

# THE ATTITUDE TOWARDS SCIENCE IN THE CHANGING PANORAMA OF ARCHAEOLOGICAL THEORY<sup>1</sup>

por

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**Abstract:** As archaeology becomes more scientific, archaeological theory has remained antithetical to the practice of science. Additionally, as more scholars and funding are poured into the archaeological science, theory will become an obsolete practice unless we find a way to reach a consensus and an understanding of how science can be integrated with other aspects of archaeology.

Part of the reason of this state-of-the-art is due to of theoretical influences in archaeology, which come from Continental Philosophy, a broad school of thought that developed largely as antithetical to science in specific, and to a crude and unrealistic view of “modernism” in general. This opposition to science and modernism has trapped scholars into a dialectic in which the pre-modern or pre-literate past (and present) societies are viewed in opposition to science and what is modern, but as anthropologists have come to recognize, this opposition makes little sense and obfuscates a richer and complex view of reality.

This paper suggests moving beyond this dialectic and understanding how and in what ways science can operate alongside other agendas, namely those that prioritize the practical and historical views of past reality.

**Keywords:** Science; Methodology; Modernism; Dialectics; Pluralism.

**Resumo:** À medida que a arqueologia se vai tornando mais científica, a arqueologia teórica tem se mantido antitética à prática da ciência. Com o crescimento da arqueologia científica, o estudo de teoria irá tornar-se obsoleta, a não ser que encontremos uma forma de chegar a um consenso e a uma compreensão de como a ciência pode ser integrada com outros aspectos da arqueologia.

Parte da razão por este estado da disciplina deve-se principalmente a influências teóricas em arqueologia que provêm uma escola de pensamento que se desenvolveu em grande parte como antitética à ciência em específico, e a uma visão grosseira e irrealista do “modernismo” em geral. Esta oposição à ciência e ao modernismo aprisionou os arqueólogos numa dialéctica em que o passado (e o presente) pré-moderno é visto em oposição à ciência e ao que é moderno, mas como os antropólogos têm vindo a reconhecer, esta oposição faz pouco sentido e ofusca uma visão muito mais rica e complexa da realidade.

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Este artigo sugere que se se tem de ir além desta dialéctica, para-se compreender como e de que forma a ciência pode funcionar lado a lado com outras agendas, nomeadamente as que dão prioridade às perspectivas práticas e históricas da realidade passada.

**Palavras-chave:** Ciência; Metodologia; Modernismo; Dialéctica; Pluralismo.

## 1. SETTING THE SCENE OF THEORY IN THE NEW MILLENNIUM

In the history of archaeological thought, perhaps the two greatest movements in the discipline occurred first in the mid-1960s onwards with New Archaeology (shortly thereafter called Processual archaeology) and from the 1980s onwards with Postprocessual archaeology. There is no point describing here what these movements were, since this paper is not really about these movements; it is however, about a much more subtle movement, one that might have an impact on archaeological theory, but that we are not discussing enough, and this movement is the Third Science Revolution (KRISTIANSEN, 2014). Unlike processual and postprocessual archaeology, this movement is not intellectual in the strict sense of the word, but it does affect the intellectual sphere of our discipline, perhaps in an even more impactful way than processual and postprocessual archaeology. The reason why the Third Science Revolution can impact archaeological thought is because it affects the very basis on which research is conducted — it affects how geographically widespread projects can become; it affects how much money is invested into archaeological research; it affects the popular perception of how archaeology can be performed; and ultimately, it affects how we think of archaeology in theoretical terms.

As argued Shanks and Tilley in the 1980s and 1990s, the way money is distributed, and the way university hierarchies are structured affect the way theory develops (1992). This is more true than ever: in many European countries, most scholars in archaeology can only obtain professorships when they demonstrably prove that they can obtain large-scale funding, such as through the European Research Council, which is Europe wide, or in Germany, through the Deutsches Forschung Gemeinschaft (German research foundation). It might not be immediately obvious how this would affect archaeological theory, but it will once we break down the changes in research in the new Millennium.

Now, in the most generalist of terms, research funding follows two paths: there is the high-risk, high reward and the low-risk, low-reward type of funding.

The former is best represented by the very type of research that is having crucial impact in the world today: the vaccine research for SARS-CoV-2 (Covid19). The research into an effective vaccine for Covid19 operated in the following manner — a public or private entity invests millions of euros into a vaccine by distributing those millions across several institutes, from universities to pharmacological companies. Naturally, it is very unlikely that all the institutes that received funding will produce a working vaccine that is safe and effective, which is why this type of funding is considered high-risk. But in the end, it is not a requirement that all institutes that received funding produce a working vaccine; in fact, all the investors need is one institute to be successful. As long as the investment produces one working vaccine, then there will be a return of investment and the funding will have justified itself. This is the high-reward that comes from the high-risk.

On the opposite side of the spectrum is research into archaeological projects. No matter how lofty one might think of archaeology, it can never produce high-reward results in the same way that medical research does. There is just nothing in archaeological research, no matter how spectacular, that will convince funding entities that justifies the same type of investment. Nevertheless, it does have a certain advantage over medical research; it is low-risk. What does low-risk mean in this context? Unlike medical research, which can produce negative results, such as when a vaccine is unusable, archaeology always produce positive results — it is very rare that an archaeological project produces a negative result. Even in cases, when hypotheses are tested and fail, the fact that the project managed to generate new data already means that it has been successful to a certain degree. Whereas research into a Covid19 vaccine has the aim of producing a final product that can be monetized, archaeological research follows a different ambition – publications that are (preferably) peer-reviewed and open-access.

Success in these large-scale projects is measured in terms of publications and the easiest and safest way to guarantee a steady stream of publications is by generating new data, preferably through scientific techniques. There are several reasons why science, understood here as the natural sciences, have been favoured when it comes to both funding entities and institutes who perform the research. One reason is because of the universality of scientific methods; while studying the material culture of Southern Iberian Bronze Age is, of course, very interesting and relevant, it remains only so to those who work specifically with the Bronze Age in Iberia. However, research into isotopes or radiocarbon dates is universal; it can be performed in Australia, in Japan, in Europe, in Latin America, and so on. Isotope research can also be applied to practically all periods, except those that are very recent or very old (well beyond the 40k BP mark). Given this situation, it

makes sense that researchers are now gradually leaning towards the use of natural scientific techniques since it has a higher chance of guaranteeing job stability; if there are no jobs modelling radiocarbon dates in Europe, one can always migrate to Asia, Australia, or the Americas. On the other hand, a person who researches the Bronze Age in Southwest Iberia, will always depend on the job market in the regions where the Bronze Age of Southwest Iberia is relevant, namely Portugal and Spain. Another reason why science has been favoured in large-scale funding has to do with publication strategies. Not long ago, the metric by which we measured the success of research was exclusively quantitative; that is to say, the researcher with most publications was considered successful. But much has changed since those days, largely because researchers have found ingenious ways of multiplying publications without necessarily increasing the workload. Thus, indexes measuring impact factor were created to see how much of an ‘impact’ a researcher has in the scientific community. Publishing in journals such as *Nature* and *Science* was unheard of not too long ago in archaeology (although it would happen from time to time), but nowadays, archaeology is a mainstay in these journals, in fact, in the same way that obtaining large-scale funding is considered an important estimation of success, the same goes for publishing in *Nature*. Once again, science has attracted archaeology researchers because it provides the illusion of universality — by publishing side to side with chemists, physicists, and mathematicians, it demonstrates that archaeology is just as scientific as these other disciplines. In the process, funding entities are happy to see their investment translated into papers in journals such as *Nature* and *Science*. Finally, the reason why science has gotten such a foothold in archaeology is because it is through science that archaeologists can now generate the most amount of data. Compared with geological coring, with geomagnetics, with isotope analysis, and aDNA analysis, which are very expensive but can be very fast, archaeological excavation is a morose investment that oftentimes also ends up being just as expensive. Science allows for Fast and Big Research (CUNNINGHAM & MACEACHERN, 2016; RIBEIRO, 2019). Excavation projects can take decades and, more often than not, excavations do not reveal the data one is expecting. Furthermore, an excavation rarely produces knowledge that might be of international relevance. On the other side of things, Big Data research, such as summed calibrated radiocarbon date distributions, can be applied across vast regions and cover several thousand years (e.g., SHENNAN *et al.*, 2013).

This is what archaeological research looks like in the new Millennium. Is there anything wrong with conducting research in this manner? Not at all. Much on the contrary; it is great that archaeology is now in the possession of this type

of funding. If the success of a discipline is measured by funding, it feels safe to say that archaeology is now considerably more successful than anthropology, ethnography, or history. But this rise of the sciences might have been a bit too quick and theory has not found a way to deal with this new research paradigm. It is perhaps time to sit down, engage in some slow science, and see what theory can do in this brave new world.

## **2. MORE WAYS OF THINKING ABOUT THEORY**

The third science revolution has changed the discipline and with it, it must ultimately change the ways we think about theory. It is, to put it in very dramatic terms, a situation of adapting or perishing. If the advance of science marches successfully on, theory will become irrelevant. We can hope for a second coming of postmodern critique, but as David Harvey explained, postmodernism was the outcome of postwar economic factors (1989) that are unlikely to occur again so soon. Theory would not disappear with a bang of course; it would disappear with a whimper. Without funding, those who believe that theory is an interesting pursuit will find themselves in a difficult position to juggle their time between reading tomes written by the likes of Deleuze, Latour, and Giddens and time dedicated to understanding the intricacies of aDNA, isotopes, and Bayesian modelling. Additionally, newcomers to the discipline, those who will try their hardest to achieve an academic position, will recognize that theory is not a path worth pursuing since there is no funding and no jobs associated to it. The academics who do obtain large-scale funding, will do so successfully through the practice of archaeological science, and they will have the means to hire PhDs and Postdocs who are specialized in the archaeological sciences. Students will be aware of this and will naturally weave their ways into the sciences and into the good graces of these academics, in order to have a career after their studies. Universities, which have gradually become corporatized, will not be seen as centres of learning; they will be seen as places where one can acquire a product, the product being a degree that enables students to go up the social class ladder. As a product, students can pick and choose the courses they believe will provide them the greatest chances of climbing the ladder. In archaeology, these courses will be in the archaeological sciences. Theory, with all its heavy books and abstract knowledge, will figure low in the list of courses a student will consider. With no funding and lack of students, universities will reconsider whether it makes sense to keep theory courses going.

Why not wait until the professor of theory retires and replace them with a professor in archaeogenetics? As time goes on, the archaeological theorists at universities will be seen as relics of a forgotten time, holding on to thinkers of previous centuries, unable to accept that the future is one made for science.

Naturally, the future does not need to be this dramatic, but for theory to have any say in the discipline requires us to realize different goals for theory. Here, we must recognize the way philosophical traditions have affected archaeology. With some exceptions, archaeological theory has largely been inspired by Continental European philosophy. For instance, in tracing the influences on postprocessual archaeology, Thomas Patterson highlights the role of Roland Barthes, Pierre Bourdieu, Paul Ricoeur, Michel Foucault, Jürgen Habermas, Louis Althusser, and Karl Marx, all of which are Continental European (1989: 556). Granted, many thinkers that served as inspiration to postprocessual archaeology were not Continental European thinkers: Robin Collingwood, Anthony Giddens, and Clifford Geertz come to mind. Nevertheless, the inspiration remains largely continental. If we add to these the thinkers who are currently inspiring posthumanist approaches we have: Bruno Latour, Gilles Deleuze, and Martin Heidegger. Once again, some non-Continental thinkers can be referenced: Graham Harman, Jane Bennett, and Manuel DeLanda. But even these latter scholars can be said to base their work on Continental thinkers (Harman's work is based on Heidegger, Bennett's is based on Deleuze, as is Delanda's).

American philosophy is virtually absent from archaeological theory. With the exception of Charles Sander Peirce, seen in the work for instance of Robert Preucel (2006) and Zoe Crossland (2009), American philosophy remains largely marginalized. This is not a discussion about the differences and/or similarities between Continental Philosophy and Analytic Anglophone philosophy, but trends that underlie both these philosophical traditions. Unlike Continental Philosophy, American philosophy has never found itself at odds with the natural sciences. In fact, in North America, much of the philosophy is conducted side by side with the sciences. A classic example is the naturalism of Daniel Dennett (2010 [1969]) and John Searle (1983). Another example can be found in metaphysics, which is developed to a large extent with classic mechanical physics and quantum physics in mind (e.g., ALBERT, 2000; LEWIS, 1986; MAUDLIN, 2012). This is not to say that all philosophy in North America is developed with science in mind, but North American philosophers simply do not see science as the antithesis of philosophy. In North America, philosophy and the sciences go hand in hand (PUTNAM, 2012). The same cannot be said of Continental Philosophy, where philosophy not only largely ignores the sciences, it oftentimes takes it to task to critique the sciences

(BRASSIER, 2014). Has this not been the role played by postprocessual archaeology? Has this not been the task of the posthumanisms? Of posthumanist thinkers that inspire archaeology, I cannot recognize one that has aimed towards bridging posthumanist thought with the sciences, much on the contrary, Bruno Latour is infamous for being anti-science, despite protestations to the contrary (1999: 1ff.) and Graham Harman disregards what he calls ‘scientism’ in favour of metaphorical allusions (BRASSIER, 2014: 418). Traditionally, in Continental European philosophy, science is considered its own distinct object, completely separate from philosophy, and in some radical cases something that should be disdained.

This, in turn, has generated an archaeological theory that sees itself as the antithesis of science, with Kristian Kristiansen, the prophet of the third science revolution, recognizing previous iterations of theory (i.e., postprocessual archaeology) as unnecessary in the future (CHILTON, 2014; KRISTIENSEN, 2014: 11, 24-5). This does not come as surprising and Kristiansen is not necessarily wrong in dismissing some of the more antiquated modes of doing theory — theory does have to move on from just criticizing science. The best example of the uneasy relation between science and theory can be seen in aDNA research. The attitudes towards aDNA by those who conduct theoretical research are three: it is amazing (e.g., KRISTIENSEN, 2014), it is the devil incarnate (e.g., CRELLIN & HARRIS, 2020; FRIEMANN & HOFFMAN, 2019; HAKENBECK, 2019), and it is neither amazing nor the devil, but rather a tool that we must learn how to use (e.g., ENSOR, 2021). As several archaeologists have pointed out, the first papers on aDNA are riddled with inconsistencies (ION, 2017; LIDÉN & ERIKSSON, 2013), which is to be expected from a new sub-discipline going through an “awkward adolescence” (KILLICK, 2015), but I do not believe these inconsistencies are representative of the advantages that aDNA can bring to archaeology. Once again, this does not mean an uncritical acceptance of aDNA, much on the contrary, it is precisely here where theorists should be putting their effort: in what ways can theory bridge aDNA with the more traditional practices of doing archaeology?

On a more personal note, my own work has been clearly unscientific, but that is primarily due to my training, which was one focused on the humanities. I have just always personally preferred history, literature, and philosophy. Yet nevertheless, in writing, I have always tried to leave the door to the sciences open. I have never believed that my theoretical work served as a replacement for science, but rather, as something that can be performed in accordance with the sciences. A philosopher who made an impact on me was Michael Oakeshott. In his book “Experience and its Modes” (2015 [1933]), Oakeshott discusses three ways in which we can experience

reality: the scientific, the practical, and the historical. In very broad terms, I also believe that archaeology, being the interdisciplinary practice that it is, can and should experience the past in those three modes. Naturally, with no training in the sciences, I can only develop an archaeology that focuses on the practical and the historical. On this front, I have worked on developing a concise understanding of intentionality in archaeology (2018a), that reveals the practical engagements people performed in the past; on similar note, my thesis was a development of a distinct mode experiencing the past in terms of a historical *Verstehen* (2018b). These ideas do reveal some of the limitations of science and its causal methodology when it comes to the past, but they highlight the limitations only in order to identify how the scientific mode of doing archaeology can be supplemented.

Much of the theory in archaeology today does not have this aim, because of its Continental roots. Rather, much of archaeological theory today seems hellbent in denying the role of science in archaeology. Not only is this attitude rash; it is outright risky — no matter how cogent a theory might be, the constant criticism and rejection of science makes theorists look insufferable, as people who are simply jealous for not making it in the big leagues. In fact, to be honest, not only do theorists who reject science sound insufferable to some, to the vast majority of archaeological practitioners, they are just ignored. Why would the archaeological scientist not ignore the theorist? If the vast majority of theory that engages with archaeological science are complaints about it, why would any archaeological scientist give a damn? The attitude of rejection of science that led to the “science wars” during postmodern times (SOKAL & BRICMONT, 1998) is very much alive today, and just like how scientists ignored the postmodern critique of science, they are doing the same exact same thing today in archaeology. This does not mean that scientists, such as the geneticists working on aDNA, are ignoring archaeologists *tout-court*; they are happy to collaborate with those who have a more moderate view of science. This balance is, however, an uneasy one, and this balance requires some discussion.

### 3. DIALECTICAL TRAPS

The critique of science comes in many flavours in archaeology, sometimes it pertains to how science is simply reiterating old ideas under the guise of objectivity (SØRENSEN, 2017), how it generates differential access to funding (GONZÁLEZ-RUIBAL, 2014; RIBEIRO, 2019), or how it subsists on an outdated

Cartesian framework (CRELLIN & HARRIS, 2020). This last type of critique is the one that carries the strongest theoretical baggage and the one I want to discuss in most detail.

The posthumanist critique of science comes off as somewhat strange considering that science has its own posthuman agenda. As Raymond Tallis points out (2011), one of the greatest critiques of the idea of man as ontologically distinct, comes from scientists who, in recent years, have gone out of their way to point out how humans are nothing more than apes. There is nothing in humanity that makes us morally superior to any other animal. Scientists have also argued for a deep-ecological movement which in turn, has translated into veganist, ecological thinking, and animal protection movements. Additionally, in the field of biogenetics we are witnessing the gradual dissolution of human and animal and seeing the rise of something that is “more-than-human”, a being that combines animal, human, and cybernetic aspects (ŽIŽEK, 2014: 6). Finally, one of the most radical posthumanists, Quentin Meillassoux has argued against all forms of post-Kantian philosophy (including Deleuzian, Latourian, and Heideggerian), in favour of infinity — the only true aspect of reality that is not accessible through human thought but can be represented through the only discipline that can represent infinity: Mathematics (MEILLASSOUX, 2008).

The affinity between posthumanist ideas and the sciences should make them natural allies (RIBEIRO, 2021) but posthumanism, as a Continental product, remains stuck in an old-school mentality that the sciences must be rejected. As Terry Eagleton has pointed out, despite the fact that posthumanism and the sciences are operating under the label of materialism, posthumanism remains nonetheless a form of poststructuralism in wolf’s clothing (2016: 11), and as poststructuralism, it remains critical of science.

As the theoretical founder of the (scientific) method, it is Descartes and his dualisms where most of critique ends up. Once again, this comes off as strange, considering that many of the ideas that serve as foundation to the posthumanisms can be found in the work of Descartes (ŽIŽEK, 2012: 625ff.). Additionally, the dualisms that the posthumanists repudiate (HARRIS & CIPOLLA, 2017) can be found in their own work. Granted, the posthumanists have managed to ingeniously weave their way around Cartesian dualisms, but they find themselves lost amid a bunch of Kantian dualisms, such as that which separates the Immanent and the Transcendental, which can be found in the work of Gilles Deleuze (BRYANT, 2008) and that which separates the Noumenal and Phenomenal, as can be seen in the work of Graham Harman (2016). Lost in this critique of Cartesian dualisms are countless other philosophers, which one would have a hard time describing as

Cartesian, the most important of which are Friedrich Hegel and Ludwig Wittgenstein. In fact, one aspect of Hegel's philosophy was precisely his anti-dualistic stance (PIPPIN, 2008: 46) and, as to Wittgenstein, he remains alongside Heidegger as one of the central voices against the dualism of mind and body (ARPONEN & RIBEIRO, 2014). Sadly, none of these two brilliant thinkers can be found in the posthumanist literature and their critiques of dualisms remains ignored.

But as the argument goes, dualisms are just the tip of the iceberg since what is at stake are not just dualisms but the very modernist thinking that dualisms inspire. As the spiritual successor to postmodernism, many posthumanist ideas recognize modernism as a package, which, among other things, includes colonial thinking, androcentrism, the western notion of individual, the notion of progress, and, of course, scientific objectivity. Naturally, any archaeology that displays any of these ideas can be dismissed, and aDNA research, by displaying many of these features should also be dismissed (see discussion in BRÜCK, 2021). But this dismissal of all things modernist has triggered a dialectical trap.

Dialectics has been a part of the theoretical toolkit of archaeology for many years (ANGELBECK, 2019; CRUMLEY, 1987; MARQUADT, 1992; MCGUIRE, 1993, 2008; SAITTA, 1995), yet surprisingly, despite being a product of Continental Europe, it has been picked up primarily by North American archaeologists. What is a dialectical trap? By negating something, you are also accepting it as something real and letting it dictate your life, or in the case of the posthumanists, your research. A brief contemporary example might help clarify things: imagine that at a party a person tells you that they do not listen to mainstream music. What this denotes is that this person knows what mainstream music is (which artists and which songs), acknowledges mainstream as its own actual category, and this person lets mainstream dictate what music to hear. As Adorno argued many years ago, perhaps the most pervasive form of dialectics is that of negation (1973). A good part of archaeological theory today is now caught in a negative process of negating anything modern, and with it, archaeological science. But the negation of science does not in itself create new knowledge; what it does is simply generate the opposite of science.

A careful reading of Latour's "We have been Modern" (1993) is necessary. You see, Latour was remarkably smart because he knew that he could have been caught in the same dialectical trap. By negating modernism, Latour would just become another postmodern, especially because he uses the dialectical mode of argumentation in "We have never been Modern". However, rather than negating modernism, much like how some people negate mainstream music, Latour denies the existence of modernism altogether and thus, there is nothing to negate, and

consequently, we arrive at the conclusion that we have never been modern in the first place. Clearly, this does not mean that there was no historical period we call 'Modern'. This historical period did exist, and the historical events of this period, such as those that happened in Europe, like the Enlightenment, the French Revolution, etc. also did exist. But this period and these events do not constitute their own reality that is disconnected from other periods or, in the case of Modern Europe, other parts of the world; they are just part of history and negating this part of history, is to reify it and give it way more importance than it actually had.

So, what happens when you negate modernism (which includes science, and objectivity, and individuality, and dualisms)? You get two opposing sets of ideas that exclude each other, where both are caricatured to the point of misrepresenting reality. The classic example is the distinction between the western notion of individual, which is modernist, and the non-western notion of dividual, which is non-modernist (DUMONT, 1980; STRATHERN, 1988). The basis of dividuality was first conceived by Louis Dumont when he recognized the difficulties in using the concept of 'individual' when studying the hierarchical structures in India (1980). According to Dumont, personhood in India was determined by a hierarchy that did not exist in the west, where personhood was defined primarily through egalitarian terms. Given this situation Dumont created a Holistic (Indian) and Individualistic (Western) distinction. For similar reasons, Marilyn Strathern reached similar conclusions when it came to Melanesian personhood, where the concept of 'dividual' seemed considerably more accurate as it represented the more socio-centric and relational people of Melanesian society. While the difficulties encountered by Dumont and Strathern are understandable, the distinction between individual and dividual has not aged well (SMITH, 2012: 51). The reasons are simple: the idea of 'individual' as a universal concept of personhood for Western society is simply nonsense. As Smith explains (2012), the notion of individual can, in fact, be used to describe both Indian and Western societies, just as the notion of dividual.

This has not stopped archaeologists of falling into the dialectical trap: if the moderns define themselves as individuals, then by dialectical necessity, pre-moderns cannot be individuals, they must be the opposite of the individual, which are dividuals, or some other concept of personhood that denotes relationality. But how is the alleged "modern" notion of individual not relational as well? Take for example a doctrine originating in western scholarship, that of internal relations (MOORE, 1919). According to this doctrine, an internal relation refers to those terms which contains within itself the relation it denotes, such as the term 'wife'. The difference between saying a person's personal name, 'Mary' for instance, and 'wife' is that Mary can change her personal name and never stop being the person

she is, however, if a woman is married to a man, the only way that the term wife stops applying is by stop being a wife (i.e., getting divorced, changing her gender, becoming a widow, etc.). The argument is not that there is a universal notion of ‘individuality’, but rather, that the notion can be applied cross-culturally, yet will have sometimes subtle, sometimes radical meanings in different times and places (ENGLUND & LEACH, 2000: 228). Following a similar type of reasoning, modernism is not this static thing that reifies individuality, objectivity, androcentrism, and a colonialist mindset — it is more than anything a historical period with a remarkably diverse set of ideas (see ISRAEL, 2001, 2006, 2011), where not only something like individuality becomes very explicitly manifest (SIEDENTOP, 2014), but manifests only because of its dialectical opposite, which is relationality.

Ironically, this dialectical trap does the very opposite of what it aims, which is to understand pre-modern societies. Rather than trying to understand these societies in the best way and with as many tools as possible, including science, the attitude is to exoticize them by simply highlighting how non-modern they must have been. In anthropology, for instance, the more exotic and non-modern a society is, the better. The Amerindian societies studied by Viveiros de Castro are an excellent example of this practice (1998). Bear in mind that at no point is one denying that the Ameridians studied by Viveiros de Castro are not unique in their way of collapsing nature and culture and recognizing humanity in non-humans, but assuming that these societies represent the non-modern norm might be a bit ill-advised. A considerably “less interesting” pre-literate society are the Baining of New Guinea. According to Jane Fajans, some anthropologists have tried to study the Baining (1997) but given their lack of any beliefs or complex forms of culture or societal structure, anthropologists have avoided them. But it is perhaps their lack of cultural complexity that makes them interesting: unlike the Amerindians studied by Viveiros de Casto, the Baining believe that they are clearly distinct from other animals. Central to the Baining is the notion of ‘work’, something that the Baining wholeheartedly engage in and that animals do not. Despite the obvious economic differences from western societies, the Baining follow cultural ideas that would not sound exotic to a westerner at all, and given this situation, they are just one of the many pre-literate societies that are rarely mentioned. Only the exotic societies, those that represent the polar opposite of the imagined modernist western culture, deserve to be mentioned, because it is only through these that the past can be exoticized.

For the theorists who have fallen into the dialectical trap, science cannot help archaeology because it is assumed that science operates exclusively in dualistic, androcentric, colonialist, and individualist terms. To impose these features onto the past is an anachronistic act. This might be true, but can it not be argued that

imposing the opposite of science, that is to say, imposing a monistic, gender neutral, postcolonial, and relational view of the past is just as anachronistic? One way to solve this issue is precisely to recognize the role of science and what it can and cannot do. For instance, aDNA can help us understand prehistoric kinship systems, but not in the anthropological sense. It can help by clarifying how widespread exogamy networks were in certain regions (WAGNER, 1972) if the DNA signatures allow this. aDNA cannot, however, tell us other things about kinship, such as the transmission of name or how marriage alliances operated. In order to do this, all we have are educated speculations.

Theory, in the case of aDNA, can clarify some issues and can help overcome the dialectical trap by identifying a synthesis. For instance, when thinking about kinship, are we to assume that prehistoric people could not identify a woman as a ‘mother’? Despite the varied examples of how motherhood could have manifested in the past (BRÜCK, 2021; REBAY-SALISBURY *et al.*, 2018), to reject the notion of ‘mother’ in biological terms might be a little too extreme. As Vincent Descombes explains, pre-literate societies must have operated with some notion of individuality, not in the western liberal sense, but as a way of distinguishing one person from another, or a person from an animal (2014: 304). To deny this capacity is to assume that these people lived in permanent confusion; that they could not tell apart mother from tree, or child from tiger. Central to this capacity is another form of dialectics, one inherited from Hegel, that demonstrates that in order for there to be subjective personhood, there also has to be objective institutions (DESCOMBES, 2014: 270ff.). According to Hegel, any subjective perspective always relies on objective institutions, because without objectivity, the subjective would not be understandable. What this means in terms of kinship is that to understand complex subjective forms of motherhood, requires us understanding the objective biological process that creates mothers in the first place. It is this basic biological notion of ‘mother’ that serves as reference for other subjective manifestations of motherhood. Without the objective notion, the very concept of ‘mother’ would not be understandable. This is what staves off absolute relativism. Imagine a situation where the term ‘mother’ denotes the relation between the sunlight and farming or denotes the relation between the stomach and digestion – motherhood would then be about everything and nothing and it would, in the process, become a worthless field of research.

With regards to kinship, science cannot tell us that much about how it manifests subjectively, but it can lay the foundations on which we can then work on, in conjunction with anthropological analogy and funerary archaeology. But this will require a deep transformation of theory, one that does not see science as the antithesis of more theoretical approaches.

#### 4. THEORY OF SCIENCE

The rapprochement of theory and science is important for archaeological theory to survive in the long run. As explained in the first sections of this paper, since science has become such a strong determinant of how the discipline develops, there is no future in which theory can outfund science. This does not mean that theory should become subservient to science, much on the contrary, theory should remain the critical voice of archaeological practice (see NIKLASSON, 2014), and it should remain the arbiter of “bad science”. Obviously, it needs to be much more than this.

With this in mind, theory should maintain its rather eclectic nature, however, it might make sense for there to be an explicit theory of archaeological science. In a similar note to the work of Merilee Salmon (1978, 1993), there should be a recognition of what science can do for archaeology at a theoretical level, but this recognition should not become an uncritical praise of science. Above all, a theory of science in archaeology is a theory that highlights the domains in which science can operate and exactly what information is produced by science, which in the case of archaeology concerns aDNA, isotope analysis, Bayesian modelling, sum probability distributions, etc. It is only by knowing the exact limits of science that we can obtain a better picture of how these can be combined with other methodologies. Taking a page out of the philosophy of Michael Oakeshott (2015 [1933]) and George von Wright (1971), the aim of archaeology in the new Millennium should be methodological pluralism; an archaeology that complements each other through different methodologies.

This methodological pluralism would follow a scientific, a practical, and a historical agenda. The scientific agenda has already been outlined multiple times (e.g., KINTIGH *et al.*, 2014; KRISTIANSSEN, 2014), but the practical and historical have not. The practical agenda refers to what many years ago was the project of the human sciences (DILTHEY, 1985), but rather than a human science limited exclusively to hermeneutic methods, the human sciences should be understood through the german “*Geisteswissenschaften*”, that is to say, a science of morals<sup>3</sup>. This could be done with the set of ideas outlined in agency theory (e.g., DOBRES & ROBB, 2000) and practice theory (e.g., KIENLIN, 2020), although some work still needs to be done on this front. Of the three agendas, the historical one is probably the one that requires most work. Granted, archaeology as a historical

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<sup>3</sup> The term “*Geisteswissenschaften*” was first used extensively to translate John Stuart Mill’s “Moral Sciences”.

discipline was in fact theorized during the height of postprocessual archaeology (e.g., HODDER, 1987), but many ideas, such as those of Arthur C. Danto (2007), Carlo Ginzburg (1993), Walter Gallie (1964), William Dray (1957), and Siegfried Krakauer (1969) remain underappreciated.

Naturally, this trinity of agendas is not an overnight solution to much of the problems afflicting archaeology, but it is something to keep in mind as a constructive path. Furthermore, this does not mean that every theorist should devote their time to these agendas — there is much more to theory than science, practice, and history in archaeology. Nevertheless, this trinity could help — it can outline a path that is less antithetical to how archaeology seems to be developing.

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