An Archaeological Model and its Historical Setting

Assets of Different Situatednesses in Academic Teamwork

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Abstract

This article discusses an approach to teamwork between archaeology and history and how we analyse Georg Sarauw's model of the Stone Age world. The background of the model was Sarauw's investigation of the Mullerup site. We have focused on the complexity of how a model of prehistoric conditions relates to currents of the scholar's formative process.

Introduction

The Danish botanist/archaeologist Georg Sarauw's interpretation and publication of the Stone Age site of Mullerup, Zealand (Fig. 1) came to change the long discussion as to if there was a Mesolithic in the "Hiatus". While this is well known, it has been less recognized that his publication includes a model of the local Stone Age world (Sarauw 1903, *passim*). Our present reading shows that Sarauw constructed an evolutionary model of life in Mullerup, as well as an ontological divide between culture and nature. We will briefly connect to our previous analysis of his scientific practices in Mullerup (Holmberg & Hjørungdal 2016). In that article we presented a *material-semiotic methodology* of how we read Sarauw's archive record when we aimed to analyse scientific practices used during his excavation. Our concept that we, an archaeologist and a historian, practise historiographic analysis together, is a productive but infrequent approach to the history of archaeology. The aim of the present article is how to understand the Mullerup model of Stone Age life. Information on Mullerup is summarized in the box below. Next we outline how *relational realism* is fruitful to our method and the importance of scholars' different situatednesses in academia is explained. We introduce Georg Sarauw (1862–1928; Fig. 2), his formative period and specific situatedness. We present his archaeology with the Stone Age model at issue. We survey some of the scientific practices preceding his construction of the model (Sarauw 1900 and n.d.). We finish with some results and focus on the benefits of our approach so far.

Fig. 1. Location of the site Mullerup.

Fig. 2. Georg Sarauw 1862-1928. Photo from Stadsmuseet, Göteborg.

Mullerup, Western Zealand, was initially excavated and interpreted in 1900, and published in 1903. Later it was recognized as the first site in the "Hiatus", later established as the Mesolithic (*c.* 9000–4000 BC). Mullerup belongs to the Maglemose culture, the initial Mesolithic in Southern Scandinavia. Sites from this phase were usually located in a waterlogged and/or woody landscape. In modern times they were found in bogs, often discovered by extensive peat extraction for fuel in the 1800s and during the World Wars. This was also the case with Mullerup when the site was revealed through tiny, sharp flint tools – later on named *microliths* – that cut the hands and feet of the peat workers. Until Mullerup was conclusively interpreted and dated, the Mesolithic was only a term. It was first applied in the 1860s to a hypothetical period which was considered only due to knowledge of a preceding and succeeding period through archaeological finds. No finds from the proposed Mesolithic were known, and as a result this empty period was widely known as the "Hiatus". A few stray finds and some sites in France qualified for a probable date within this Hiatus, but the age of the objects could not be established (cf. Westropp 1872; Piette 1895; Niklasson 1955; Rowley-Conwy 1996).

The chronological state of Mullerup was the result of Georg Sarauw's systematic practices of measurement, comparisons and analyses. The site initiated knowledge of a new physical phase of the Stone Age. A number of minor excavations have been undertaken in the site over the years.

Problematizing academic cooperation

We started in the academic neighbourhood between archaeology and history but do not take the implication of closeness for granted. Nor is it taken for granted that we share sources; archives, printed texts, images, landscapes, maps, and things. On the contrary, as we possess different expertises, locations and voices within academia, our approaches to mutual sources are partly different as well. The nature – and potentials – of such differences is not explored. This paradox provoked our interest and we decided to approach academic cooperation between neighbours as an *issue of methodology*.

Regardless of shifting ideas about closeness/distance to history, archaeology has since its initial professionalization defined its methodological expertise in how to deal with materialities, while history has its long-standing skill in the written record (cf. Andrén 1997).

Our discussion was initiated by questions like: What is the benefit of cooperation? Why and how do we, archaeologist and historian, practise historiography of archaeology together, and in which locales?

We needed a framework for organizing a cooperation; more exactly how to deal with negotiations about scholars' different locations in academia, and how to meet. Inspiration is found in what Donna Haraway calls *situatedness*, and in what Joseph Rouse and adjoining scholars term *situated practices* (Haraway 1988; Rouse 1996; Mol 2002; Barad 2007). To expand on the issue of practices, we needed skilled procedures for how to read chosen archive sources together. We found the *verb-oriented method* (Berg *et al.* 2013), which we adjusted to a new context. In the previous article we presented how we diffracted traits of the method from Berg *et al.*'s reading of historical data bases into our reading of *handwritten archaeological archive material*. Primarily we share the motto *practices* with Berg *et al.*, but practices are specific to context and include multiple verbs characteristic of discipline and setting. An aim of the initial verb-oriented method was to study time-use, but our version has not included temporal aspects. Another deviation from Berg *et al.*'s version is that we widened our material to comprise photos and the practices and physical positions we think we could read out of them, whether photos were staged or not. A focus in our reading of Sarauw's reports was that verbs describe something about how a material object, an instrument or a trowel is used and how it interacts with the scholar, the soil, the site and the surroundings, how it assists and also how it can cause complications. This says briefly what we actually did together (Holmberg & Hjørungdal 2016).

Relational realism

When an archaeologist and a historian meet with the aim of developing methods of writing history of archaeology, it is an innovation. This fact is followed by some challenges. One of them concerns the nature and the practices of relationship; of how we approach each other as equal partners in scholarship and not as one another's preset authorities. Archaeology does not need to be in undisputed position of authority all through the process, despite the fact that it is a piece of this discipline's history we aim to write. Philosophical lines as to how relational scholarship can be practised have ancient roots and much in common with the version developed in the American sociologist Charles Tilly's *relational realism*, enlarging on where history meets sociology (Tilly 2008, 7). This is an approach also elucidated by the Swedish sociologist Boel Berner (2011). Like Tilly, Berner, however, refrains from elaborating on details in how

and where disciplines meet, and how they *practise* meetings. Recently new and different versions of relational realism have emerged and adjusted in many disciplines. Current versions are explicit on methodological tools, which add to their strength of spelling out more physical details about practices and meetings. We welcome a version elaborated by the physicist/philosopher Karen Barad, a line widely taken up. The essential factor is that she presents a method which is operative as well as being adjustable to new settings (Barad 2007). Elements from Barad's relational realism have already been *diffracted* (Barad's term for adjustment) into archaeology (e.g. Alberti *et al*. 2013; Fredengren 2013). The concept has been evaluated at length by Chris Fowler, who introduces a detailed version of relational realism in archaeology, exemplified by a particular prehistoric context (Fowler 2013). Archaeologists' readings and diffractions of Barad's approach are supportive to further archaeological discussions of relational realism.

With the theorists cited we also share the approach that science is ongoing patterns of situated activity whose material setting is part of practice (Haraway 1988; Rouse 1996; Mol 2002; Barad 2007). When the issue is cooperation, we also, like Haraway, share a link to the anthropologist Marilyn Strathern's approach of partial connections between companions (Strathern 1991; Haraway 2003), admitting that a complete "from above" overview of a scientific problem does not seem realistic. We recognize meetings as *encounters* that take place in limited and specified spatio-temporal locations. An encounter is situated and it is incongruous, and therefore can ensure the promises of discussions and result in something unexpected that is different from established lines.

Different situatednesses

Our situatednesses

Our line implies the recognition that the archaeologist is a specialist on prehistory, materiality and archaeological reports. *Qua archaeologists* we are hardly major experts on written tomes and sources of the streams of modern times, big ideologies, innovations and changes of the 1800s, the political and cultural circumstances under which academic archaeology was organized. A historian, in contrast, has a systematic education on the sources of modernity and on how to approach them source-critically, besides an education on standard works and their influences from/on interpretations of their specific historical epoch. Archaeology and history traditionally accumulated a confident, professional knowledge and authority on their respective skills. They are therefore disciplines with voices of their own: a good precondition for fruitful encounters.

Andrén was of course right in indicating that the relationship between thing and text will stay significant in the postmodern era (Andrén 1997, 149). With current post-anthropocentric lines such relations develop in complexity. This complexity attracts us and gives further support to our experimental line.

Before we started, we had to make clear the fact that co-reading implies mutual decisions about locations where our disciplines have the promise of making effective encounters and becoming operative together. On what criteria do we make choices like these?

As children of our own time we recognized that we, like our disciplines, are differently situated in academia, despite current sharing of physical premises: despite differences in time of employment in academia and being educated at different universities, and partly in different countries, we belong to the same generation but to different genders. Both of us have rather wide experience in non-academic

work, but have been keen on reading and learning and developed into academics as grown-ups. The archaeologist was educated in the 1970s at Bergen in a social-anthropological tradition of archaeology. She wrote her thesis at Lund, and spent four years at Umeå. She is specialized in Scandinavian prehistory, and has also taken up problematization of constructionism and aspects of critical and feminist post-humanist, material-semiotic approaches and examines how they can be prolific in archaeology. The historian was educated at Stockholm and Gothenburg. He took up traditions of critique of civilization in Europe during the 1800s and 1900s. He is further inspired by social constructionism and the history-of-concepts line. Fiction as a historical method has been a central concern. In this aspect, the historian experiences a new and fruitful encounter with Brandes in Sjöberg's cited book on Sarauw.

Our different situatednesses have been a qualification for lively discussions, for following up issues that at first glance might have looked uncooperative. It also permits both the historian and the archaeologist an internal as well as an external position. From this double location we have a fortunate perspective on zones of possible encounters. This position encourages our mutual approach to Georg Sarauw's specific situatedness.

A scholar in the hub – Georg Sarauw's situatedness

In the early 1800s Denmark experienced rapid economic and social transformations. Through various *land reforms* and agrarian innovations, farmers' conditions improved. Market orientation and urban influences gradually changed the traditional subsistence economy (Bjørn 1988, 9 ff.).

At the same time religious conditions acted against scientific innovations. In Denmark the renowned priest, writer and politician *Frederic Severin Grundtvig* (1783–1872) had his ideological advance through his profound theological conservatism combined with reform-minded ideas of public education. Grundtvig also affirmed a trend of reinforcing citizens' active part in political decision making, and he was a co-designer of the new constitution of 1849 which ended royal absolutism and replaced it by a parliamentary system (Trägårdh 1989, 36).

In this divergent environment, deeply affected by economic development, political liberalization and the Grundtvigian spiritual atmosphere, Georg Frederik Ludvig Sarauw (1862–1928) was born. Sarauw is primarily known for heading the Archaeological Museum in Gothenburg from the year 1912 (Sjöberg 2005). But his birthplace was in southern Zealand. He started at *Herlufsholms Lærde Skole* in Næstved, Zealand, at the age of 12. The school had a distinctly classical profile. He learned to master Hebrew, Greek and Latin, as well as German, French and English. Great talent, devotion and diligence were traits of the young pupil. He graduated in 1881 at the age of 19 with the highest marks (Sjöberg 2005, 19 ff.). From the beginning Sarauw probably planned to have a career within classics. As a student at the University of Copenhagen, however, he chose a different profile.

During the 1870s the Romantic ideals also began to be questioned, and in Denmark the critic and author Georg Brandes started a series of lectures *Hovedstrømninger i det 19. Aarhundredets Litteratur* (Main Tendencies in 19th-century literature), later released in six volumes (Brandes 1872–90). The lectures drew full houses and were given a lot of coverage in the press. Inspired by French Realism and Naturalism, Brandes argued that literature's role was to "put problems under debate". His harsh criticism of traditional authority made him deeply despised in conservative circles (Nolin 1965, 13 ff.; Beyer 1991). Brandes paved the way for the so-called *modern*

breakthrough (Sw. *Modernismens genombrott*) which characterized Scandinavian literature of the 1880s. In a broader sense the modern breakthrough meant a politically radical or liberal point of view, deeply sceptical of religion, metaphysical claims and established social conventions. Influences from Darwinian evolution grew more explicit, according to which Man was primarily a biological being, one among other species (Nolin 1965, 25, 29).

Writers of the 1880s, like the French naturalists, were strongly influenced by contemporary science. Like the scholar in a laboratory, they prepared their products through rigorous studies of the environments described. Close and intensive contacts grew between cultural personalities and scientists. According to his biographer Sjöberg, Sarauw during his student years in Copenhagen belonged to the Brandes' circle. It is reasonable to imagine that this strengthened his orientation towards a more pronounced scientific career. It was also a characteristic of the internationally minded Sarauw family to become learned people and to contribute to the improvement of social and political conditions (Sjöberg 2005, 15 f.).

Already in 1882, Sarauw took a bachelor's degree in philosophy, Egyptology and medicine. But in 1888, as his scientific interest prevailed, he earned the degree of *Forstkandidat* in Copenhagen, as his father had done 50 years before, but Georg never came to practise this profession. The next year he studied at the University of Munich, meteorology, botany, plant chemistry, and not least microscopy, later crucial to his analysis of Mullerup's boreal wood stubs. He combined his sciences with Babylonian and Assyrian literature and French and English, besides visiting museums to draw exhibited objects.

Sarauw then went to the University of Berlin to improve his knowledge of plant physiology and quaternary botany, before visiting the Sorbonne for plant anatomy and chemistry. Back in Copenhagen, he was employed at the university's department of Plant Physiology. A major work on symbiosis between fungi and forest trees was followed by articles on plants and animal species. In 1896, two years after joining *Nationalmuseet* (the Danish National Museum), he took his doctorate in natural sciences. It was under Sophus Müller's management that his career as an archaeologist began in earnest (Sjöberg 2005, 23 ff.). Sarauw came in because of his botanical competence.

By the 1890s, the problem-oriented, naturalist tendency in literature and cultural life was challenged by Neo-Romantic sensibilities. While homestead, nation and race became important concepts, emerging democratic mass movements, including striving for universal suffrage, gained ground but also met resistance. Neo-Conservative and Ultra-Nationalist movements with anti-Semitic and anti-democratic features spread across Europe (Bergsten, S. 1991, 25 ff.; 74 f.; Bergsten, G. 1991, 304 ff.; 374 ff.). Danish nationalism was affected by the 1864 Prussian war when Denmark lost the duchies of Schleswig-Holstein and Sønderjylland/ Nordschleswig. Questions about Denmark's origin increasingly grew in subtlety and made it highly infected (Jenkins 2011, 52 ff.). Archaeology, prehistoric monuments and the remote past were central references in the construction of a Danish nation (Klindt-Jensen 1975). Sarauw's formative decades enclosed a time of interesting and opposing currents in Denmark and Europe, and it is reasonable to assume that he was shaped by the tides and innovations he encountered at home and abroad.

Georg Sarauw and his Mullerup archaeology

Sarauw's Mullerup article exceeds 260 pages in the yearbooks of Nationalmuseet, Copenhagen, *Årbøger for Nordisk Oldkyndighed og Historie* (Sarauw 1903,

148–315). First he presents the geographical and topographical backgrounds to the bog and the site, the excavation and materials. In the outline of a local Stone Age world, it is important that Sarauw did not make any graphic model of the setting: the model is revealed in the organization of his text. A Stone Age Mullerup world is materialized according to four categories organized in four paragraphs: first a paragraph on the History of the Soils, then the History of the Plants, next the History of the Animals, and last follows the History of Humans and their tools (Table I). The species least visible in the find material as well as in Sarauw's text is paradoxically the human, physically represented by only a few fragmented bones in the soil (Sarauw 1903, 198). Animals, on the other hand, are present in abundance, as bone fragments and as tools of bones and antlers. Plant remains were recorded in the different bog layers. Most important were the stubs of pine (*Pinus silverstris L.*). Their presence in the Boreal layer stirred the botanist's idea about the ancient age of the site.

There is widespread discussion of how scholars' formation processes, spatio-temporal settings, concepts of the world, and interpretations are linked (e.g. Haraway 1988; in archaeology e.g. Conkey & Spector 1985). When we analysed Sarauw's procedures, model and setting, we asked how he – in companionship with archaeology – encountered other academic disciplines around 1900, and how this can be perceived in his record material and printed text (Sarauw 1903). In his case it was primarily botany which encountered archaeology and became co-actor on the path to a chronological conclusion. It is clear that he was backed by his comprehensive education in sciences in addition to his archaeological experience. Moreover he was generally well read and a man of the pen, experienced in writing letters and reports, and in employing an adequate scientific vocabulary. In his archive material on Mullerup, he demonstrates a long process of identifying, defining artefacts and stratigraphy as well as explaining his unanticipated finds to other scholars.

Since the mid 1800s, archaeology at the Danish National Museum had been organized with natural sciences, and had parted with the romantic tradition of aiming to verify archaeology by written sources. This was in the multi-scientific tradition of the *Køkkenmødding-kommissionen* (the Kitchen Midden Commission; Klindt-Jensen 1975; Kjærgaard 2006). In the commission archaeologists, zoologists, botanists and geologists cooperated with the aim of analysing these sites estimated to be Denmark's most ancient. This experience of cooperation is most important as Sarauw was employed in the midst of it. But Sarauw's formative years and wide experience are just as significant in perceiving how the cultural layer in Mullerup emerged through his approaches. One thing is that he was the only expert scholar at Mullerup, but with the well-qualified assistance of the teacher Mathiassen, and a few younger colleagues (Sarauw 1900), and the venerable zoologist Herluf Winge made the

Table I. Sarauw's implicit model: This is how we, from our location, read out Sarauw's lines of evolution in his textual depiction of Mullerup's setting. The construction of the table is ours and based on the organization of sections in Sarauw's article (1903, passim), and translated into English. The table's lowermost row is given in Sarauw's own original Danish words. It is read as a model of an ontological divide between Culture (Humans together with their tools) and Nature (soils, animals, plants).

History of the soils	**History of the plants**	**History of the animals**	**History of humans and of tools**
Jordlagenes Historie	Planternes Historie	Dyrenes Historie	Menneskets og Redskabernes Historie

post-field interpretations of animal bones and antlers (Sarauw 1903, 194 ff.).

Sarauw's multidisciplinary education made an important difference to the National Museum's established organization with specialists and their respective practices of fieldwork. Through natural sciences he was widely trained to appreciate the importance of the theodolite and the microscope during the process of recording and interpretation. He had the skills and experiences to observe archaeological conditions together with geological, botanical and zoological conditions. His combination of these skills provided a better overview of the conditions in the field and a better capability to interpret the profile as he sketched it down on paper (Fig. 3). When he decided to go abroad in search of objects from comparable regions he logically chose the Baltic regions because they obviously had shared the Ancylus Sea with Denmark. Abroad, in Königsberg he was presented with Baltic tools similar to those in Mullerup. His comparative studies thus made up another crucial step in his explanation procedure.

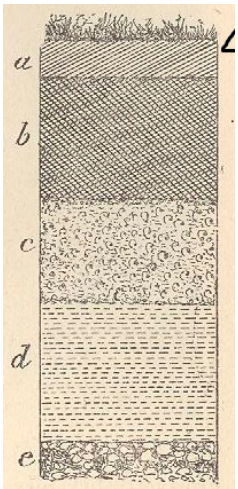


Fig. 4. Profil af mosens lag. *a* Græstørv, *b* Tørv, *c* Snegledynd, *d* Dynd, *e* Ler og sand med større eller mindre sten. 1/25. (VII E 2, se Tab. I, pag. 159).

Fig. 3. Sarauw's profile. From Sarauw 1903, 157, Fig. 4.

In a previous article we focused on how an archaeological conclusion was established through small steps of measurement, comparison, discarding and discussions. The start of this complex procedure was that Mathiassen observed flint tools beneath the Boreal pine stubs. We enlarged on a few practices of scientific looking and measuring following on that observation, e.g. *microscope practices* in Sarauw's studies of wood anatomy confirmed that pine was a key botanical indicator of the Boreal horizon as the prehistoric remains of pine were located directly above the crucial flint tools. Related was the practice of *levelling* by the use of a theodolite. A different class of practices were those of packing and labelling find material, important because Sarauw initiated an improvement: Particularly the bones were carefully packed and lined. Newspaper could not be used for wet items, and Sarauw ordered brown lining paper instead. He sent the finds by express train to Copenhagen (Holmberg & Hjørungdal 2016; cf. Sarauw 1900, and n.d.; cf. letter Fig. 4).

Sarauw had come upon a layer with prehistoric human-made tools, but with the flora and fauna of the Boreal chrono-zone, corresponding to the phase of the Ancylus Lake. This implied that Mullerup was older than the kitchen middens. In sum these were the wide-ranging outcomes of many encounters between practices in archaeology and other sciences together with Sarauw himself, his collaborators and his use of written terminology together with instruments. They were all of them different actants – and with different situations and voices, depending

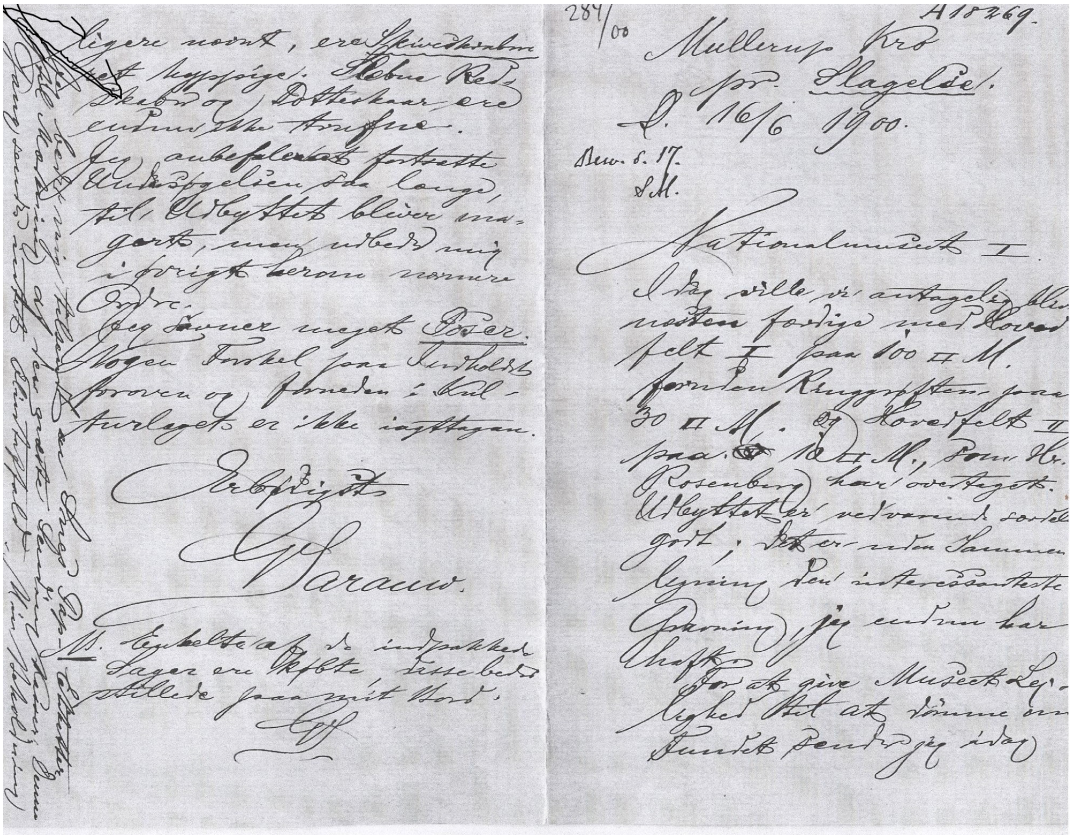


Fig. 4. From Sarauw's letter to Nationalmuseet on June 16, 1900. The letter is written at the inn Mullerup Kro, where he stayed during the investigation. Sarauw describes the excavations and finds, and calls for equipment to take care of the objects from Mullerup.

on things such as whether they were human or material actants – in a mutual process of making the new and unfamiliar conditions in the site reasonable.

Models of ancient settings are generally recognized among archaeologists as products typical of their modern contemporaneity. What we know less about is the particular scientific practices behind interpretive models of the past world. Material-semiotic studies of Sarauw's practices gave more details on relations between archaeology and innovative natural sciences and have supported our analysis of the Stone Age model. To discuss additional aspects of spatio-temporal influence we need to connect to some of the big ideas of Sarauw's time.

Encounters and outcomes in Sarauw's setting

Darwinism is certainly of interest to Sarauw's formative time. With its empirical base and its systematically structured laws of evolution, Darwinism provided a teleological narrative that made life manageable. Towards the end of the 1800s it became a kind of super-ideology, visible within the most diverse political camps. Among contemporary defenders of Imperialism and Colonialism, white supremacy could be argued on purely biological grounds. Radical groups were attracted primarily by Darwinism's critical attitude toward religion: human destiny was not subject to any divine order. Instead

skills in modern science were focused on as preconditions for a more egalitarian society. Although Sarauw, as far as we know, rarely spoke on purely political matters he was probably closer to the radical interpretation. He was not only Danish, but a cosmopolitan, mastered foreign languages and moved freely across national borders, cultural and academic spheres. His international orientation probably contributed to his never being attracted to racial biology. Sarauw's own relationship to Darwin is discussed broadly in Sjöberg's biography, which concludes that Sarauw was an empiricist rather than a theorist.

Our analysis reinforces the complexity of Sarauw's attitude. He set up a chronology of strong evolutionary traits in the Mullerup model. His notion of the various stages of the Stone Age was partly based on tools characteristic of an epoch where technological advances were awarded a crucial role in the different phases (Sjöberg 2005, 287 ff.). This was the general approach in terms of understanding prehistoric changes and development. The notion of a stepped development was also taken up by social theorists. According to one of the most notable among them, Karl Marx, the level of technological development was crucial to the definition of different historical stages. By all accounts there are no direct references to Marx in Sarauw's texts, but strong parallels are seen between them in a few respects. Faith in the impact of material conditions on culture is found in both of them, as well as the perception of an irreversible process towards more complex social formations. Altogether Sarauw apparently was influenced by Darwinism, but a system like Darwinism cannot be applied indiscriminately to a Stone Age context. On this background we state that Sarauw's mode of linking human evolution with the typology of tools in addition shares properties with Marx's idea about the value of work as the single basis of social evolution (cf. Marx 1973 [1894], 722). It is the Mullerup model's sharp distinction between, on the one hand, the soil (together with plants and animals), and on the other, humans and their tools, that makes this statement reasonable.

We suppose there are ideas and thinking behind all kinds of visible academic practices. But in archive material and printed texts we more often meet with what scholars *have done* during their research processes. In this respect we are aware that field reports are a source category in which we have the best of opportunities to find materialities of thoughts and ideas. Also, according to methodological lines developed by Haraway and Barad, it is significant to take account of the fact that thinking and learning actually take place in our material bodies and that thinking is related to, as well as being a force in the production of different materialities (Haraway 1988; Barad 2007, 208; Fowler 2013; Jensen 2012). Through diffractions of big histories of how humans and their surroundings developed, Sarauw was able to tell a history of development in a local context. We concluded that the model implicit in his Mullerup article is a phenomenon that emerged from archaeology's encounter with tensions of evolutionary thinking combined with the ideas of technical progress and the means of production (tools and natural resources) in cooperation with humans. Models (of prehistory) are not only thought up, but also have a background in practices achieved relationally between scholars, materiality, instruments, and language (cf. Barad 2007; Fowler 2013, 41). On a more general level we have demonstrated a characteristic example of Barad's notion of diffraction: that Sarauw implicitly used his approach to a current scientific idea he was familiar with and transformed and adjusted aspects of it to suit a context of which he himself already was a practising companion. Sarauw's notion of evolution has far from any one-to-one relation to big ideas about development.

Interpretation of Sarauw's model of the world in Mullerup

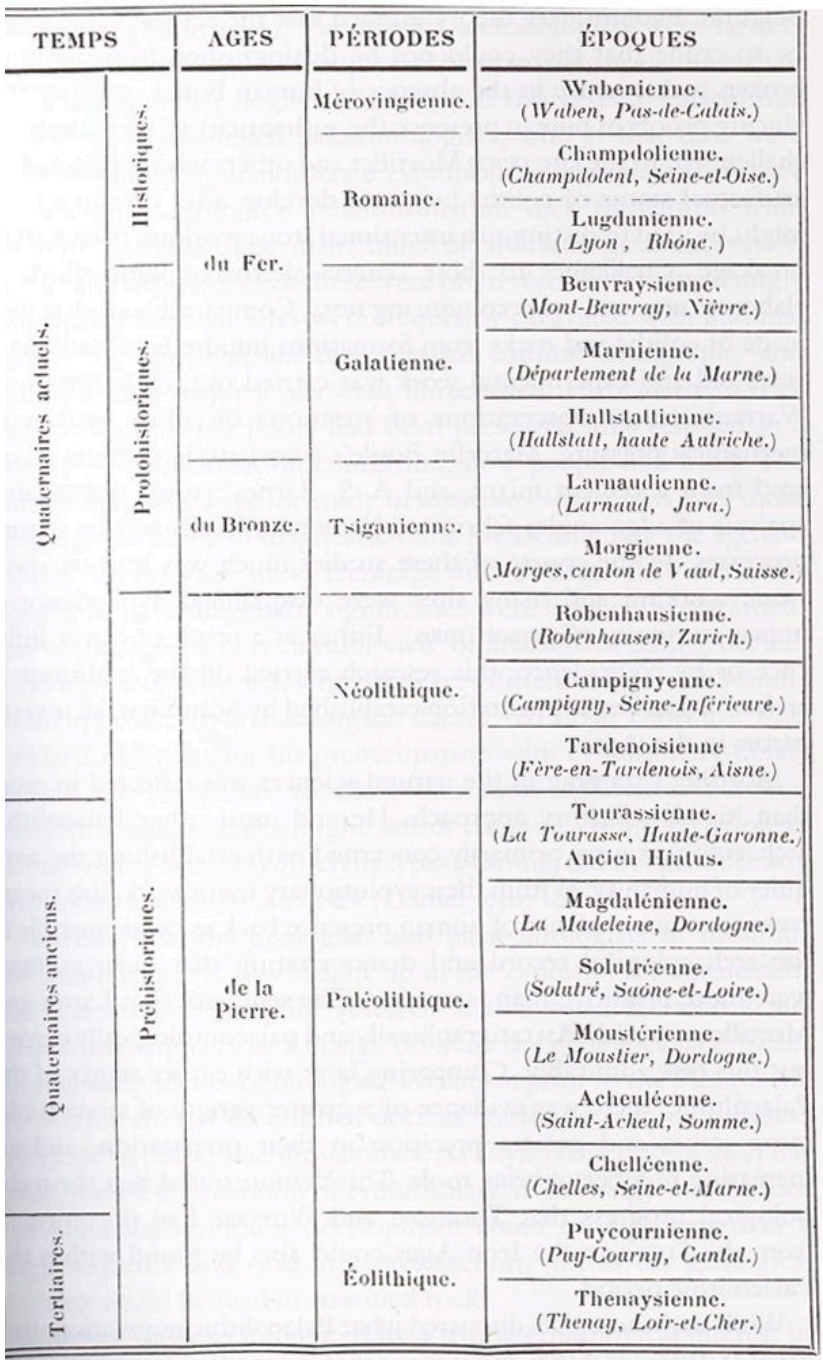
We suggest that Sarauw's organization of material categories makes up an archaeological model of an ontological divide between nature and culture, namely, that Nature, as represented by soils, plants and animals, constitutes explicit *Others*, while humans, as unified with and prolonged by their cultural tools, are *Culture and Subjects*. There is also another divide, found in the four different and parallel histories of evolution. These are (1) the histories of soils (2) of plants (3) of animals, (4) and of humans with their tools. The arrangement of the text gives the impression of four categories separated from each other by their individual development: They do not meet, but are separate lines in a pipeline model. Both of these principles of an ontological divide are in flawless accordance with major aspects of scholarship of the late 1800s and early 1900s. More detailed examples are concepts with reference to conditions concerning humans and technology, they demonstrate the use of a terminology with reference to notions about masculinity and social progress in public spheres of society. Historical terms of significance to our context are: *Technological Man*, *the Man of technical progress*; these reveal a tangible example of where archaeology encounters and interacts with history, and is a distinctive encounter between modern ideology and archaeological find materials.

This is the image of humans and their others in the Hiatus, the original image of how *nature and culture* should be founded in a previously unknown era of prehistory. It is consequently an important *ontological model* of how the early Stone Age world was considered to be constituted. According to a 19th-century framework this is a logical model of the world telling us that the layers of soils were considered to have developed first, followed by the plants, the animals and finally the humans who could make tools and develop together with their tools in terms of technical progress. The effect of Sarauw's model, of this original image of this prehistoric era still persists. The notion of the ontological divide between nature and culture is still unchanged in present-day interpretations of the Mesolithic, although with a more explicit focus on the technological development of tools as a force in the world.

Mullerup's encounter with chronological arguments

Sarauw's hub position was visible through his skill in setting the date of the site in three ways: botanically by the fur stubs, geologically by the association with the Ancylus Lake, and archaeologically by identification of a parallel find in Königsberg.

The stratigraphy of Mullerup certainly caused an encounter with one of the heavy debates in archaeology. When Sarauw presented his Mullerup interpretation, the recognized picture of the Stone Ages was quite different from the present one. As mentioned above, scholars in the late 1800s had defined a Palaeolithic and a Neolithic period with a temporal *lacuna* between them (Piette 1895; cf. Fig. 5), with the established name of the Hiatus (Westropp 1872). *Mullerup's chronology fell in this Hiatus* and came many years later to prepare for the general insert of a Mesolithic stage. The idea that there was such an ancient era, even in Denmark, was first suggested by Sophus Müller (Müller 1897, 42; cf. Koch 1916, 3), as Denmark had certain bone harpoons impossible to place chronologically. Later these, together with some tools in France, were classified in the same chronological stage as the Mullerup finds. An interesting thing about the identity of the Mesolithic period is that it now and



TEMPS		AGES	PÉRIODES	ÉPOQUES
Quaternaires actuels.	Historiques.		Mérovingienne.	Wabenienne. (*Waben, Pas-de-Calais.*)
			Romaine.	Champdolienne. (*Champdolent, Seine-et-Oise.*)
				Lugdunienne. (*Lyon, Rhône.*)
		du Fer.		Beuvraysienne. (*Mont-Beuvray, Nièvre.*)
	Protohistoriques.		Galatienne.	Marnienne. (*Département de la Marne.*)
				Hallstattienne. (*Hallstatt, haute Autriche.*)
		du Bronze.	Tsiganienne.	Larnaudienne. (*Larnaud, Jura.*)
				Morgienne. (*Morges, canton de Vaud, Suisse.*)
	Préhistoriques.	de la Pierre.	Néolithique.	Robenhausienne. (*Robenhausen, Zurich.*)
				Campignyenne. (*Campigny, Seine-Inférieure.*)
				Tardenoisienne (*Fère-en-Tardenois, Aisne.*)
Quaternaires anciens.			Paléolithique.	Tourassienne. (*La Tourasse, Haute-Garonne.*) Ancien Hiatus.
				Magdalénienne. (*La Madeleine, Dordogne.*)
				Solutréenne. (*Solutré, Saône-et-Loire.*)
				Moustérienne. (*Le Moustier, Dordogne.*)
				Acheuléenne. (*Saint-Acheul, Somme.*)
				Chelléenne. (*Chelles, Seine-et-Marne.*)
Tertiaires.			Éolithique.	Puycournienne. (*Puy-Courny, Cantal.*)
				Thenaysienne. (*Thenay, Loir-et-Cher.*)

Fig. 5. Mortillet's model of prehistoric development (and also of the formation of the French nation): The established chronology and terminology of prehistoric epochs as they were perceived at the time of the Mullerup excavation (after Trigger 1989, Fig. 15). It demonstrates that the Neolithic was understood as following directly on the Palaeolithic, while the supposed Hiatus is not placed directly between these epochs. Instead the French "Ancien Hiatus" is represented as the upper era of the Palaeolithic.

then, and actually still, is contested. In our time the Mesolithic is generally seen as a chronological phase, although it might fairly be named Epi-Palaeolithic (Rowley-Conwy 2007, 1). Recent publications have made clear that a discussion on the chronological affinity of the Mesolithic is sought through active dialogue between scholars in the Palaeolithic and the Mesolithic (Foulds 2014, v). *Microliths* cut the hands and feet of the peat workers, thereby indicating a prehistoric site. The suggested chronology was a concluding result of Sarauw's and his collaborators' systematic practices of measurement, comparisons and analyses. The conclusions affected archaeology internationally: it revealed a site in the Hiatus.

Summary and discussion

This article has aimed to analyse Sarauw's Stone Age model and to put forward our approach to historiographic methodology. Our material-semiotic method of reading Sarauw's archive reports (Holmberg & Hjørungdal 2016) was a precondition for our present analysis of his Mullerup model.

Our project was initiated by the question of how a historian can team with an archaeologist who aims to analyse a specific occasion in the history of archaeology. A definite origin of our method was that we recognized our disciplines' shared – but different – relations to archives. Even though both disciplines regularly use archives, we usually have different aims with our visits to archives. And above all, we rarely read archive material together. In the present article we move from archive acts to Sarauw's printed 1903 article.

As a basis for methodologically proper teamwork we have demonstrated the necessity of relating to theoretical and methodological tools adjustable to and operative in new contexts. We have benefited from our colleagues' introduction of *relational realism* and attuned some of its properties.

So far we can summarize the results of our encounter from different situatednesses, as the following: When we write archaeological historiography it is obvious that the archaeologist is the savant, and that the benefits of the analysis are to archaeology. However, an archaeologist is not a savant of the late 1800s as approached by professional historians. The specific benefit to history is that the Sarauw archive demonstrates a lucid example of how good and detailed a record can be produced and kept.

Without the historian's contribution, we would have lost articulate knowledge about the contradictory conditions around the end of the 19th century, because, when archaeologists discuss the influence of evolutionist ideas on prehistoric models, it is common to refer to the construction of the Three Age System. This is also where we find the clearest dissemination of evolutionist schemes to interpretations of prehistoric chronology (Rowley-Conwy 2007). The Mullerup example demonstrates, on the other hand, a more subtle way in which evolutionary ideas were diffracted into archaeology. In our analysis, we first defined the form in which the Mullerup model was presented, namely as implied in the organization of an article text. Our reading exemplifies mutual knowledge about a particular spatio-temporal academic phenomenon. Consequently our conclusion is a situated conclusion as it is drawn on the background of specific and situated practices. Specific encounters between scientific ideas, practices and archaeology came to materialize knowledge about notions of *Humans and Technology, Technological Man, the Man of technical progress*; they demonstrate a vital example of diffractions of the encounters with history, an encounter between ideology and archaeological find materials together with archaeological methods of classification. Together they make something new, an image of how nature and culture should

be constituted and linked in a previously unexplored prehistoric age.

As to Sarauw's generation of scholars, they learned as well as experienced social conditions in terms of varieties in notions of progress. A specific conclusion about constructive tensions within Sarauw's environment concerns how his privileged position in the hub made him able to see beyond the established practices of Nationalmuseet's specializations: the Mullerup materials were certainly analysed according to practices with separate sciences involved (geology, botany, zoology, archaeology). But Sarauw developed a capability for relational practices of seeing; he could take in the need for a more detailed investigation about how human-made tools were associated with the geological and botanical layers in the site.

A situatedness approach to scholarship also urges us to elucidate issues of where and how intellectuals are linked to their spatio-temporal ideologies and scientific theories. Although thinking is a central practice of academic work; we have to admit that it is as important to regard the more visual practices by which an academic phenomenon like a model emerges. Our practices of cooperation have initiated a new quality of connectedness between archaeology and history, a connectedness that has an explicit methodological bottom line. We can delight in the fact that we are granted this opportunity of analysis only because in Sarauw's time, citing practices were different from citing practices in our own time. Unlike us, when explaining a scientific matter he did not need to make clear whether his perception of the past world was mainly influenced by Darwin, or by Marx or by any of the genuine counterpoints of his epoch.

Conclusions

Our line of cooperation is an experiment in the field of historiographic methodology. In this specific case, an historian's eye on Sarauw's educational background and its spatio-temporal context has been an actual location for productive encounters with new results. It has also generated additional questions. One of them is to what degree we really meet on equal terms. Another aspect is what kind of further yield we expect from a methodological approach to cooperation between our specific disciplines. As the method we propose is not a closed system, but a flexible relationship, it has the properties of being dispersed and adjusted to other contexts with different source materials. Above all it has a capacity to be taken up in contexts where archaeology and current natural sciences cooperate; these are where the cooperating disciplines clearly have different locations and different voices and statuses in academia.

We problematized companionship by stating that companions do not need to be different species as they are in Haraway's original version of relational cooperation. A consequence is that a *Companion Disciplines Approach* is a proper model as it opens up to an enlargement of how we can discuss and develop flexible and local practices of scholarship. This approach made an interrogation of the generally supposed seamless closeness between our two disciplines. We have elucidated our adjoining situatednesses as a resource and demonstrated how methodological cooperation can be practised between scholars within two different but neighbouring academic disciplines.

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