

**"If there is nothing beyond the organic ...": Heredity and Culture
at the Boundaries of Anthropology in the Work of Alfred L.
Kroeber**

Maria E. Kronfeldner

Abstract

When, in turn-of-the-20th-century America, Alfred L. Kroeber continued the work of Franz Boas, in establishing anthropology as an academic discipline in the US, he defined culture as a phenomenon *sui generis*. For this he asked geneticists to enter into a coalition against hereditarian thoughts prevalent at that time in the US. To goal was to make room for anthropology as part of academia and distinct from other disciplines. To this end, he crossed the boundary to biology in order to build the boundary and developed the concept of culture in close connection to the concept of heredity: culture as *independent of* biological heredity (culture as *superorganic*) and, at the same time, culture *as* heredity of another sort. I will first summarize the shifting boundaries of anthropology at the beginning of the 20th century. I will then present Kroeber's ideas on culture and show how the changing landscape of concepts of heredity influenced his views. The historical case serves to derive two general conclusions: that the concept of culture can play different roles in explaining human existence; that genetics and the concept of hard inheritance did not have an unambiguous *unidirectional* historical effect on the vogue of hereditarianism at that time; on the contrary, it helped to establish culture in Kroeber's sense.

Keywords: culture concept, heredity, American anthropology, superorganic, hard inheritance

Submitted to **NTM Journal of the History of Science, Technology and Medicine**, March 27, 2008.

Introduction

“If there is nothing beyond the organic, let us quit our false and vain business and turn biologists....”¹ This is what anthropologist Alfred L. Kroeber (1876-1960) said in 1916 – a time when ideas about heredity changed a lot, when genetics established itself as an experimental science, when hereditarian thinking was gaining wide acceptance in the US, and – last but not least – when American anthropology emancipated itself from being a museum-based profession and became an academic discipline. In face of all this, Kroeber, who was a student of Franz Boas, was fighting for the boundaries and the autonomy of the new academic discipline, named anthropology, and within this for the boundaries and the autonomy of *cultural* anthropology, in face of physical anthropology. Not very surprisingly, this struggle included a severe opposition to certain kinds of hereditarian thinking, and it re-instantiated the divide between the ‘two cultures’ of science (natural sciences versus humanities, roughly) within the field of anthropology.

Kroeber tried to accomplish his boundary work by focusing on a concept of culture that not only saves man from being ‘just another animal’ but gives cultural anthropology a distinctive phenomenon for study. According to him, culture is defined as not only *independent* but also *analogous* to biological heredity. Kroeber used the biologist's own concept of heredity to claim autonomy from them; and he stressed that the rise of a Weismannian, non-Lamarckian concept of inheritance, today often called ‘hard inheritance,’ and the correspondent denial of ‘soft inheritance’ of acquired characteristics was *necessary* for the historical development of such a concept of culture.² To put it briefly: *Kroeber was building boundaries by crossing them.*

In other words, in times of disciplinary or field formation, other disciplines or fields, in this case mainly biology, serve as “both matrix and whetting stone,” as historian Ross claimed in general for the emergence of the social sciences in the US.³ This article can thus be taken as a case study on boundary work between

¹ Kroeber (1916b: 296).

² Kroeber himself did not use the terms hard or soft inheritance and today these terms are not always used in the same way. I will use them in the following sense: hard inheritance is what Weismann's concept of inheritance implied, while soft inheritance is the exact opposite, implying that the hereditary material is malleable at any time, as for instance in Lamarckian inheritance. The term ‘Lamarckian’ is today used in unison for the idea of inheritance of acquired characteristics, even though Lamarck was by far not the only one referring to this kind of inheritance. It was common knowledge of his time and even Darwin believed in it. See Zirkle (1946) on the history of the idea from the Greeks to Darwin. Ernst Mayr (1982) is often quoted as the one who introduced the terms of ‘soft’ and ‘hard’ inheritance. Cyril Darlington, however, used the term “hard heredity” already in 1959, as I learned from Jonathon Hodge (during the workshop “Heredity in the Century of the Gene” (Exeter, 2006). Yet, Darlington used the terms with a slightly different meaning (see Darlington 1959: 14, 54-56, and Appendix; compare Mayr 1982: 687).

³ Ross (2003: 211).

disciplines. At issue is a case of boundary work that has led, in the end, to a factual disunity: between biology and physical anthropology on the one hand, and cultural anthropology on the other hand.⁴

In face of this, the article also serves two further purposes: To illuminate the development and role of the concept of culture in this boundary work and to address the impact of the concept of hard inheritance on the development of hereditarian thought. This is important since some historians have acknowledged what Kroeber said about Lamarckian soft inheritance of acquired characteristics.⁵ Yet, they did not relate it to the *development and role the concept of culture* had in the history of the social sciences; they did also not concentrate on the consequences of Kroeber's case for an historical account of the *impact of the concept of hard inheritance* on the formation of anthropology as an academic discipline, and of cultural anthropology as an autonomous field inside of it.⁶ In addition, while Tim Ingold, a contemporary anthropologist, criticizes Kroeber for being responsible for re-instantiating the two-culture divide in science and splitting man up into different compartments, this paper goes a step back. It first tries to *explain* what Kroeber exactly did, why he did so, and what we learn from his case.⁷

In *part 1*, I will say a little bit more on the shifting boundaries of anthropology at the beginning of the 20th century. This makes clear why Kroeber needed an opposition to hereditarian thinking. I will then analyze in *part 2* how Kroeber used a Weismannian or non-Lamarckian concept of hard inheritance to secure the boundaries of cultural anthropology. This shows why he wanted geneticists to enter into a coalition with him in order to oppose hereditarians. I will end, in *part 3*, with some systematic conclusions on the concept of culture and on why Kroeber's case is important for writing the cultural history of heredity.⁸

⁴ Superficially physical and cultural anthropology are still held together as a 'sacred bundle.' See Segal & Yanagisako (2005) for a critical discussion on whether this makes sense.

⁵ See for instance Stocking (1968: 250-269); Harris (1968: 121); Peel (1971: 143-146); Freeman (1983: 34-50); Degler (1991: 96-100).

⁶ Thus, it is not surprising that a standard history of anthropology, such as Patterson (2001), can ignore Kroeber's reference to the concept of hard inheritance as important for his concept of culture. In turn, it is not surprising that Kroeber has been ignored in accounts of the impact of the concept of hard inheritance (as for instance in Paul 1995: 40-49) or in historical accounts of the history of hereditarian thoughts in general, as for instance in Ludmerer (1972). He is briefly mentioned by Kevles (1985).

⁷ See Ingold (2001). The critique is not new. Clifford Geertz (1966) already criticized a "stratigraphic" picture that assumes irreducible levels of biological, psychological and cultural (and social) layers in man. The critique has its own history and deserves separate treatment (historically and philosophically) that I hope to be able to deliver soon.

⁸ Although important, I totally left out a discussion of how the political and social dimension entered the need for boundary work, i. e. how industrialization, capitalism, imperialism, and the resulting social inequalities played a role in the formation of social sciences in general, and anthropology in particular. Many issues are involved, e.g. the heritage of imperialism in the social sciences, progressivism, democracy, the opening up of specialized higher education to the less educated classes as solution and symptom of industrialization, the regulatory control of behavior

1. The shifting boundaries of anthropology at the beginning of the 20th century

That sciences are organized into disciplines, or sub-disciplines, means that conceptual boundaries are constantly built and rebuilt: the space of ideas gets delineated into areas of autonomy and exclusive authority over problems. Since ages, anthropology has conventionally been defined as ‘the science of man.’ At the beginning of the 20th century, American anthropology was thought to comprise four parts: archaeology, linguistics, physical anthropology, and cultural anthropology (also called ethnology). At the same time, this four-field anthropology stopped being a mere museum based profession and became an academic discipline, with the usual outward signs this has: curricula, degrees, journals, disciplinary associations etc.⁹ Naturally, there was a need to define the boundaries of anthropology in the face of other academic disciplines and areas of research, such as psychology, biology in general, and genetics in particular. And this need was also a need to define the internal relationship between physical and cultural anthropology since these two fields had different affinities: the first tended towards natural sciences, the second towards humanities and the developing social sciences. This tension, created by the ‘two cultures’ of science, is felt in American so-called ‘four-field anthropology’ until today.¹⁰

Marginalizing physical anthropology

Franz Boas (1858-1942), founding figure of American academic anthropology, regarded physical anthropology as central to understanding the behavioural differences between groups of people: heredity, a phenomenon considered as part of physical anthropology, was for him one of *several* factors an anthropologist has to take into account in order to understand the development and behaviour of individuals. His student Alfred L. Kroeber was more radical. He tried to marginalize the field of physical anthropology. Kroeber grew up in a German-Jewish-American intellectual context in New York and received Columbia’s first PhD in anthropology in 1901, the ninth in the whole US. Immediately afterwards, he got a permanent position. His job was to build up a department of anthropology at the University of California, Berkeley. By 1907 he was an important figure in the discipline and counts until today as the most influential figure in the establishment of American anthropology after Boas.¹¹

involved in the ‘disciplining’ of man. I did so deliberately since it would by far exceed the space available here. Useful entry points for this are Porter & Ross (2003) or Patterson (2001).

⁹ For more on the history of anthropology before it became a scientific discipline and how it developed since then see: Darnell (1971, 1998), Hinsley (1981), Patterson (2001).

¹⁰ See Segal & Yanagisako 2005.

¹¹ See Bidney (1965) for a short review of his life and work, Steward (1973) for a book length one, containing a summary of the biography written by Kroeber’s wife Theodora Kroeber (1970); see also Thoresen (1975) on the establishment, financing, and development of academic anthropology in California. On the contested history of the four-field approach see Stocking (1988).

**** FIGURE_1 about here ****

For Kroeber, cultural anthropology was much more central; “the other parts were secondary and marginal and owed their significance to their contribution towards an understanding of culture history,” as the anthropologist David Bidney says in a review on Kroeber’s impact.¹² Consequently, Kroeber never contributed anything important to physical anthropology.

At the same time, others pulled in the exact opposite direction: they tried to marginalize cultural anthropology. This is the background why Kroeber talked about 'turning biologists'. The following example from the politics of science shall illustrate that anthropologists like Kroeber had quite concrete reasons to be afraid of losing their jobs. In other words, there was a practical or pragmatic pressure to secure the boundaries of anthropology by marginalizing physical anthropology and by opposing hereditarianism.

Representation in the scientific bureaucracy

Between 1916 and 1918, Boas and his students fought for their representation in America’s scientific bureaucracy. At issue were the posts for the *National Research Council’s* Committee on Anthropology. For historians of anthropology the story is well known. George E. Hale, the Director of the National Research Council, asked William H. Holmes (1846-1933), important figure in pre-Boasian American anthropology and defender of a racial interpretation of cultural differences, to organize the Committee on Anthropology. Holmes chose Aleš Hrdlička (1869-1943), who was a defender of physical anthropology as an independent discipline, to take the lead. The goal was to prevent that Boas and his students get control over the committee. Yet they could not totally ignore Boas. Holmes thus put Hrdlička, Boas, and Charles B. Davenport (1866-1944), geneticist and leader of the American eugenicist movement, on the list for the committee. Yet, Hale dropped Boas from the committee because of Boas’ anti-war activism. In April 1917, Madison Grant (1865-1938), a wealthy racist propagandist, who published his best-selling book on the “Passing of the Great Race” in 1916, offered money for the committee’s work in exchange of membership in it. In the end, the committee consisted of Holmes, Hrdlička, Grant, and Davenport. And it was Davenport, who had been selected by Hale in February 1918 to represent the interests of the Committee on Anthropology to the National Research Council’s Division of Medicine and Related Sciences.¹³ In a nutshell, a geneticist, who defended eugenic doctrines, came to represent anthropology in the

¹² Bidney (1965: 268).

¹³ Yet, they did not manage to act in concert. As historian Patterson (2001: 57) has put it: “Grant perceived correctly that Hrdlička only wanted his money, and Davenport realized that Hrdlička had no interest in his eugenic investigations.” Davenport, Grant, and others, then formed the Galton Society explicitly as an anthropological one in 1918, to oppose Boas and his students, even though none of the founding members were trained in the new departments of Anthropology, as Cravens (1978: 115f) stresses.

scientific bureaucracy of the National Research Council. And this was at a time when there were already *trained* anthropologists to do so.¹⁴

As the involvement of Holmes indicates already, the struggle for representation was coincident with the struggle for emancipation from the older generation of anthropologists such as Holmes, which were not trained as anthropologists and predominantly oriented towards a racial hereditarianism; and, last but not least, it was coincident with the general dominance of racism and eugenics in the US at that time. These are the three main contexts in which American cultural anthropologists formed for the first time a clear professional identity as *cultural* anthropologists.

That Kroeber perceived a danger in the various developments just mentioned (and wanted others to perceive such a danger) is also evident from the language of war and territory that he used: according to him, biology is a discipline that “forged its weapons, taught itself their use, conquered a territory, and stands forth a young giant of prowess”, in order to “annex the antiquated realm of history that lay adjacent.”¹⁵

Yet, in an astonishing twist, Kroeber used the *biologist's own concept of hard inheritance* to keep up the two oppositions, against the institutional hegemony of biologists and against the scientific hegemony of hereditarianism. According to the historian Stocking, he was the *only one* among social scientists, who realized that the concept of soft inheritance (i.e. inheritance of acquired characteristics) prevented the autonomy of anthropology and other social sciences.¹⁶

2. Alfred L. Kroeber's boundary work: culture and/as inheritance

Kroeber's boundary work for anthropology found its first peak with a couple of papers between 1915 and 1917, ending with his famous article on “The superorganic” (1917), which established cultural determinism as his major doctrine.

The psychic unity of man and the superorganic nature of culture

Already in 1910, Kroeber laid down the basic frame of his point of view on culture, heredity, and anthropology. His example was morality: according to him, morality is governed by an innate, instinctual moral sense. Yet, variations in moral behaviour between “civilized” and “uncivilized people” are due to different cultural influences and not due to innate differences in the alleged moral sense. In other words, *behavioural* differences do not imply that there are essential inborn *mental* differences between groups of people: to the contrary, one should assume

¹⁴ For more on this and the history of the Committee on Anthropology see in particular: Stocking (1968: 270-308), Cravens (1978: 89-120); Patterson (2001: 55-60).

¹⁵ Kroeber (1916a: 34).

¹⁶ Stocking (1968: 259).

a *psychic unity of mankind* and explain the behavioural differences by the influence of what Kroeber called *civilization, history, or culture*.¹⁷

From this assumption, Kroeber went on to describe culture as “outside of race and independent of the human body.”¹⁸ This means that culture determines, i.e. influences, culture (via behaviour), but it does not influence the body, at least not the innate racial basis of the respective behaviour, and vice versa. That culture influences and thus explains culture means that culture is for Kroeber a system or process *sui generis*. Culture is “superorganic”¹⁹ – ‘on top’, so to say, of organic matters, relying on “social inheritance or cultural transmission” instead of biological inheritance.²⁰

To understand his position clearly, the following points have to be taken into account: in his 1915 paper “Eighteen professions,” arguing for the autonomy of anthropology as a distinct discipline, Kroeber assured that the psychic unity of man is not a proved or disproved fact, but a necessary assumption for the “historian,” i.e., the anthropologist, since otherwise “his work becomes a vitiated mixture of history and biology”.²¹ Yet, at the same time, he acknowledges that history and biology are intertwined and that the degree of their contribution in the development of individuals cannot be tested.²² These two statements are not contradictory. On the contrary, the argument that culture is a process in its own right is compatible with Kroeber’s claim that the behaviour of *individuals* and their development is caused by multiple factors, culture being merely one of them. If, however, we look at *culture itself*, then we see that culture is independent of nature, i.e., a phenomenon that can only be explained by reference to pre-existing culture. It is from this *inter-individual*, almost *phylogenetic* perspective that culture always derives from previous culture, as a cell always derives from previous cells.

The second issue that might cause misunderstanding is the issue about holism: Kroeber's paper on culture as superorganic is often treated as defending a strong holistic conception of culture.²³ Even though I cannot decide this issue here, the following two points should be taken into account. First, although Kroeber believes that culture is maintained via individual mental states or individual actions, he also believes that “[c]ivilization is not mental action itself,” but rather “a body or stream of products of mental exercise”.²⁴ This is not pointing

¹⁷ This psychic unity does not exclude individual differences. It is an “identity of average” as he makes most clear in Kroeber (1917: 194-203).

¹⁸ Kroeber (1910: 446).

¹⁹ Kroeber (1916b, 1917). He took the term ‘superorganic’ from Spencer's *Principles of Sociology* (1876).

²⁰ Kroeber (1916c: 368).

²¹ Kroeber (1915: 285).

²² Kroeber (1915: 285).

²³ For a critique of the concept of the superorganic understood in a holistic manner, see Bidney (1944), Herskovits (1948); the discussion in Kaplan (1965) shows that the actual issue is methodological and epistemological and not ontological: it is an issue about the distinctive subject-matter of anthropology.

²⁴ Kroeber (1917: 189 and 192).

to an ontologically dubious *whole*; it is pointing to a causal inter-individual *lineage* of the effects of mental acts. In addition, although he sometimes wrote in 1917 and 1919 as if individuals are mere *passive* bearers of culture (implying that their properties do not determine culture and vice versa, i.e., culture does not determine the properties of individuals) and as if culture is a special ontological substance, he recanted from this in 1952. He admitted that culture as a whole is not a peculiar emergent entity or substance and that individuals are more important than he put it in 1917. His goal in 1917, he himself says in 1952, was to establish the recognition of culture as an “autonomous” system, independent of “biological explanation”.²⁵ My claim is that if the context of an opposition to hereditarianism is ignored, Kroeber’s claim about the superorganic nature (and its genesis) cannot properly be understood.²⁶ And it was this opposition that correlates with a denial of the Lamarckian principle of the *inheritance of acquired characteristics*.

Inheritance of acquired characteristics

In 1916, in a paper called “Inheritance by magic”, published in the *American Anthropologist*, Kroeber moved the denial of inheritance of acquired characteristics to the centre of his account. In order to do so, he referred to three important aspects of August Weismann’s (1834-1914) ideas on inheritance: first, that experiments failed to produce positive evidence for the inheritance of acquired characteristics; second, that all cases of evolution are explainable without reference to inheritance of acquired characteristics; third, that inheritance is ‘hard’: that the hereditary material is *not produced* by the organism, but *present* from the start, *continuously existing*, and *protected* against changes that occur in the somatic tissue. Acquired changes, i.e., changes to the somatic tissue of the organisms, are not heritable on this basis. In Kroeber’s words, Weismann’s “basic idea” was “that the hereditary substance is totally distinct from the organic body, and that therefore the fate of the individual cannot affect the race.”²⁷ In addition, Weismann’s concept of heredity meant that the germ plasm exists over time

²⁵ Kroeber (1952: 7, 22-3). Compare Kroeber & Kluckhohn (1952: 49), but without reference to Kroeber’s papers between 1916-7, or Bidney (1965: 273).

²⁶ A point I originally took from Kuklick (2004). I thus depart from the conclusions drawn by anthropologists such as Bidney (1965), who derive from the failure of a total independence of culture from individuals that the concept of the superorganic did not make any sense. It did make sense, but only in a very specific way: namely, in the sense of a separate system of change and inheritance. Note that I use the term “system” or “process” to follow Kroeber with his late assertion that he does *not* regard culture as a “substance” (1952: 4, 22). With this I do not want to decide whether the ontological status of ‘culture’ has to be interpreted in a realistic or nominalistic manner. Do beauty or culture exist *in themselves* or do they merely exist in concrete beautiful things and culture bearing individuals? Either way one can ascertain that culture exists as an inter-individual process or system, a system of change and heredity. In a similar sense, we can say that evolution is a process or system of change that exists, even though individual organisms vanish, without regarding evolution as a special substance, an extra entity existing in addition to and in the same sense as evolving entities.

²⁷ Kroeber (1916a: 26).

independently of individuals. The germ plasm is thus sub-individual and inter-individual at the same time – almost as superorganic, i.e. independent of individuals, as Kroeber assumed culture to be. Kroeber also referred to Mendelism, the “new branch of biological science,” as providing a corroboration of this concept of hard inheritance. Thus he writes that although Mendelians perceive themselves as opposed to Darwinism, “one of their fundamental achievements has been the involuntary confirmation by real knowledge of an idea first clearly grasped by a Darwinian theorist.”²⁸

And yet, despite Weismann and despite Mendelism, the principle of the inheritance of acquired characteristics was still quite popular in the first 20 years of the 20th century. Because of this, Kroeber called his paper “Inheritance by magic,” asserting that “if found in the minds of uncivilized people,” the belief in the inheritance of acquired characteristics “would be described as belief in sympathetic magic.”²⁹ Kroeber thus asks the question *why* the people still believed in Lamarckian inheritance by using the conceptual toolkit of anthropology (magic, taboo, etc.).

In light of this frame, he cites two motivations for the belief in the inheritance of acquired characters: first, Lamarckian palaeontologists (as well as Mendelians) maintain that Darwinism cannot explain the origin of variation. Thus, in order to account for the origin of variation some scientists call the inheritance of acquired characteristics to the rescue.³⁰ Second, the general public and the social scientists stick to inheritance of acquired characteristics for another reason, as Kroeber states: they stick to it since they still do not distinguish between culture and race (synchronic perspective) and between cultural change and biological evolution (diachronic perspective) in a “*consistent*” manner. They confuse culture and nature.³¹

According to Kroeber, this confusion is caused by the assumption that cultural change, i.e. civilization, is *evidence for* and is *causally linked to* biological evolution. In Kroeber’s words, it arises from the assumption that “the acquisition of greater wealth or learning or skill by one group is evidence of a superior faculty for such acquisition inborn in that group through organic heredity.”³² This is what Kroeber calls the “fallacy that the social is organic.”³³ Those who “nominally” employ culture but regard it nonetheless as “ultimately, and in general directly, resolvable into organic factors,” are subject to this

²⁸ Kroeber (1916a: 27). Yet, he also acknowledges that the dismissal of inheritance of acquired characteristics does not rest on empirical proof. In some circles, Kroeber notes, it has even become a “taboo” (Kroeber 1916a: 28).

²⁹ Kroeber (1916a: 38).

³⁰ Yet, Kroeber believes that this is not a viable route for Mendelians, since if they move back to Lamarckian inheritance, they run into a severe tension. See Kroeber (1916a: 30)

³¹ Kroeber (1916a: 31). Compare Kroeber (1916b: 295; 1916c: 370; 1917: 163).

³² Kroeber (1916a: 33).

³³ Kroeber (1916a: 36).

fallacy.³⁴ And what makes this fallacy possible is, according to Kroeber, the belief in Lamarckian inheritance.

And indeed, take for instance Herbert Spencer (1855), at that time the most influential Lamarckian with respect to mental traits. He assumed that civilization is correlated with biological evolution. According to Spencer, civilization can *only* be explained by reference to Lamarckian inheritance, where ‘nurture’ becomes ‘nature’ in each generation, leading to innate differences between races.³⁵ New behavioural patterns become habits, which become instincts, via inheritance of acquired characteristics; these then play a role in the genesis of new behavioural patterns, which become habits, which then in turn become instincts, and so on. The explanation of the evolution of such mental abilities like intelligence, moral sense, or musical sense, is one of the reasons why Spencer opposed Weismann’s claims about the all-sufficiency of natural selection, which totally excluded inheritance of acquired characteristics.

As part of the well-known debate about the all-sufficiency of selection, Weismann had already answered that Spencer ignores that tradition is an alternative to his Lamarckian explanation. In an essay on music in animals and man, Weismann (1892) claimed that we *do not need* Lamarckian inheritance to explain the evolution of man’s capacities and achievements, if we admit that there is tradition. According to Weismann, Spencer and others confused *achievements* (culture or cultural change) with innate *abilities* (nature or biological evolution). They thus ignore that the first can change without the latter. One can read Weismann as saying: Spencer’s claim about the impossibility to explain certain innate abilities in Darwinian terms is irrelevant since these innate abilities exist only in the mind of the observer. Weismann illustrated his point with the following thought example: is it possible that there was a Mozart in Samoa, a person with a musical sense or innate ability equal to Mozart’s? According to Weismann, it would indeed be possible. But since the hypothetical “Samoaner Mozart” could not build on already accumulated musical traditions and the corresponding culturally transmitted abilities, it was not possible that the Samoaner Mozart expressed his high musical sense the way the real Mozart did. Kroeber acknowledged Weismann’s essay and heavily relied on it, but regarded it as “a brilliant miss,” since in the end, Weismann “hastened to the inconsequent conclusion that faculties are probably different after all.”³⁶

The relationship between inorganic, organic and superorganic change

It follows from Kroeber’s account that cultural evolution can proceed independently from biological evolution. Kroeber expressed this claim most clearly in the following figure 2:

³⁴ Kroeber (1916a: 37). -- The influence of Boas is evident, since it was Boas who first stressed that culture, language, and race (i.e., the genetic endowment of people) do not covary. See Boas (1894), or Boas (1911).

³⁵ See Richards (1987) and Gissis (2005) on Spencer.

³⁶ Kroeber (1916a: 37).

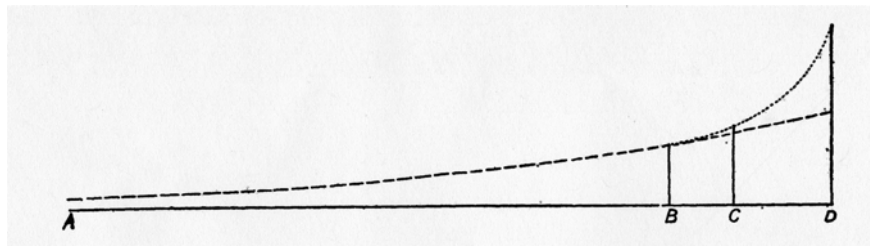


Figure 2_The relationship between inorganic, organic and superorganic change, from Kroeber (1917: 211): With this graph, Kroeber intended to illustrate his cultural determinism, in which culture or superorganic change (dotted line) is a form of heredity, changing in an analogous but autonomous manner to biological heredity and organic change (dashed line) and inorganic physical persistence (continuous line).

Kroeber presents the graph in order to stress that the lines, representing the three different systems of change (inorganic, organic, and superorganic) develop independently from each other. The important point is B, the first human that was able to learn socially from others; C would be the 'primitive' man and D the present moment.³⁷

With this, Kroeber opposed what I would like to call *racist hereditarianism*.³⁸ The latter regarded the synchronic and diachronic behavioural differences between groups of people as being *correlated with* and mainly *caused*

³⁷ Kroeber defined "[h]eight above the base" as "degree of *advancement*, whether that be complexity, heterogeneity, degree of coördination, or anything else" (Kroeber 1917: 211; Emph. added). A page later, he refers to the increase in number of cultural items and complexity of social organization as the things that distinguish us from the Neandertal people as example of the primitive man. The terms advancement or progress pop up here and there in 1917 and also in other papers. Despite these progressivistic wording, Kroeber tries to distance himself from progressivism by stressing: that "[n]othing is more erroneous than the wide-spread idea and oft-repeated statement that the savage is only a child" (Kroeber 1910: 445), a statement that directly leads to a critique of Darwin and like-minded thinkers who claim that the "savage is in a stage intermediate between the higher animals and ourselves." (ibid.) Kroeber also stresses that "[a]ll men are totally civilized" (Kroeber 1915: 286) and that he does not use the term civilization for "high" civilization, since for him it makes perfectly sense to talk about "Apache civilization" (Kroeber 1918: 355), which includes their language, their kinship systems, habits, religion, diet etc. – The just cited examples give a mixed message for the question whether Kroeber was still progressivist and thus less radical in terms of cultural relativism than his teacher Boas. A precise answer is, however, not central for the issues raised here, even if it is important in its own right; it has to wait for another occasion.

³⁸ Kroeber also opposed eugenics, for instance, in Kroeber (1916a: 34-37; 1916c: 370; 1917: 188-9). If eugenics is understood as Kroeber did, that is, in a narrow way as assuming that progress *cannot* be achieved by social reform (hereditarian eugenics), then it also ignores the possibility of long-term human betterment by cultural inheritance. If eugenics is understood to include Lamarckian points of view, then it reduces culture to environmental influence that is projected into the next generation via biological inheritance. Cooke (1998) suggests that eugenics was Lamarckian, a kind of 'soft' eugenics, before 1915 and predominantly hereditarian in the narrow sense afterwards.

by innate differences in ability to produce these cultural differences. Thus, greater wealth and power of one group of people can be correlated with and regarded as being due to higher innate intelligence. In a diachronic perspective, every cultural change (civilization) is then accompanied by a change in innate endowment. This is what Kroeber denies.³⁹ But note that, by assuming an inborn faculty of man for civilization and by assuming innate individual differences, Kroeber also subscribed to a hereditarian basis of human existence. He merely rejected its racist version.⁴⁰

In addition, by looking at culture in this manner, cultural inheritance – symbolized by the dotted line – emerges as the very process that makes culture ‘*superorganic*’. If civilization and biological evolution are as decoupled as Kroeber assumes, then culture becomes clearly visible as a separate, second *system of inheritance and change*. In the end, culture is conceived as being *independent of biological heredity* (culture as *superorganic*) and, at the same time, it is conceived as heredity of another sort.

Kroeber’s conceptual perspective is also reflected in his ethnographic practice. The papers we looked at so far are clearly programmatic without much reference to ethnographic data. Yet, when he writes, for instance, about the Indians of the Southwest in 1918, in a paper called “Heredity, Environment, and Civilization”, he shortly dismisses heredity and environment as factors to explain the “phenomena of group conduct or culture” (Kroeber 1918: 352). After introducing civilization as a third factor, he explains that the similarities and differences between different groups of people in the South West (Pueblo Indians, Navaho, Apache, Pima, Mohave, Luiseno, Gabrielino) can be described by singling out a “center of our area” and degrees of distance to that centre. This distance is identified not by physical differences of the people or by geographical differences in their habitats, but by cultural differences, which accumulate with increasing distance to the centre. The similarities between the groups are thus explained by diffusion from the centre. The partitioning of America in distinct areas is then done by so-called *culture areas*, which are isolated according to cultural differences, and not according to physical or geographic differences.⁴¹

³⁹ Kroeber does not say that he can empirically prove that he is right. He merely states that the others cannot prove that they are right. See for instance Kroeber (1916a: 34).

⁴⁰ Kroeber (1916a: 35). In Kroeber (1916a: 36 and 1917: 189-192) he therefore refers to Galton as being right in claiming that “between individuals mental faculties are inherited in the same ration and degree, and therefore presumably in the same manner, as physical traits [...] But it is an entirely unconvincing inference when he then proceeds to explain the diversity between the attainments of social groups such as ancient Athenians, modern Englishmen, Africans, and Australian natives, as due to differences between the average inherited faculties of the bodies of men carrying the civilizations of these social groups” (Kroeber 1916a: 35). “That heredity operates in the domain of mind as well as that of the body, is one thing; that therefore heredity is the mainspring of civilization, is an entirely different proposition, without any necessary connection, and certainly without any established connection, with the former conclusion” (Kroeber 1917: 192).

⁴¹ Although Kroeber did not invent the concept of culture areas, he counts, besides Clark Wissler, as the main influence in the development, use, and spread of this concept in the US. See Kroeber (1931) and Driver (1962).

The joining of hands across the gulf

Given that we can replace Lamarckian inheritance of acquired characteristics with social or cultural inheritance, Kroeber assumes that “[b]iology and history can join hands in alliance across the gulf that separates them.”⁴² From a close intertwining interaction of culture and nature in the concept of Lamarckian inheritance of acquired characteristics, we moved with Kroeber to a strict *separation of nature and culture* on the basis of the concept of hard inheritance. According to Kroeber, this conceptual separation should be linked to a disciplinary one: biologists should limit their study to biological heredity and the respective organic mental faculties and should leave the explanation of the superorganic culture to the historically working anthropologists. To return, where we started: *if* there is something superorganic, anthropologists do not have to turn into biologists. Instead, biologists are invited to “join them in a coöperative effort to establish the exact nature and the precise limits of the organic and the superorganic.”⁴³

In the end, Kroeber's plea for a coalition became true, for instance, when Thomas H. Morgan indeed joined in. Already in 1924, in a paper called “Human Inheritance,” and again in his “The Scientific Basis of Evolution,” he presents social evolution and its peculiar process of “inheritance” as *Ersatz* for Lamarckian inheritance of acquired characteristics, for which he sees no experimental evidence.⁴⁴ Social inheritance can be such an *Ersatz* precisely because it leads to the same effects, i.e. because it is functionally equivalent: efforts to change or to learn during one's lifetime are heritable and thus not pointless from an inter-generational, evolutionary point of view. Consequently, Morgan advocates the same interdisciplinary division of labour between geneticists and anthropologists Kroeber asked for.

3. Consequences for the concept of culture and the history of hereditarian thinking

Even if the concept of culture is still subject to controversial debates, not much has changed with respect to Kroeber's claim that culture is a system of change that is maintained via a distinctive inter-individual, trans-generational process of cultural inheritance. *In this sense* culture is even today conceived as a thing *sui generis*, as *autonomous*. Let me illustrate this last point in a systematic way by distinguishing between three roles the concept of culture has played up to the time of Kroeber's boundary work.

⁴² Kroeber (1916a: 39).

⁴³ Kroeber (1916b: 295).

⁴⁴ Morgan (1932: 187-217)

Three theoretical roles of the concept of culture

Without further historical argument, I want to claim that up to the 1920s, with respect to the dichotomy between culture and nature, there have been three major theoretical roles the anthropological concept of culture played in the explanation of behaviour:

- (C 1) Culture has often been understood as behavioural and symbolic patterns distinctive of a society. It has thus to be understood as an *explanandum*, something that is to be explained, by nature, environment, or culture, or all of them. I count Tylor's classic anthropological definition of culture as an exemplar of this category: "Culture or Civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and other capabilities and habits acquired by man as a member of a society."⁴⁵ This definition does not imply, as it is sometimes interpreted, that culture is explained by cultural inheritance in the sense Kroeber means it. The phrase 'acquired as a member of society' is ambiguous; it can mean 'acquired via social learning' but it does not have to. The phrase 'acquired as a member of a society' in Tylor's definition seem to bear no systematic role in his account and it can also be understood to simply refer to the fact that culture relates to a society of which the individual is a member, irrespective of *how* the respective cultural traits are acquired.
- (C 2) Franz Boas is well known to have initiated a first step in the decoupling of heredity and culture. He regarded culture as a more-or-less important *factor* in the generation of *behaviour of individuals*. Boas predominantly regards culture as a special kind of *environment*, a social environment that influences individual development. Culture thus becomes an *explanans*: culture helps explaining behaviour, but has to be distinguished from other factors, like race, in such an explanation of behaviour.⁴⁶
- (C 3) Kroeber went a decisive step further. He explicitly took *culture as a system of change and inheritance in its own right*, one that relies on social heritage. Culture thus becomes again an *explanandum*, but a new one. And although the early Kroeber thought that culture is also the only explanans for culture as explanandum (only culture explains culture), the late Kroeber admitted that many factors are involved in bringing about the inter-individual system of change and inheritance he called culture.⁴⁷

⁴⁵ Tylor (1871: 1). Nonetheless, it should be mentioned that Tylor, as does Kroeber, says that he considers questions of race as practically irrelevant for his goals (Tylor 1871: 7).

⁴⁶ See Stocking (1968: 212-220). My point holds even if Boas sometimes pointed to social learning as part of culture, since he did not treat cultural inheritance as a central aspect. To ignore the point that Boas treats culture predominantly as factor in the explanation of behavior leads to an identification of "cultural determinism" with "behavioural determinism" or "cultural determination of behavior", as Stocking does. This confuses the more radical sense 'culture explains culture' (cultural determinism) with the sense of 'culture explains behavior' (behavioural determinism).

⁴⁷ Nonetheless, Kroeber uses culture in the other two ways vis-a-vis the one he added. This is most evident in Kroeber (1918).

It is this last step that I wanted to stress, since it is usually ignored, e.g. even by Stocking, who is well-known for his work on the history of anthropology (especially on Boas, Kroeber, Lamarckism in social science, and the culture concept) and by Cravens and Degler, who are well known for their work on the history of hereditarian thought. Although Stocking, for instance, realizes that Kroeber radicalised Boas approach and further developed the concept of culture, he looks at the concept of culture through a Boasian lens and does not clearly distinguish the second and third way of using the concept of culture. He writes for instance that Boas' and Kroeber's concept of culture provided "a functionally equivalent substitute for the older idea of 'race temperament'. It explained all the same phenomena, but it did so in strictly non-biological terms, and indeed its full efficacy as an explanatory concept depended on the rejection of the inheritance of acquired characters."⁴⁸ This is misleading. Boas and Kroeber, first of all, did not have the same concept of culture, since in Kroeber's hands culture became a system of change and inheritance in its own right, while Boas strongly rejected the concept of culture as superorganic. Secondly, Kroeber's concept did not simply *explain the same phenomena*, since the concept of culture changed its theoretical role – from an explanans to an explanandum.⁴⁹

The distinction between the three theoretical roles of the culture concept is not only helpful to revise the history of the concept of culture. It is even helpful to understand contemporary debates about the relationship between culture and nature, given the disciplinary differentiation we have nowadays. First, Boas concept is the one that still dominates nature-nurture-debates in psychology and behavioural genetics. Kroeber's concept, however, is the one that is used in debates about man's place in nature and in those about the interaction between biological evolution and cultural change. In other words, the first is used in developmental contexts, the second in evolutionary contexts. Both contexts involve different questions of interactions.

In addition, some people still ignore Kroeber's concept. Evolutionary psychologists, for instance, reduce culture to a mere triggering condition of innately specified behavioural patterns. Cosmides and Tooby, thus, define culture as "any mental, behavioural, or material commonalities shared across individuals [...] regardless of why these commonalities exist".⁵⁰ Culture is here the

⁴⁸ Stocking (1968: 265). Cravens (1978) and Degler (1991) also use the term culture mainly for an environmental factor in the development of individuals. Degler comes close to my point, when he writes that Kroeber demanded "more than a mere change in assumptions as Boas had done; he was insisting upon a new mode of explanation for human behavior" (Degler 1991: 94). Freeman (1983) probably is closest to my point of view, but he does not distinguish between different roles of the culture concept.

⁴⁹ That Kroeber wanted to distinguish his concept of culture from Boas' is also evident from Kroeber & Kluckhohn (1952), a review of various definitions and concepts of culture, for which they became famous later on. In this they put Boas together with Tylor into the category of "descriptive" definitions using enumerations and Kroeber into this and into a second category of "historical" definitions: definitions with "emphasis on social heritage", even though the early papers of Kroeber at centre here are ignored in this review.

⁵⁰ Cosmides & Tooby (1992: 117).

explanandum, the specific attributes of a group of a people. It is not a *factor* in the explanation of what people do; it is the explanandum, the phenomenon to explain. At the same time, it is not an *explanandum in Kroeber's sense*. On the contrary, it is considered as merely 'evoked' through experience in the world. Thus, culture (mental, behavioural, or material commonalities) is basically innate. The influence of innately specified characteristics of mind is decisive and explanatorily central. The influences of the natural and social *environment* are mere triggering conditions.

Yet, the social environment is what others, dual-or-multiple-inheritance-theorists⁵¹ as well as 'standard social scientists,' call culture: a distinctive factor in the explanation of behaviour, that is, an explanans, and a special explanandum at the same time, namely a separate second system of inheritance of ideational units that can and needs to be studied in its own right. And this is exactly what Kroeber wanted to say – with the help of Weismann's concept of hard inheritance. And this is why I regard his case as historically and systematically important. In a way, Kroeber's case and the three different usages of the concept of culture offered above show that evolutionary psychologists ignore a century of debates on the concept of culture and 'atavistically' fall back to the 19th-century concept of culture, used by Tylor and long ago abandoned in anthropology.⁵²

With dual-or-multiple-inheritance-theorists the last argument (that evolutionary psychologists atavistically ignore the importance of the fact that culture is a second system of inheritance) can even be taken further and leads to a fourth theoretical role of the concept of culture. What Kroeber (almost altogether) ignores is that culture interacts with the biological system of inheritance not only at an ontogenetic, but also at a phylogenetic level, influencing thereby the distribution of genes in subsequent generations. He ends up with a phylogenetic-parallelist point of view, devoid of interaction at an evolutionary, i.e., phylogenetic level. Yet, contemporary multiple inheritance model, e.g. if they take niche construction seriously, take the last step – dialectically with and against Kroeber – back to a more interactionist view; they introduce a *fourth theoretical role of the culture concept*.

(C 4) Culture is a factor, an explanans, not only in the ontogenetic development of individuals but a factor in the *phylogenetic* process of (culture and nature interacting in) the evolution of organisms – that have a body, a mind and a culture. Niche construction and niche inheritance use culture exactly in that fourth sense. And we should not forget that already James M. Baldwin (1861-1934), and

⁵¹ Such as Cavalli-Sforza & Feldman (1981), Boyd & Richerson (1985), Durham (1991), Richerson & Boyd (2005), or Jablonka & Lamb (2005) and the niche construction theory of Odling-Smee, Laland & Feldman 2003.

⁵² A more detailed critique of evolutionary psychology along the lines of a history of the concept of culture can be found in Kronfeldner (forthcoming). Note that what I have said so far holds even though – from our contemporary perspective – we might question whether a *psychic* unity of man is justified, since mind or mental abilities are themselves developmental products of nature and nurture. No child is born with a ready-made mind. Culture would then start off from a mere *genetic* unity of mankind. This has been stressed by John Dupré (2004, 1993).

others at the beginning of the 20th century, made a similar usage of culture as a factor in the evolution of organisms.⁵³

The historical impact of the concept of hard inheritance

I will now drive home the second general point of this essay. What was the historical impact of Weismann's concept of hard inheritance on how the relationship between nature and culture was conceived? I want to defend the following three theses and I claim originality only for the last:

- (H 1) First, inheritance of acquired characteristics or soft inheritance in general allowed for *soft hereditarianism*. On the basis of soft inheritance, one could be a hereditarian and give culture a significant role to play in the evolutionary process, since the hereditary material itself was considered as being soft, that is, malleable by cultural or environmental influences. Culture, and that includes education and social reform, could play a role in evolutionary as well as developmental explanations without the need to refer to social or cultural inheritance.
- (H 2) Given Weismann's concept of hard inheritance, this possibility was gone. *As long as cultural inheritance is ignored*, hard inheritance leads to a *hard* hereditarianism, a picture where cultural and environmental influences cannot exert any influence on the evolutionary process and have thus also a secondary, less central influence on developmental processes. One could reduce explanations of organismic traits (be they physical or behavioural) to biological inheritance by combining the *continuity* of the germ plasm with the view that the germ plasm is the *sole* hereditary material transferred down the generations of individuals.⁵⁴

Both of these claims are more or less part of the received view on the impact of soft and hard inheritance. Yet the received view also takes it for granted that the concept of hard inheritance was therefore partly responsible for the vogue of *hard hereditarianism* – a view where nurture (natural environment and culture) does not play any explanatory role anymore. And indeed, at least until the end of World War I, geneticists as well as the general public predominantly believed in the power of biological inheritance to explain behavioural differences (within and between groups). At least, they usually did not say anything to the contrary.⁵⁵ This is why Bowler, for instance, writes that the “social consequences of biological

⁵³ The relationship between Baldwin, Boas and Kroeber would deserve close investigation here but has to wait for another occasion. Consult Simpson (1953) or Weber & Depew (2003) for more on the ‘Baldwin effect’.

⁵⁴ It was the latter, that has often wrongly been attributed to Weismann, as I have shown above.

⁵⁵ See Ludmerer (1972), Kevles (1985), Barker (1989), Paul (1995: 40-49). The concept of hard inheritance surely was not the only reason for the dominance of hereditarianism, but it is usually taken as one of the reasons. Part of the hereditarian bias might have been due to the growing scientific success of genetics as an experimental science in explaining biological heredity. Part of it might have been due to socio-political views, part of it due to institutional developments, as Cravens (1978) suggests. Usually, Johannsen is cited as an early exception to the rule of ‘geneticists were hereditarians’, and Morgan and Jennings as exceptions of the 20s, e.g. in Paul (1995: 115-117).

determinism” are not a product of social Darwinism or Darwinism as such, but a product of the rise of genetics, which “represents the collapse of a pre-Darwinian ‘developmental’ view of nature with consequences that were at least as profound as those associated with the initial conversion to evolutionism.”⁵⁶ – I depart from this received view by claiming that:

- (H 3) Since nothing in the concept of hard inheritance prevented one from acknowledging cultural inheritance, the connection between the concept of hard inheritance and biological determinism (or hard hereditarianism, choose your term) is neither necessary nor historically true, as the examples of Weismann and Kroeber show.

The concept of hard inheritance was thus not exclusively linked to hereditarianism, or, to put it in other words, the concept of hard inheritance did not have an unambiguous, unidirectional historical influence. To the contrary, it had an *important* historical impact on the rise of the concept of culture as a superorganic, separate *system of change and inheritance*: a concept of culture that helped to break the hereditarian consensus in the US of the early 20th century, that strongly relies on the idea of cultural inheritance, that thereby helped establish the boundaries of cultural anthropology, and did so by crossing the boundaries to biology. In the end, a new phenomenon was established, culture as a new explanandum, a phenomenon that needs its own academic approach for treatment, namely cultural anthropology.

Acknowledgements

Many thanks to David Depew, John Dupré, Moritz Epple, Snait Gissis, Eva Jablonka, John Jackson, Staffan Müller-Wille, Vida Pavesich, and Hans-Jörg Rheinberger. A first version of this paper has been published in the preprint series of the Max Planck Institute for the History of Science in Berlin (Preprint 343: Conference "A Cultural History of Heredity IV: Heredity in the Century of the Gene", 2008, pp. 61-76), by which this research has been funded.

References

- Barker, D. (1989). The biology of stupidity: Genetics, eugenics, and mental deficiency in the inter-war years. *British Journal for the History of Science*, 22(1), 347-375.
- Bidney, D. (1944). On the concept of culture and some cultural fallacies. *American Anthropologist*, 46, 30-44.

⁵⁶ Bowler (2003: 24).

- Bidney, D. (1965). The contribution of A. L. Kroeber to contemporary anthropology. *International Journal of Comparative Sociology*, 6, 266-277.
- Boas, F. (1894). Human faculty as determined by race. *Proceedings of the American Association for the Advancement of Science for the 43. Meeting*, 301-327.
- Boas, F. (1911). *The Mind of Primitive Man*. New York: Macmillan.
- Bowler, P. J. (1989). *The Mendelian Revolution: The Emergence of Hereditarian Concepts in Modern Science and Society*. Baltimore: John Hopkins Press.
- Bowler, P. J. (2003). *Evolution: The History of an Idea*. Berkeley: University of California Press.
- Boyd, R., & Richerson, P. J. (1985). *Culture and the Evolutionary Process*. Chicago: University of Chicago Press.
- Cavalli-Sforza, L., & Feldman, M. (1981). *Cultural Transmission and Evolution: A Quantitative Approach*. Princeton: Princeton University Press.
- Cooke, K. J. (1998). The limits of heredity: Nature and nurture in American eugenics before 1915. *Journal of the History of Biology*, 31, 263-278.
- Cosmides, L., & Tooby, J. (1992). The psychological foundations of culture. In J. H. Barkow & L. Cosmides & J. Tooby (Eds.), *The Adapted Mind: Evolutionary Psychology and the Generation of Culture* (pp. 19-136). Oxford: Oxford University Press.
- Cravens, H. (1978). *The Triumph of Evolution: American Scientists and the Heredity-Environment Controversy 1900-1941*. Baltimore: University of Pennsylvania Press.
- Darlington, C. B. (1959). *Darwin's Place in History*. Oxford: Basil Blackwell.
- Darnell, R. D. (1971). The professionalization of American anthropology: A case study in the sociology of knowledge. *Social Science Information*, 10, 83-103.
- Darnell, R. D. (1998). *And Along Came Boas: Continuity and Revolution in Americanist Anthropology*. Amsterdam: John Benjamins Publ. Company.
- Degler, C. N. (1991). *In Search of Human Nature: The Decline and Revival of Darwinism in American Social Thought*. New York and Oxford: Oxford University Press.
- Driver, H. E. (1962). *The Contribution of A. L. Kroeber to Culture Area Theory and Practice*. Baltimore: Waverly Press.
- Dupré, J. (2001). *Human Nature and the Limits of Science*. Oxford: Oxford University Press.
- Dupré, J. (2004). On human nature. *Journal of the Slovakian Academy of Sciences*, 13, 109-122.
- Durham, W. H. (1991). *Coevolution: Genes, Culture, and Human Diversity*. Stanford: Stanford University Press.
- Freeman, D. (1983). *Margaret Mead and Samoa: The Making and Unmaking of an Anthropological Myth*. Canberra: Australian National University Press.
- Clifford Geertz, "The Impact of the Concept of Culture on the Concept of Man" in *New Views of the Nature of Man*, ed. J. Platt (Chicago: University of Chicago Press, 1966), pp. 93-118.

- Gissis, S. B. (2005). Herbert Spencer's two editions of the *Principles of Psychology* 1855 and 1870/72: Biological heredity and cultural inheritance. In S. Mueller-Wille & H.-J. Rheinberger (Eds.), *A Cultural History of Heredity III: 19th century and Early 20th century*. Max Planck Institute's preprint series no. 294 (pp. 137-151).
- Harris, M. (1968). *The Rise of Anthropological Theory: A History of Theories of Culture*. London: Routledge.
- Herskovits, M. J. (1948). *Man and His Works: The Science of Cultural Anthropology*. New York: Knopf.
- Hinsley, C. (1981). *Savages and Scientists: The Smithsonian Institution and the Development of American Anthropology, 1846-1910*. Washington, D. C.: Smithsonian Institution Press.
- Ingold, T. (2001). From Complementarity to Obviation: On Dissolving the Boundaries between Social and Biological Anthropology, Archaeology, and Psychology. In S. Oyama & P. Griffiths & R. D. Gray (Eds.), *Cycles of Contingency: Developmental Systems and Evolution* (pp. 255-279). Cambridge, MA: MIT Press.
- Jablonka, E. & Lamb, M. 2005. *Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral, and Symbolic Variatin in the History of Life*. Cambridge, MA: MIT Press.
- Kaplan, D. (1965). The superorganic: Science or metaphysics. *American Anthropologist*, 67, 958-976.
- Kevles, D. J. (1985). *In the Name of Eugenics: Genetics and the Uses of Human Heredity*. New York: Knopf.
- Kroeber, A. L. (1910). The morals of uncivilized people. *American Anthropologist*, 12(3), 437-447.
- Kroeber, A. L. (1915). Eighteen professions. *American Anthropologist*, 17(3), 283-288.
- Kroeber, A. L. (1916a). Inheritance by magic. *American Anthropologist*, 18(1), 19-40.
- Kroeber, A. L. (1916b). Heredity without magic. *American Anthropologist*, 18(2), 294-296.
- Kroeber, A. L. (1916c). The cause of the belief in use inheritance. *The American Naturalist*, 50(594), 367-370.
- Kroeber, A. L. (1917). The Superorganic. *American Anthropologist*, 19(2), 163-213.
- Kroeber, A. L. (1918). Heredity, environment, and civilization: Attitude of the anthropologist toward race; work in his own special field traces back the history of man culturally and psychologically as response to civilization. *The American Museum Journal* 28(5), 351-9.
- Kroeber, A. L. (1919). On the principle of order in civilization as exemplified by changes of fashion. *American Anthropologist*, 21(3), 235-263.
- Kroeber, A. L. (1931). The Cultural Area and Age Area Concepts of Clark Wissler. In Rice, S. A. (ed.). *Methods in Social Science*. Chicago: University of Chicago Press (pp. 248-265).

- Kroeber, A. L. (1952). *The Nature of Culture*. Chicago and London: The University of Chicago Press.
- Kroeber, A. L., & Kluckhohn, C. (1952). *Culture: A Critical Review of Concepts and Definitions* (Vol. XLVII). Cambridge, MA: Peabody Museum.
- Kroeber, T. (1970). *Alfred Kroeber: A Personal Configuration*. Berkeley: University of California Press.
- Kronfeldner, M.E. (forthcoming). Trigger Me: Evolutionspsychologie, Genzentrismus, und die Idee der Kultur. to appear in: *Nach Feierabend: Zürcher Jahrbuch für Wissenschaftsgeschichte* 2009.
- Kuklick, H. (2004). Who owns the past? *Current Anthropology*, 45, 292-293.
- Ludmerer, K. M. (1972). *Genetics and American Society*. Baltimore and London: Johns Hopkins University Press.
- Mayr, E. (1982). *The Growth of Biological Thought: Diversity, Evolution, and Inheritance*. Cambridge, MA: Harvard University Press.
- Morgan, T. H. (1924). Human Inheritance. *The American Naturalist*, 58, 385-409.
- Morgan, T. H. (1932). *The Scientific Basis of Evolution*. London: Faber & Faber Limited.
- Odling-Smee, F.J., & Laland, K., & Feldman, M. (2003). *Niche Construction: The Neglected Process in Evolution*. Princeton: Princeton University Press.
- Patterson, T. C. (2001). *A Social History of Anthropology in the United States*. Oxford and New York: Berg.
- Paul, D. (1995). *Controlling Human Heredity: 1865 to the Present*. Atlantic Highlands: New Jersey: Humanities Press.
- Peel, J. D. Y. (1971). *Herbert Spencer: The Evolution of a Sociologist*. London: Heinemann.
- Richards, R. J. (1987). *Darwin and the Emergence of Evolutionary Theories of Mind and Behavior*. Chicago and London: University of Chicago Press.
- Richerson, P. J., & Boyd, R. (2005). *Not by Genes Alone: How Culture Transformed Human Evolution*. Chicago: University of Chicago Press.
- Ross, D. (2003). Changing contours of the social science disciplines. In T. M. Porter & D. Ross (Eds.), *The Cambridge History of Science: The Modern Social Sciences* (Vol. 7, pp. 205-237). Cambridge: Cambridge University Press.
- Segal, D. A., & Yanagisako, S. J. (2005). *Unwrapping the Sacred Bundle: Reflections on the Disciplining of Anthropology*. Durham and London: Duke University Press.
- Simpson, G. G. (1953). The Baldwin effect. *Evolution* 7, 110-117.
- Spencer, H. (1855). *Principles of Psychology* (1 ed.). London: Williams & Norgate.
- Spencer, H. (1876). *Principles of Sociology* (1 ed.). London: Williams & Norgate.
- Steward, J. H. (1973). *Alfred Kroeber*. New York and London: Columbia University Press.
- Stocking, G. W. (1968). *Race, Culture and Evolution: Essays in the History of Anthropology*. New York: Free Press.
- Stocking, G. W. (1988). Guardians of the Sacred Bundle: The American Anthropological Association and the Representation of Holistic

- Anthropology. In *Learned Societies and the Evolution of the Disciplines*. American Council of Learned Societies Occasional Paper No. 5, 17-25.
- Thoresen, T. H. (1975). Paying the piper and calling the tune: The beginnings of academic anthropology in California. *Journal of the History of the Behavioral Sciences*, 11, 257-275.
- Tylor, E. B. (1871). *Primitive Culture*. London: Murray.
- Weber, B. H., & Depew, D. J. (2003). *Evolution and Learning: The Baldwin Effect Reconsidered*. Cambridge, MA: MIT Press.
- Weismann, A. (1892). Gedanken über Musik bei Thieren und beim Menschen, *Aufsätze über Vererbung und verwandte biologische Fragen* (pp. 587-638). Jena: Gustav Fischer.
- Wolf, E. R. (1981). Alfred L. Kroeber. In S. Silverman (Ed.), *Totems and Teachers: Perspectives on the History of Anthropology* (pp. 34-55). New York: Columbia University Press.
- Zirkle, C. (1946). The early history of the idea of the inheritance of acquired characters and of pangenesis. *Transactions of the American Philosophical Society*, 35, 91-151.