of acts. Once this learning has taken place then it is possible to perform the work of the society, to make reasonable observations and to communicate with others who have undergone the same learning process.<sup>28</sup>

This process of learning the 'ordinary' can apply to religious practices as well. Community members must learn to see and deal with the structures and beliefs that provide the commonality of direction. Humanistic Buddhism must then recognize that there is a training aspect needed to help people recognize and begin to understand the purposes and the meanings of the tradition. When this is achieved, then a growing sense of community allows members to readily communicate with one another, even in the most ordinary of situations.

A second aspect anthropologists have noted is that the training which members of a society receive must be tested. Only when the members of the group find that the action will result in positive results in daily life will the activity be continued. If there are teachings that do not test out in the everyday world, they will fade away and not be incorporated into the culture of a people. For this reason, it is quite important to note that the teachings of the directions and meanings are only a first step. The testing and the making of comparisons is the inescapable second one.

Humanistic Buddhism faces the challenge of the cultural sphere. Culture is both learned and shared.<sup>29</sup> These two attributes go hand in hand. We cannot conceive of how learning can be separated from shared ideals. That is because learning is the transmission of knowledge from one generation or one person to another. The transmission must always be followed by the integration of the knowledge into ordinary life with the subsequent adaptations. Since culture is sharing, it is a social event. An action that is done by only one person does not fit this definition of culture. Culture is learned and we have examples of this process of teaching in every society.<sup>30</sup>

Similar to these arguments are those of processual archaeology that explains human behavior through a study of material objects, indicating that culture is created by non-human determinants. For some, a type of determinism is expressed in which these objects and the systems that develop from them become so important that no human can change them.<sup>31</sup> Perhaps the earliest example of this is the role of fire in human development. Using the technology of being able to start a fire at any time, human culture made certain cultural moves that could only have occurred in relationship to this non-human element. From fire came the subsequent technological advances of such items as pottery and how the presence of these objects became an integral part of the human experience. At one level, man as tool maker gives a very simple answer to the question of how humans have expanded their range of strength and capacity by relying on constructions. Shore has brought to the attention of the scholars the importance of looking at psychology and neurology as ways of understanding some of the cultural developments. His look at tool making is one of the more challenging of our contemporary researchers. I make reference to tool building because a new and revolutionary technology has come into wide use.

The opposition, to this idea that material non-human objects have been determinants of cultural development, has been taken up by the post-processual group.<sup>32</sup> They maintain that more than just the physical objects are the individuals who act. Thus the study of culture has to focus on the evidence that can be drawn from the purposeful activity. As might be imagined, such rigid formulations of studying only material objects on the one hand or individual action on the other, have given way to a broader view. The scholarly community that now explores these problems is focused in Material Culture Studies.<sup>33</sup> They recognize that the material world both constrains and propels the behavior of humans.<sup>34</sup> That is to say, we need to study both the material objects and those humans who made use of them within their societies.

In our contemporary situation, the study of culture is taking on a wide range of new aspects and issues. We are living in the era of digital and biological discoveries and applications that redefine the role of humanity and environment. Genetic research has opened the challenge of discovering the degree to which our abilities and skills are given to us at birth. The instructional coding determining the function of the genes does not appear to carry cultural material. If we look at the human situation from this perspective, then culture is learned. It is not a part of the basic DNA and genetic heritage. Such a separation is disputed by Neo-Darwinians who have defined cultural activity as survival techniques. People do what is necessary to stay alive<sup>35</sup> and therefore, we cannot exclude the "selfish" gene from our consideration of culture. Richard Dawkins coined the word "memes" to explain meaning that is transmitted from one generation to another by training rather than genes.<sup>36</sup> L. Binford suggestes that culture is simply man's way of adaptation apart from the physical means of doing so.<sup>37</sup> These debates reflect the ancient problem of 'body' and 'mind', that is how to determine the relationship of the body to the reflective thoughts of individuals. In much of the biological descriptions of today, 'body' has become the genetic makeup of the individual. This has forced us to consider 'mind' within the biological sphere. It is quite possible that the concept of karma will be more or less understood by the contemporary generation as a genetic 'given', rather than a metaphysical explanation of our life on earth in human form.

I make reference to tool building because a new and revolutionary technology has come into wide use. The digital world of information technology has been invented and is just now sweeping through the world. The digital technology has created what can be termed 'organized inorganic matter'38 that has a dimension never before a part of the human fabric. We now must look at a situation where silicon chips can contain memory, in the sense of storing data in a form that can be retrieved and manipulated. This has blurred the distinction between organic and inorganic matter. Where is the dividing point between the cortex of the brain and the tool that can be structured to perform complex tasks of analysis using data from a 'memory' bank?<sup>39</sup> Philosophers have taken up the challenge of dealing with techno-culture in advance of the religious community. They have started to seriously debate the issue of the distinction between "who" and "what," that is the cortex and the tool. Some have come to the conclusion that the human and the organized inorganic matter are developing each other without either being the origin of the other. In other words, this school of thought is saying that the "what" invents the "who" as much as the "who" invents the "what." The cortex of the brain and the tools of technology are both objects of the study of the evolution of the relation between matter and the human. The "difference" between them is no longer seen as so precise and easily identified.<sup>40</sup> We are faced with the fact the human organizes inorganic matter and makes a tool or a computer and that tool changes them and their culture. The old division of an opposition of organic and inorganic matter is now "in doubt." Can technic be differentiated from thought? Do computers and digital tools intertwine with the human to the degree that we can begin to speak of a "technical consciousness" that is new to humanity? Is the language of the computer producing shifts in thinking and ways of operating in the world that mark a major change in the culture of the human race? Philosophers such as Stiegler have said that doubts about the origin of human culture or life itself must be guarded.<sup>41</sup> What we can do, he says, is to construct a history of the doubts. The doubts are related to the evolution of the relationship between matter and the human. When inorganic matter is "organized" as in the case of silicon and the digital age, then it has a history. As we study the history, we begin to have doubts about the clear opposition of organic and inorganic organized matter. Some have used the expression "zoo-technology" to describe the "doubt" about this opposition between human and material. Everyday ordinary life is filled with virtual reality. We view images, write messages, communicate over great distances, do our banking with digital machines, have operations where the surgeon looks at a screen rather than the patient, and all of it is "virtual" a display based on electron constructs. At every turn we see the need for an ethic that addresses the virtual. We have identity theft, viruses that are planted to destroy our data, "spam" that destroys a part of privacy, and a host of other negative acts that are new and have yet to fully identified or controlled.

Humanistic Buddhism must be fully involved in the ordinary culture of the digital age. We need to follow the procedure mentioned above of training and testing as necessities of cultural transmission. There is a need to determine how to train the new generation to handle the digital and virtual world. As one of the largest religious communities in the world, Buddhism must help address the ethical and cultural issues of the new tools that are becoming dominant in the ordinary life of people.

I gave warning that I would not finally define culture and I have not done so. Humanistic Buddhism has the stated goal of responding to human needs and problems. All of these human needs, problems, and acts are in some complex ways involved in culture. If this is the case, then Humanistic Buddhism will forever be tied to cultural matters. This conference is one way of stating how important it is for Buddhists to keep their attention trained on ordinary mundane life, that is, to be concentrated on how we live and act. It is in this way that Buddhism and culture can interact for the enhancement of human life.

## Endnotes

<sup>6</sup> See *Histories* by Herodotus. Translated by John M. Marincola and Aubrey De Selincourt. New York: Barnes & Noble Classics, 2004.

<sup>7</sup> Ruth Benedict, *The Chrysanthemum and the Sword* (Cambridge, Mass., 1946).

<sup>8</sup> Alex Inkeles, *National Character: A Psycho-social Perspective* (New Brunswick, N.J., 1997).

<sup>9</sup> Daniel Silverfarb, Britain's Informal Empire in the Middle East: A Case Study of Iraq 1929-41. (London. Oxford 1977).

<sup>10</sup> See http://www.koryosaram.freent.kz/ for a bibliography and some full text articles on this topic.

<sup>11</sup>Tom Tobback "Victims of geopolitics: the North Korean refugees in China" M.A. School of Oriental and African Studies, University of London, 2001 (Digital full text available tomtobback.tripod.com/SOAS/korea.doc)

<sup>12</sup> B.L. Kroeber and C. Kluckhohn. "Culture : A Critical Review of Concepts and Definitions" Cambridge Papers of the Peabody Museum of American Archeology and Ethnology, Harvard University, Vol XLVII, No. 1, 1952, pp 41-79

<sup>13</sup> Matthew Arnold. Literature and Dogma: An Essay towards a Better Apprehension of the Bible. London: Smith, Elder, 1873

<sup>14</sup> Tony Ballantyne. Orientalism and Race: Aryanism in the British Empire. New York: Palgrave Macmillan. 2002.

<sup>15</sup> Dirks, Nicholas B., ed. Colonialism and Culture. Ann Arbor: U of Michigan Press, 1992.
<sup>16</sup> Adam, Peter. *The Art of the Third Reich*. New York: Harry N. Abrams, Inc., Publishers, 1992.

<sup>17</sup> Ronald G. Suny, <u>The Soviet Experiment: Russia, The USSR and The Successor States</u>. (New York: Oxford University Press, 1998). See also Peter Kenez, <u>A History of the Soviet Union</u> from the Beginning to the End (New York: Cambridge University Press, 1999) for a discussion of propaganda.

<sup>18</sup> Dittmer, Lowell. *Ethics and rhetoric of the Chinese Cultural Revolution*. Studies in Chinese Terminology; No. 19. Berkeley: Center for Chinese Studies, Institute of East Asian Studies, University of California, 1981.

<sup>19</sup> Example of this is shown in detail in Tom Koch. Cartographies of Disease: Maps, Mapping, and Medicine. Riverside: ESRI Press, 2005.

<sup>20</sup> Henry Glassie, *Material Culture*. Bloomington, Indiana: Indiana University Press, 1999.
William B. Hesseltine, "The Challenge of the Artifact," in Thomas Schlereth, *Material Culture Studies in America*. (Robert Blair St. George, *Material Life in America*, 1600-1860. Boston: Northeastern University Press, 1988.)

<sup>&</sup>lt;sup>1</sup> www.ecai.org

<sup>&</sup>lt;sup>2</sup> http://www.languagehat.com/archives/000398.php

<sup>&</sup>lt;sup>3</sup> http://www.timemap.net/index.php?option=com content&task=view&id=19&Itemid=166

<sup>&</sup>lt;sup>4</sup> http://www.mmi.unimaas.nl/people/Veltman/books/Augmented%20Knowledge%20Intro.pdf <sup>5</sup> http://www.mmi.unimaas.nl/people/Veltman/articles/sums/New%20Media%20and%20Transf ormations%20in%20Knowledge.html

<sup>21</sup> Hirsch, E. 1995. Introduction – Landscape: Between Place and Space. In Hirsch, E. & O'Hanlon, M. (eds.). *The Anthropologyof Landscape. Perspectives on Place and Space*, Clarendon Press. Oxford. pp. 1–30.

<sup>22</sup> Edward B. Tylor, "The Science of Culture," in his Primitive Culture, pp. 1-9

[1871]. Reprinted in Herbert Applebaum (ed.), *Perspectives in Cultural Anthropology*, pp. 47-59 (SUNY Press, 1987).

<sup>23</sup> See http://www.yale.edu/hraf/userguides.html for the most comprehensive listing of cultural features including those of the 1938 project.

<sup>24</sup> See G. W. Stocking, Jr.'s Franz Boas Reader: Shaping of American Anthropology, 1883– 1911 (1982)

<sup>25</sup> Ruth Benedict, *Patterns of Culture* New York: Houghton Mifflin, 1934

<sup>26</sup> See another approach based on the idea of cultural evolution in Leslie A. White *The Evolution of Culture; The Development of Civilization to the Fall of Rome.* New York: McGraw Hill. 1959

<sup>27</sup> Raymond Williams "Culture is Ordinary." In Ann Gray and Jim McGuigan (Eds.), Studies in Culture: An Introductory Reader. London: Arnold, 1997, pp. 5-14.

<sup>28</sup> John H. Bodley, "An Anthropological Perspective" from Cultural Anthropology: Tribes, *States, and Global System.* New York: McGraw-Hill Higher Education, 3<sup>rd</sup> Edition 2000.

<sup>29</sup> John Seely Brown, Allan Collins, and Paul Duguid. "Culture of Learning". *Educational Researcher*. V18 N1 pp. 32-42, Jan-Feb 1989.

<sup>30</sup> See http://www.wsu.edu:8001/vcwsu/commons/topics/culture/values-beliefs/religion/relioussystems.html for a detailed discussion of this issue. <sup>31</sup> Miller, D. 1008, Interduction, Will

<sup>31</sup> Miller, D. 1998. Introduction: Why some things matter. In Miller, D. (ed.). *Material cultures* - *Why some things matter*, University College London Press. London. pp. 3–21.

<sup>32</sup> Michael Shanks, "Post-processual Archaeology and After" Forthcoming. Now online at http://www.libraryreference.org/index.php?c=Science/Social\_Sciences/Anthropology/Cultural\_Anthropology

<sup>33</sup> Godelier, M. The mental and the material: thought economyand society. Verso. London, 1988.

<sup>34</sup> Miller, D. & Tilley, C. 1996. Editorial. Journal of Material CultureVol. 1, No. 1, pp. 5–14.

<sup>35</sup> Margaret T. Hodgen. "The Doctrine of Survivals: The History of an Idea." American Anthropologist 1931 vol. 33 (3) 307-324.

<sup>36</sup> Richard Dawkins The Selfish Gene Oxford University Press. 1976.

<sup>37</sup> Binford, L. 1962. Archaeology as anthropology. American Antiquity 11, pp. 217–225.

<sup>38</sup> I am using this expression to include man-made objects, even though it was first used for "found" objects in nature. See B. Nagy and G. Claus, in U. Columbo and G.D. Hobson, eds., *Advances in Organic Geochemistry* (Pergamon, New York)., 1962 for the early use of the concept.

<sup>39</sup> For an example of how advanced some of this research has become, see J.P. Lazzaro and J. Wawrzynek "Speech Recognition experiments with silicon auditory models" in T. S. Lande (ed) *Neuromorphic systems engineering: neural networks in silicon* Boston: Kluwer Academia, 1998.

<sup>40</sup> Ilya Prigogine and I Stengers, *The End of Certainty, Time, Chaos and the New Laws of Nature.* New York: The Free Press, 1997. Further discussion in volumes such as Lynn Margulis, Dorion Sagan, *Acquiring Genomes: A Theory of the Origins of Species*, Persus Books, 2002.

<sup>41</sup> Bernard Steigler, *Technics and Time, 1: The Fault of Epimetheus*, trans. Richard Beardsworth and George Collins (Stanford U. Press: Stanford, 1998).