

‘The Social’ and Beyond: Introducing Actor-Network Theory

Jim S. Dolwick

Published online: 28 April 2009
© Springer Science+Business Media, LLC 2009

Abstract In recent years, it has been suggested (e.g. TAG 2002, 2006; IKUWA3 2008) that it is necessary for the discipline to move beyond the study of ships and boats towards the ‘wider social contexts’ of seafaring and maritime activity. This paper investigates the contours of ‘social’ as an object of study. Two questions are asked: (1) how is this object defined within sociology, classical and contemporary social theory, and archaeology; and (2) what is the status of nonhumans, physical-material things, artefacts, plants, animals, etc.? After taking a look at several different theories, it is argued that it is not necessary for us to move beyond ships and boats. Instead, an alternative approach is offered, one that allows us to move beyond the restrictive ontology of the social.

Keywords Social · Agency · Hybrids · Objects · Ambivalence · Actor-networks

Introduction

After taking a look at three social approaches to the study of science and technology (Dolwick 2008), this paper examines several different interpretations of the concept ‘social.’ Here, my aim is not to present an exhaustive overview of social theory, but rather to highlight some of the ways of viewing ‘social’ as an object of study that might contribute to our endeavours in maritime archaeology. Unfortunately, this is not an easy task, since the concept has many different meanings:

- In perhaps its broadest sense, social means *association*. This is after the Latin word *socius*, meaning a companion or associate, with the root, *sequi*, meaning ‘to follow’ (see for example the way it is used in: Bascom 1895, p. 9; Giddings 1896; Kimble 1899, p. 670; Tarde 1895, 1903, p. 69; Ross 1910, pp. 5–6; Strum and Latour 1987; Latour 2005). When it is used this way, the meaning of the concept is left open to include anything and everything that may be associated together. Thus, *social* (connections, interactions) may include plants, animals and material artefacts as well as

J. S. Dolwick (✉)

Centre for Maritime Archaeology, University of Southampton, Southampton, UK
e-mail: jsd1@soton.ac.uk

humans. More importantly, there are no primary agents or main ingredients in this version. Instead, ‘actors’ are regarded as relational effects. Ultimately, theorists subscribing to this view tend to want to understand the world in terms of the performative aspects of radically heterogeneous ‘networks’ (e.g. Bruno Latour, Michel Callon and John Law’s actor-network theory; Andrew Pickering’s mangle-of-practice; Thomas P. Hughes’ seamless webs; Donna Haraway’s cyborgs).

- In a narrower sense, social is used in a restrictive manner to refer primarily to *human aggregates* or *humans-among-themselves* (see for example the way it is used in: Gillette 1916, p. 4; Cole 1920, p. 29; Pinch and Bijker 1987; Scott 2007, p. 105). When it is used this way, the world is invariably split up (a priori) into two separate halves: a social half, consisting of humans; and a natural-material half, consisting of things, etc. In this sense, human beings (subjects) are seen as the primary agents of a social world, and ‘social’ is what occurs when meanings and representations are passed from person to person. Consequently, elements of the natural-material world (objects) are ignored, or reduced to their symbolic representations. Ultimately, theorists subscribing to this view tend to want to explain the concept in terms of one or more of the following:
 - Discourse, intersubjectivity, and meaning making, involving mainly the use of language and symbols in micro-scale, face-to-face contexts (e.g. Goffman 1959)
 - The agency/structure dialectic, the conscious forward-thinking human subject versus the collective forces that constitute an a priori society (e.g. Bourdieu 1977; Giddens 1984)
 - The unconscious, the inner psyche, the ‘social’ within the mind, often explained in psychoanalytic terms (e.g. Lacan 2005; Žižek 2006, 2007; Irigaray 1985)
 - Phenomenological consciousness, transcendental ego, intentionality, Dasein, embodiment, temporality, spatiality, materiality, the lifeworld, and lived experience (e.g. Schutz 1932; Berger and Luckmann 1967)

Here the focus is not so much on trying to understand the world in terms of the performative aspects of radically heterogeneous networks, but rather on trying to explain it in terms of human action, agency and perception (e.g. Trevor Pinch and Wiebe Bijker’s social construction of technology approach; Marcia-Anne Dobres’ phenomenological social agency approach).

- In perhaps its narrowest and purest sense, social means *social structures* and *social facts* (see for example the way it is used in: Durkheim 1895; Fairbanks 1901; Bloor 1976, 2000/1992; Bloor and Edge 2000). When it is used this way, the concept refers primarily to macro-scale forces, which are supposed to exist independently of micro-scale interactions. Furthermore, these forces are supposed to impinge upon and determine the actions of individual subjects. Here, ‘social’ is meant to stand apart from other concepts, such as: ‘individual,’ ‘psychical,’ ‘natural’ and ‘material.’ Thus, ‘social’ is what is left over after these other elements are filtered out. Consequently, plants, animals and material artefacts are either ignored or treated as passive and deemed irrelevant for sociological inquiry. Ultimately, theorists subscribing to this view tend to want to explain the ‘social world’ in terms of causal structural forces (e.g. Durkheimian social theory; Marxian social theory; David Bloor’s strong programme of the sociology of scientific knowledge).

Of course, this list is not exhaustive. It is not meant to cover the entire range of perspectives, nor the many subtle differences and similarities between viewpoints. But,

certainly, one can understand the trepidation of someone (like me) who is trying to investigate the ‘wider social contexts’ of past activities by using primarily historical sources and material remains. One can interpret the word ‘social’ a number of different ways. By simply browsing through the dictionary, one can see that it has multiple definitions and derivatives. Social has even been added as a prefix to various academic sub-disciplines, which now include social geography, social psychology, social anthropology, and even social archaeology. In fact, one could argue, there are so many different ways of defining and characterising this concept that it almost has no meaning.

Sociologists have been debating its meaning and usage ever since the inception of sociology as an academic discipline.¹ Unfortunately, sociology has never had a dominant paradigm (Bryant and Peck 2007), and this has been a major problem. Without a common language, social scientists tend to talk past one another. According to sociologist, Freeman (2006, p. 8; quoting eminent anthropologist A.K. Romney), other disciplines do not seem to have this problem: “because they share a paradigm, [natural] scientists, like physicists and chemists, work together in a systematic manner,” but sociologists and social scientists “seem to struggle with each other in a never ending effort to re-define what should be studied and how.” Of course, not everyone may agree with Freeman and Romney’s assessment of the natural sciences; but other social scientists certainly share their view of sociology. For instance, recent introductory textbooks make it clear that the discipline is far from unified. As Drysdale and Drysdale (2007, p. 44) note:

Instead of a single paradigm, sociology has many; instead of a strong core of general sociological theory and research, we have many special sociologies, each with their own concepts, theories, and favoured research methods. Lacking a strong core of theory, method and knowledge, it has become increasingly difficult for sociologists to maintain a unified sense of the discipline as a whole.

Similarly, Turner (2001, p. 14) acknowledges:

Sociological theory is now so diverse that it is difficult to see any unity ever emerging. Sociologists do not agree on what is real, what our core problems are, what our epistemology is, and what our theories should look like...for me, this diversity spells trouble for the discipline. True, [it] also signals a certain vitality, but in the end, sciences must reveal consensus on problems and epistemology. Sociological theory does not have, nor will it ever have, such consensus; and there is danger here. If sociologists cannot speak with one voice, or at least many voices in a contrapuntal chorus, we will be overshadowed by those disciplines...that can.

Of course, this is not a recent problem. 18-years earlier, sociologists were talking about a general lack of unity within the discipline. As Islam (1983) writes:

It is widely acknowledged today that sociology is in a state of crisis. It is experiencing a crisis of paradigms. This is a crisis regarding the field and method of inquiry, that is, there is no consensus among sociologists on what they do and on how they do what they do (for similar comments, see Islam 1984, 1987, 2008).

¹ Sociology is known as the ‘science of the social.’ For examples of the debates, see the 1903 debate between Gabriel Tarde and Emile Durkheim at the *Ecole des Hautes Etudes Sociales*, in Clark 1969, and the 2008 mock repeat of this debate between Bruno Latour and Bruno Karsenti at Cambridge University, available online. See also the many debates played out in early sociology journals, such as *The American Journal of Sociology*, pp. 1898–1924.

And, 76-years before this, they were having similar problems, as Hagerty (1907, p. 649) indicates:

Sociology cannot be said to have made much progress so long as the writers of general treatises on the subject feel compelled to fill a fair portion of their works with a discussion of such topics as: definitions of sociology, method of sociology, scope of sociology, purpose of sociology, social laws and units of investigation, to say nothing of the fruitless attempt to solve the riddle: ‘Is sociology a science?’ The appearance of these topics in the foreground is the surest evidence of the unsettled state of sociological investigation. Until writers on the subject can make certain assumptions as to the point of view of sociologists and of the general nature of social phenomena, and proceed without preliminary digression to an analysis and discussion of data, sociology will not make much headway.

What is surprising is that Hagerty’s comments are just as fresh today as they were in 1907. Certainly, it is easy to string a series of negative quotes together that appear to represent the state of an entire discipline; this is not my intention. Rather, my intent is simply to point out that there has been a general lack of unity within sociology concerning *what to study* and *how to study it* (in fact, I have only just scratched the surface, see Turner 2001, 2007 for a more thorough critique; Eisenstadt 2007 for a refutation).

Already, this has not gone unnoticed by archaeologists, as Fredrik Fahlander (2001, p. 9) notes:

The social sciences today [2001] are often said to be in a state of crisis. Since the last half of the 20th century, sociological thought has been diverted into an increasing number of sub-disciplines: neo-Marxism, conflict theory, exchange theory, creative sociologies (phenomenology, ethnomethodology, existential sociology), systems theory, feminism, neo-functionalism, post-structuralism and post-colonial theory, etc. As many of these theoretical formations are contradictory in a basic sense, we will have to acknowledge that there probably never again will be *a* social theory; instead there are social theories.

Unfortunately, this makes it difficult for us to understand the past in ‘social’ terms (see Hodder 2004, p. 26). Since the word/concept is used in so many different ways, it is absolutely essential that we specify what we mean before we do any sort of social theorising. As I stated previously (Dolwick 2008), before I can even begin to analyse the past in such a way, I believe it is necessary to ask: ‘*which social?*’ Thus, this paper has two primary aims. The first is to examine several different classical and contemporary social theories. Special emphasis will be placed on how they portray ‘social’ as a theoretical object. The general idea is to illustrate that we are not all speaking the same language when it comes to this concept. The second aim is twofold: (1) to talk about the status of material objects (artefacts) within social theory and archaeology; and (2) to introduce actor-network theory (ANT). In such a way, I hope to place it within the context of other social approaches. I will use as my point of departure a recent critique of classical and contemporary social theory, which argues that the word/concept is essentially contested.

What is the Social?

In *What is the Social* (2003), sociologists Niels Albertsen and Bülent Diken (hereafter referred to as A&D) borrow the concept of ‘essentially contested concepts’ from the

philosopher W.B. Gallie (1956) to argue that ‘the social’ is essentially contested. According to Gallie (1956, pp. 168–180; cited in A&D 2003, p. 2), a concept must have the following characteristics in order for it to be considered as such:

- (1) It must be appraisive in the sense that it signifies or accredits some kind of valued achievement
- (2) This achievement must be of an internally complex character, for all that it is worth is attributed to it as a whole
- (3) Any explanation of its worth must therefore include reference to the respective contributions of its various parts or features; yet prior to experimentation, there is nothing absurd or contradictory in any one of a number of possible rival descriptions of its total worth, one such description setting its component parts or features in one order of importance, a second setting them in a second order, and so on. In fine, the accredited achievement is initially variously describable
- (4) The accredited achievement must be of a kind that admits of considerable modification in the light of changing circumstances; and such modification cannot be prescribed or predicted in advance
- (5) Each party must recognize the fact that its own use of [the concept] is contested by those of other parties, and each party must have at least some appreciation of the different criteria in the light of which the other parties claim to be applying the concept in question
- (6) There must be a derivation from an original exemplar whose authority is acknowledged by all the contestant users of the concept
- (7) The continuous competition for acknowledgement must enable the original exemplar’s achievement to be sustained and/or developed in optimum fashion

According to A&D (2003, p. 2), ‘social’ meets all of these requirements:

- (1) It is appraisive in the sense that scholars often use it to denote, or measure, the grandeur of a collective in terms of various factors, such as participation (membership), alienation (otherness), domination (oppression), freedom (emancipation) and welfare, etc.
- (2) It is almost always used to refer to something that is internally complex
- (3) As a concept, it is variously describable
- (4) Its meaning has been considerably modified over time
- (5) There is little agreement over the many uses of the term
- (6) Although there is no single, or set, tradition from which the concept is derived, it is fairly easy to determine which set of traditions—e.g. Aristotle and the Greek polis, Marxism, Durkheimian social theory, Weberianism, etc.—a given scholar acknowledges as the original exemplar
- (7) And finally, due to the effects of rivalries and conflicts between different viewpoints, it is highly probable that it will remain contested

Gallie’s (1956, p. 198) suggestion was that in the case of an essentially contested concept, we can best see more precisely what it means by comparing and contrasting our uses of it now with other earlier uses of it or its progenitors. In their article, A&D (2003, p. 3) attempt to do this: to evaluate the social in terms of three central images of thought: ‘unity,’ ‘purity,’ and ‘order.’ Specifically, they argue that classical social theorists: Karl Marx, Emile Durkheim and Max Weber, defined ‘social’ in these terms. Thus, their aim in this study is to see what happened to these three central themes in the present state of contesting social theories. In so doing, they compare and contrast the works of a number of

contemporary social theorists—namely: Pierre Bourdieu, Niklas Luhmann, Georges Batille, Zygmunt Bauman, Jacques Lacan, Bruno Latour, John Law, Gilles Deleuze and Félix Guattari—with the purpose of deconstructing and reconstructing the concept in terms of other, more contemporary themes, such as ‘differentiation,’ ‘heterogeneity,’ and ‘ambivalence.’

In addition, they produced a diagram (Fig. 1), which shows how different concepts are related, and where they exist in relation to four different hypothetical dimensions. But, in order to understand the diagram, it is necessary to clarify several things. First, it is necessary to note that its purpose is to be able to open up a discussion on two operational levels: the ontological and the epistemological. Within Western philosophy, ontology is the study of being and existence (of *what there is*), while epistemology is the study of knowledge and justified belief (of *how we know*). Generally, in order to establish *how we know*, it is necessary to determine *what there is* (and vice versa). Thus, the point of delving into ontological and epistemological issues here is to become more aware of how different social theorists define their object of study. Unfortunately, there is little agreement on how to do this. For instance, one theorist may define ‘social’ as a *rhizome*, while another one defines it as a *region*. The important thing to note is that they are not talking about the same object. Consequently, as A&D note (2003, p. 44):

We are not speaking of a methodological pluralism, which assumes that there is one object of study [a universal social], and that, by using different perspectives, we can represent it from different points of view...Indeed, the different perspectives

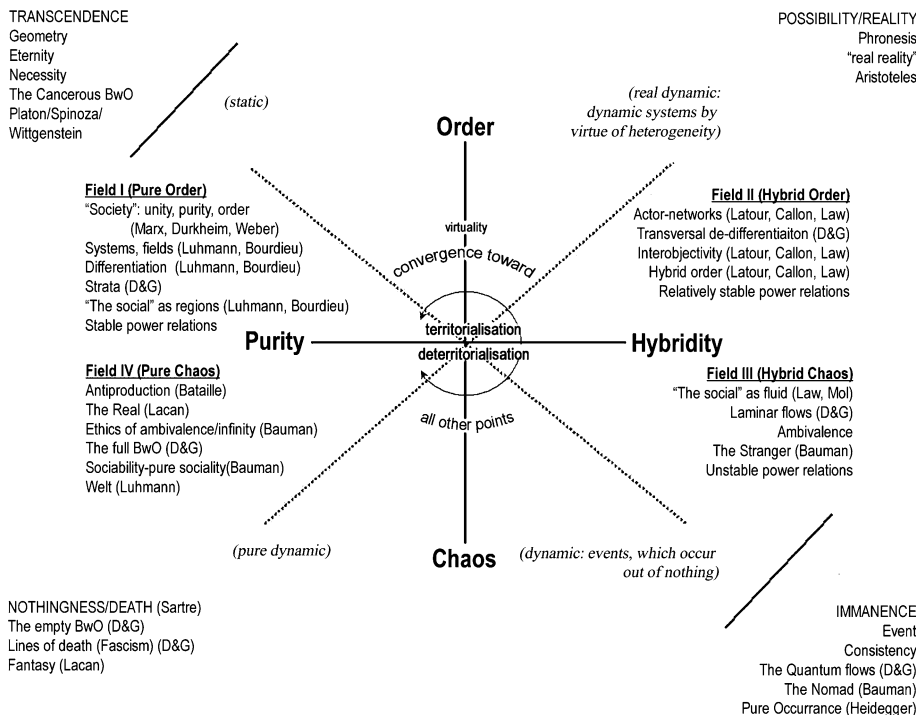


Fig. 1 The highly complicated ‘social’ as depicted by Albertsen and Diken 2003 (also 2006, p. 239)

employed in the different fields of the diagram do not represent the same object, which is already found outside the observer.

Rather, each social theorist is studying a different object. This makes it difficult to combine theories, or even to compare and contrast them, since each theorist is (in a sense) producing a different version of ‘social.’

With that in mind, the diagram itself is just a visual aid. It is their way of trying to keep track of a number of different concepts, while still trying to understand the similarities and differences between them. Incidentally, the labels *Purity* and *Hybridity* are meant to refer to the elements (or ingredients) of the social, while *Order* and *Chaos* are used to refer to its organisational forms (A&D 2003, pp. 41–47).

- *Purity*—refers to homogeneity. Social concepts that have only one active or primary ingredient (e.g. humans) are located towards the left of the horizontal axis. This is relevant mainly to the notion of social as human aggregates and social facts.
- *Hybridity*—refers to radical heterogeneity and ambivalence. Concepts that include active contributing nonhumans (plants, animals, and material artefacts, etc.), or that allow for mixtures of people-and-things, are located towards the right. This is relevant mainly to the notion of social as associations.
- *Order*—refers to systematic consistency and stabilisation. Concepts that depict social action as relatively stable/predictable/organised are located towards the top of the vertical axis. Essentially, this involves all three definitions.
- *Chaos*—refers to inconsistency and destabilisation. Concepts that portray action as (potentially) chaotic/unpredictable/disordered are located towards the bottom. This is relevant mainly to the notions of social as human aggregates and associations.
- The two planes, *The Plane of Immanence* and *The Plane of Transcendence*, pertain mainly to Deleuze and Guattari’s approach. Their style of analysis is somewhat different from the other social theorists, so A&D represent them differently in the diagram. Additionally, the labels, *Nothingness (Death)* and *Possibility (Reality)*, encapsulate the works of various other theorists, as indicated.

It is important to point out that the way different concepts are positioned in the diagram is not meant to suggest that they are necessarily fixed into those positions. As A&D (2003, p. 41) note, they do not see the relationships between *Purity* and *Hybridity* and *Order* and *Chaos* as absolute and complete opposites, but as degrees on a continuum. So, some concepts may be located closer to the central point, while others could be positioned farther away from it. It is mainly in the interest of space that concepts are grouped together the way they are (in list form). Moreover, a re-reading of any one of the social theories may produce various ‘lines of flight,’ or modes of transcendence, from one field to another. Rather, what A&D hope to accomplish is to be able to (at least initially) situate different concepts within certain fields and then operate on multiple planes of thought regarding a definition of what ‘social’ might be. Thus, the questions they ask are: What are the active elements of particular theories and how are they arranged? Does a concept/theory relate to any one of the hypothetical dimensions? If so, how does it relate?

Themes of Classical/Traditional Social Theory: Unity, Purity, Order

A&D begin their study by reviewing the works of classical social theorists Marx, Durkheim and Weber, specifically in terms of the three central images of thought: unity,

purity and order, as mentioned above. As they note, all three scholars, in one way or another, emphasised the central unity of the social. That is, they used the term ‘society’ to refer to the clear-cut boundaries of nation states. But, even when the focus was on smaller groups, they used the term ‘social’ to refer to a collective whole with several basic unifying elements. Of course, each theorist had a different way of portraying unity. For instance, for Marx, the unity of the social rested on the economic infrastructure, primarily through the notion of capital. As a result, the revolution was intended to disrupt or overturn this central area of society. For Durkheim, shared norms and values were the central unifying forces; while for Weber, the unifying element was human rationality, which he used in a negative sense to suggest that individuals were in danger of becoming trapped in an ‘iron cage’ (or ‘shell as hard as steel’) of rule-based rational control. It is also important to point out that theorists following them even used concepts relating to difference, such as socio-economic class, gender, race, and ethnicity to signify unity.

In addition, classical theorists emphasised the purity of the social. For instance, in *The Rules of the Sociological Method*, Durkheim (1895/1982, pp. 50–59) claimed exclusively for sociology certain phenomena called *social facts*:

A social fact is any way of acting, whether fixed or not, capable of exerting over the individual an external constraint; or which is general over the whole of a given society whilst having an existence of its own, independent of its individual manifestations (Durkheim 1895/1982, p. 59)

Within this scheme, social facts are independently existing values, legal codes, customs, morals/ethics, languages, religious beliefs, and practices, which are capable of exerting a coercive force over individuals. They are supposed to have four main qualities: externality, constraint, independence, and generality. Moreover, they are supposed to have their own unique characteristics, making them different from the subject matter of other sciences, such as biology or psychology (Durkheim 1895/1982). Unsurprisingly, physical-material things, artefacts, plants and animals are not considered ‘social’ in this sense. Certainly they exist within society and reflect social action, but Durkheim had something else in mind: specifically, that certain phenomena exist, which are primarily or ‘purely’ social in the sense that they are not natural, material, biological, psychological, or anything else for that matter (Craib 1997). Thus, for Durkheim, ‘social’ referred to something that was *sui generis*.

Besides unity and purity, all three scholars emphasised the organisational aspects of the concept. That is, they sought to detect the laws of social change, which (presumably) determine how and why a society maintains a stable, cohesive order over time. However, as with the other themes, each theorist had a different way of portraying order. For instance, for Marx, the economy (and capital) had certain values, which, although negative, brought order out of chaos. For Durkheim, organic solidarity characterised by a division of labour created order in modern societies; while for Weber the iron cage was a concept of order, albeit a negative and tragic one. It should be pointed out that their preoccupation with order was perhaps an attempt to address the problems inherent in modern progress. That is, many of their works dealt with change, and the perceived loss of morals and values within society, as well as the positive and/or negative aspects of some new phenomena, such as the growth of cities, increasing suicide rates, the presence/absence of religion, the disintegration of the family, the rise of factories, and the spread of industrialisation.

Themes of Contemporary Social Theory: Differentiation

Over the course of the twentieth century, other themes have come to replace the classical/traditional emphasis on unity, purity and order. Differentiation is one of those themes. This is the notion that society is divided (stratified) into self-governing regions, which do not require a central unifying force to secure their overall coherence. However, it is important to note that this idea has been manifested differently within the works of different social theorists. Niklas Luhmann and Pierre Bourdieu are two scholars who have developed dissimilar versions of this theme.

Horizontal Differentiation

For Niklas Luhmann (e.g. 1982, 1986, 1987, 1990, 1995), modern society is differentiated in terms of a number of horizontally arranged subsystems: e.g. an economic system; a science system; a system of art (2000), etc. (Fig. 2). Each subsystem is supposed to take care of one particular societal function, while ‘society’ itself, the overall comprehensive system, represents the sum total of all of these different subsystems put together. This is in contrast to ‘traditional’ society (Luhmann 1997), depicted as centrally unified, arranged in a vertical/hierarchical manner from the aristocracy down to the peasantry. In Luhmann’s (1990) more modern version, each subsystem is ‘autopoietic,’ or self-reproducing. Each one works according to its own unique code, and maintains its own boundaries between the inner system and the outer environment.

Here, the basic unit of analysis is ‘communication,’ an act consisting of three combined elements: information, utterance and understanding (Luhmann 1995). To briefly summarise: information from the outside world is not made relevant to a particular subsystem (or to society at large) until it is formalised/uttered, decoded, and rendered understandable within the system. Certainly, this involves individual human agents, but within Luhmann’s approach they are not the main social units. This is in contrast to other social approaches, which centre almost exclusively on social action, and the relationship between agents and structures. In fact, an individual is only considered ‘social’ to the extent that he or she communicates (King and Thornhill 2003). Overall, it should be pointed out that since communication itself is the active social element, physical-material artefacts only play minor roles.

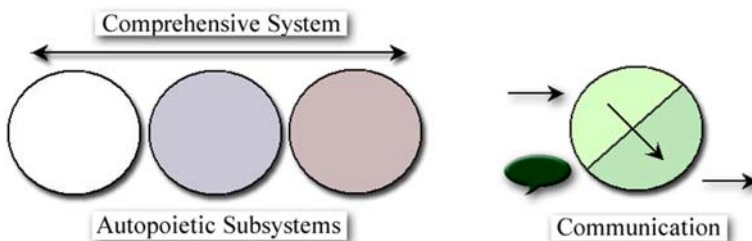


Fig. 2 An interpretation of Luhmann’s comprehensive system

Vertical (and Horizontal) Differentiation

Pierre Bourdieu's (e.g. 1977, 1985, 1986, 1990, 1992) version is strikingly different. For Bourdieu, modern society is a social space, consisting of a number of autonomous fields, or spheres of play (Fig. 3). Examples include an academic field (1988); a language field (1991a); a scientific field (1991b), and so on. Each field is supposed to have its own values and regulatory principles. In a way, this is similar to Luhmann's approach: a field is a system of relations. However, unlike Luhmann's theory, people (agents) and group configurations are the analysable social units, and the way the fields are differentiated is not meant to suggest that they are not also 'traditional' in the sense of having some form of vertical hierarchy. In other words, for Bourdieu, modern social spaces are not only divided horizontally, into a number of different fields, but also each field is subdivided by way of a kind of vertical hierarchy.

Here, differentiation involves power and dominance. It is the difference between those who dominate and those who are dominated. More specifically, Bourdieu (1986) stresses the idea that social inequalities are the result of competition for various forms of *capital*. This includes the struggle for:

- *Symbolic capital*—the 'objects' that social groups consider to be valuable. This includes the struggle for distinction and prestige within a field.
- *Cultural capital*—education, skills and other accumulated symbolic resources, which most or all social groups consider to be valuable
- *Economic capital*—ordinary economic resources: money, cash assets, a system of currency, etc.
- *Social capital*—interpersonal relationships, contacts and acquaintances, which enable the mobilisation of different forms of capital within a group

In addition to field and capital, 'habitus' plays a major role in Bourdieu's (1977) approach. This represents a person's subconscious attitude for how the 'social world' works. Essentially, it operates in a kind of circular manner. Social structures are seen to influence the way individual agents think and act within their respective fields. In turn, these dispositions, or 'habits,' are supposed to work their way into the various social practices, which reproduce social order. Overall, habitus serves as a kind of link, joining the involuntary and coercive aspects of structure to the reinforcing patterns of practice. Needless to say, all of this revolves around human action. Material objects serve mainly as forms of capital, bolstering a subject's status within a particular field.

Despite their differences, the social theories of Luhmann and Bourdieu are located within the *Pure-Order* section of the diagram for three reasons. First, even though they

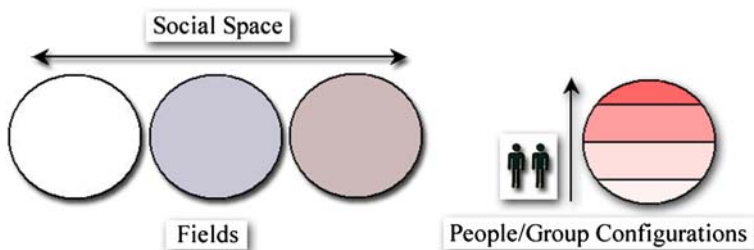


Fig. 3 Rough sketch of Bourdieu's social space

challenge the idea of unity their portrayal of ‘social’ remains distinctively self-referential. Second, they both seem primarily interested in showing how social order is achieved and maintained. And third, neither scholar introduces heterogeneity, hybridity, ambivalence or uncertainty into their respective theories (A&D 2003, p. 42).

Heterogeneity and Ambivalence

Besides differentiation, other themes of contemporary social theory include heterogeneity and ambivalence. Heterogeneity simply means diversity, in terms of social units, while ambivalence means vacillation or uncertainty, i.e. the possibility of assigning a social unit: person, group, object, or event, to more than one opposing social category. This can also be understood as having mixed feelings about something, or as the feeling one gets of being torn in two different directions at the same time, such as a feeling of love/hate (Fig. 4) (Bauman 1991, p. 1). Both themes are used to indicate a general movement away from the classical/traditional notions of unity, purity and order. However, as with differentiation, they mean different things to different theorists. Georges Bataille, Zygmunt Bauman, Jacques Lacan, Bruno Latour, Michael Callon, John Law, Gilles Deleuze and Félix Guattari have all developed dissimilar versions of ‘social’ using these themes. However, instead of centring on purely social facts, they have added such ‘diverse’ elements as: (1) anti-production and the sacred—Bataille; (2) morality/ethics—Bauman; (3) the unconscious—Lacan; (4) dedifferentiated flow—Deleuze and Guattari; and (5) material objects, artefacts, animals, plants, and physical things—Latour, Callon and Law.

In this section, my aim is not to provide a thorough review of each version (for that see A&D 2003, pp. 9–20 or 2006, pp. 231–249), but rather to focus on the latter two: (1) Deleuze and Guattari’s depiction of social as ‘de-differentiated’ flow; and (2) Latour, Callon, and Law’s approach, which includes material artefacts. While the other three, Bataille, Bauman and Lacan, provide interesting interpretations of social as ambivalence, and include elements, which could be said to diversify it beyond purely social facts, one can still situate them at the *Pure* end of the diagram (Fig. 1), albeit in the chaotic section, since theoretically pure humans are still the main analytical units.

For instance, Georges Bataille (e.g. 1933/1979) was one of the first scholars to introduce a form of heterogeneity into social theory. He did this by way of the ‘superstructure,’ the imaginary upper sphere of Marx’s infrastructure, society’s economic base. In the text cited above, he divides the total social world into two segments: the homogeneous and the heterogeneous. Much like Luhmann’s systems and Bourdieu’s fields, social activity of one

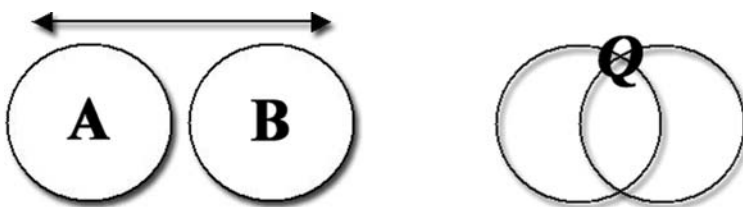


Fig. 4 Instead of viewing ‘social’ in terms of separate, clearly defined regions (*left*), some contemporary social theorists prefer to emphasise the idea of ambivalence (*right*). The area ‘Q’ is meant to represent this idea; i.e. Q is an object that is simultaneously *both* A and B and *neither* A nor B. It can be defined in terms of AB, yet it still remains outside

form or another is supposed to occur within each segment, and social units (i.e. people) are supposed to recognise the differences between them. The homogeneous segment (A) is characterised by production, or law, industry and the economy, topics of classical/traditional sociology, while the heterogeneous segment (B) is marked by ‘anti-production,’ or fear, waste, excess and crime, topics that were generally ignored. ‘The sacred’ (Q) is just another category typifying the elements of the social, which are hard to label, such as religious phenomena. However, this is where Bataille differs from the other two theorists, one can associate ‘the sacred’ with either production ‘or’ anti-production. Alternatively, one could argue that it does not fit either one, hence the theme of ambivalence. Here, ‘social’ is regarded as something more than unity, purity and order. But, still, the active elements are theoretically pure humans.

Zygmunt Bauman (e.g. 1991, 1993, 1999) does something similar in his version. However, instead of centring on society’s superstructure, he focuses on people, and defines ‘social’ in terms of interactions. While Bauman is known for developing various post-modern social concepts: e.g. ‘morality,’ ‘habitat,’ ‘stranger,’ etc., nearly all of them are focused on perception or some form of intersubjectivity. For instance, ‘morality’ is regarded as an individual’s sense of right and wrong (rather than as a coercive structural force), while ‘habitat’ refers to the ambivalent contexts of interaction. Similarly, ‘stranger’ plays on the idea that social interactions may involve unsettling encounters with people who are neither friends (A) nor enemies (B), but both (Q). On the diagram (Fig. 1), stranger is located within the *Hybrid-Chaotic* section, primarily because such people are always viewed from the position of the dominant observer and treated as ‘objects,’ arranged into groups according to type (Bauman 1999; Jacobsen and Poder 2008, pp. 158–159). However, as I noted above, this is intended as a sliding scale; so while Bauman’s ‘social’ is more ambiguous, chaotic and diverse than that of classical social theorists, it is still centred on theoretically pure humans.

The same can be said of Jacques Lacan (e.g. 1966, 1972, 1981, 1986, 1992, 2005; A&D 2003, pp. 15–19) and his followers (e.g. Slavoj Žižek 2006, 2007). Like Bauman and Bataille, Lacan focuses on humans. However, instead of centring on aspects of consciousness, such as morality and agency, Lacan focuses on the unconscious, thus taking us further away from the notion of ‘purely’ social facts, which exclude psychological phenomena. For Lacan, the socially structured psyche governs all aspects of human existence. Central to this idea is the notion that it is structured like a language, influenced by psychosexual feelings of desire and lack, central (yet negative) concepts within psychoanalysis, both of which are seen to revolve around the Oedipus complex, an articulation of ‘society’ involving a family triangle. This interweaving of language, sexuality, and the psyche is given formal expression in Lacan’s notion of the Symbolic (A), an order/dimension of human life, portrayed as one ring of a Borromean knot, along with the Real (B) and the Imaginary (C) (for a definition of each see Fig. 5). Here, the psyche (Q) is thought to occupy an ambivalent position straddling the boundaries of each order. But, within Lacan’s repertoire, only the Symbolic has any actual significance (Colebrook 2002b, p. 16).

The Social as Dedifferentiated Flow

Gilles Deleuze and Félix Guattari’s (D&G) (e.g. 1972/2000, 1980) rendering of the concept is quite different. Instead of a psychoanalytic, structural linguistic interpretation, they opt for a more fluidic one. In *Anti-Oedipus* (AO) (1972/2000) and *A Thousand Plateaus* (ATP) (1980), they produce a version of social that is similar in some respects to Lacan’s,

The Real is the world of matter, outside of language, inassimilable to symbolisation. It is undifferentiated, absolutely without fissure. It is the Symbolic, which introduces a 'cut in the real' in the process of signification. In other words, 'it is the *world of words* that creates a *world of things*' (Evans 1996: 162)

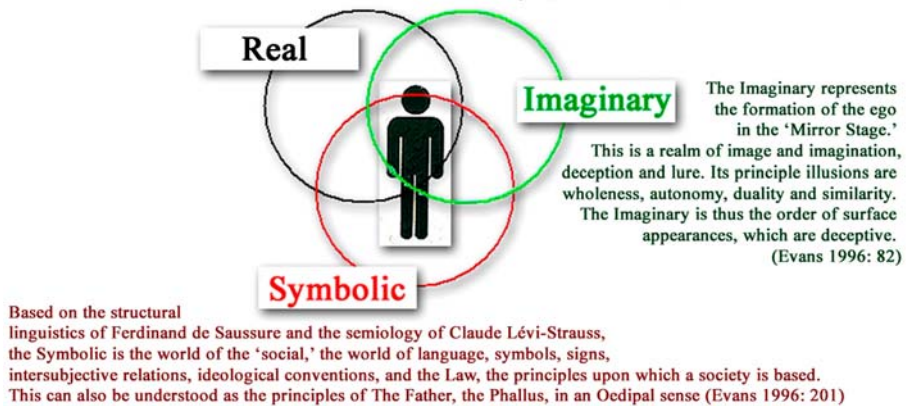


Fig. 5 Lacan's 'social' (Source: Evans 1996)

yet distinct in several ways. First, it is necessary to note that *AO* was intended as a critique of psychoanalysis. Throughout, D&G raise objections to the way the psyche is reduced to the Symbolic, and to the Oedipus complex, more generally. Instead, they prefer to see it as a kind of essence, which 'flows' in all directions. In such a way, they seek to erase the boundaries between Lacan's orders. And second, it is necessary to note that their philosophy is a synthesis (as well as a critique) of various other approaches, including phenomenology, existentialism, structuralism, and Marxian social theory—all of which were popular in France during the 1940s–1980s. However, instead of adopting them as is, they mischievously 'criss-cross' them, for instance putting the Lacanian notion of desire into the socioeconomic category and the Marxian notion of production into the realm of the unconscious (D&G 1972/2000, pp. 22–35).

They call this approach 'schizoanalysis,' which stresses (not the primacy of the psyche, but) the primacy of parts, or heterogeneous multiplicities (Colebrook 2002a, p. 5). As a result, their social units tend to be fusions, or couplings of 'people-groups-things-ideas.' Furthermore, each unit has a movable borderline, referred to as a stuttering 'and...and...and' (Deleuze 1995, p. 44). Thus, here, instead of limiting the social world to 'individual agents' and 'social structures,' they are able to shift the boundaries and add different units (even 'natural' and 'material' ones). In fact, the social world itself is regarded as an interactive assemblage, an open creative process of connections, exchanges and divergences.

Fortunately, *AO* and *ATP* are full of metaphors illustrating their ideas. For instance, in characterising the political State and the human body, they use the term 'machine,' an assemblage of parts, or couplings, that work and produce (D&G 1972/2000, pp. 36–50, 284).² As they see it, a body is an assemblage of biogenetic material, thoughts, things, and

² To be honest, I could have taken my pick of metaphors. There are so many other concepts within *AO* and *ATP* that illustrate the idea of social flow. In the interest of space, I limited my review. For instance, 'BwOs,' or bodies without organs, are unproductive machines, or 'what remains when you take everything away' (D&G 1980, p. 150). These can be broken up into various types: empty, full, and cancerous. In addition, they introduce different types of 'flow': laminar, quantum, etc., and different types of 'strata.' Here, the particular definitions of each concept are unimportant. The general idea is to emphasise: difference, multiplicity, fluidity, and mobility.

socio-cultural powers, etc., all coupled together in a (more or less) fluidic way, acting and reacting in relation to one another and to other bodies. These ‘machines’ produce and conduct desire. Similarly, the political State is seen as an effect of assembling bodies, materials, ideologies, and other socio-economic and cultural elements. In such a way, neither ‘body’ nor ‘State’ exists on its own. Instead, they are ‘plugged in’ to one another, and perpetually changing, ‘*becoming*’ something different (D&G 1980).

‘Rhizome’ is another concept illustrating social fluidity and infinite potentiality. Although its technical definition (in botany) is a horizontal stem growing across interconnected roots, throwing up shoots in different locations, D&G use this as a metaphor for just about everything, including texts, animals, and hyper-fluidic social organisation (D&G 1980, pp. 6–7). Visually, this is depicted as a decentred system of points or lines, which can be connected together in any order and without hierarchy (Fig. 6). Essentially, they use this as an alternative to an arboreal (tree) structure, an organisational ranking system, ordering social units into a particular hierarchy, according to predecessors and roots. For instance, the formal organisation of the Catholic Church, Marxian social class, and the Dewey Decimal System are all (idealised) social arboreal structures. Tree structures are based on similarity, offering a particular taxonomy of forms within a specific category. Against this logic, a rhizome is chaotic and based on difference, allowing for all possible forms of association. The point of doing exploratory rhizomatic analysis is to see how social units are related and arranged (or rather to see their potentialities). Furthermore, there is no top or bottom to a rhizome. Whatever is in it is always in the middle.

Overall, the aim of their theory is to leave the ‘social world’ ‘*de*’-differentiated, or open, unspecialised, allowing for the possibility of endless sub-groupings and differentiations.

The Status of Material Objects (Artefacts) within Social Theory

With the exception of D&G, the other social theorists mentioned above have not had much to say about material artefacts. In fact, there has been a tendency within social theory to push artefacts (and artefact-use) over to the sidelines of human social action. Of course, some social theorists have paid passing reference to objects. For instance, Marx’s conception of social, specifically his notion of historical materialism, is based upon the idea

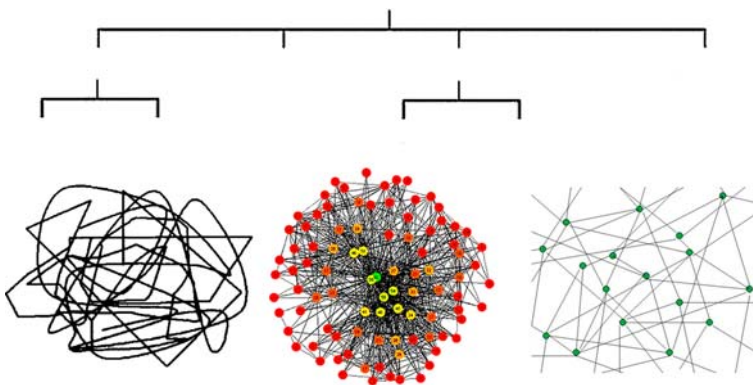


Fig. 6 Top: standard tree structure. Bottom: different depictions of rhizome (Source: Zellweger et al. 2002; Seto 2006)

that material resources form part of an economic infrastructure, which affects the development of society. However, even he tends to reduce objects to mere ‘tokens of capital’ by treating them primarily as commodities and fetishes (of course the extent to which he does this is debatable; for a critique of Marx’s materialism, see Bennett 2004, pp. 348; Latour 2005, p. 84; Fitzgerald 2006; for a defence, see Castree 2002; Meskell 2004; Gareau 2005).

Similarly, for Durkheim (1895/1982, p. 93), things are integrated within the social, yet they remain passive, as he indicates after defining social facts (see also Fahlander 2001, p. 60; and Latour 2005, p. 73):

The first origins of all social processes of any importance should be sought in the internal constitution of the social group. It is possible to be even more precise. The elements, which make up this milieu, are of two kinds: things and persons. Besides material objects [things] incorporated into society, there must be included the products of previous social activity: law, established customs, literary...artistic works, etc. But it is clear that the impulsion, which determines social transformations, can come from neither the material nor the immaterial, for neither possesses a motivating power. There is, assuredly, occasion to take them into consideration in the explanations one attempts. They can bear with a certain weight on social evolution, whose speed and even direction vary according to the nature of these elements; but they contain nothing of what is required to put it in motion. They are the matter upon which the social forces of society act, but by themselves they release no social energy. As an active factor, then, the human milieu itself remains

Here, the human milieu is set up in opposition to things. For Durkheim, things lack the prerequisites to release social energy. They are the matter upon which the social forces of society act, and in such a way they may exist in the background and function in a representational sense. But, this does not mean that actual physical-material things are ‘necessary,’ or even particularly important, for human social action. Durkheim merely presents us with a one-sided view of the world/universe, where the human species acts ‘on’ things, but not with, through, or in response to them.

Bourdieu treats things in much the same way. For him, objects are symbols and forms of capital. That is, people are supposed to use things as the means to various ends, as possessions and commodities. But, physical-material objects do not seem to do much else. Like mirrors, they merely ‘reflect’ whatever meanings and values the agents give them (Dolwick 2008). Moreover, Luhmann’s conception of social as communication is still better situated towards the ‘Pure’ end of the diagram (Fig. 1). And, the social theories of Weber, Bataille and Bauman are more or less directed towards human action, while Lacan’s approach reduces everything to the Symbolic. In fact, using his theory, it is not possible to ever really get to know the ‘Real’ world, the world of actual biological human bodies, plants, animals, and material objects, especially not through the physical-material things one encounters. Once something ‘Real’ is thought about and put into words, it becomes subject to a pre-existing system of signifiers and reduced to language (Evans 1996, pp. 107, 160; see also Evans 2005).

So far in this review, each social theorist has had a different way of portraying ‘social,’ and it is difficult to see how these different perspectives can be synthesised. Of course, it is always possible to mix and match theories; but then one would still be faced with the (monumental) task of having to incorporate artefacts, physical-material things, plants, animals, the natural environment, and so on. One of the main problems with each of the various approaches mentioned above (with the exception of D&G) is that they provide a view of ‘social’ that is largely devoid of *active* nonhumans. That is, things are depicted as

tokens and symbols, but they seem to lack the capacity to act in other ways. Furthermore, human beings do not seem to actually need or require artefacts. They seem to get along just fine without them. Most, if not all, of the action—involving social structures, practices, acts of perception, communication, the socially structured psyche, agency, and so on—revolves around theoretically pure humans. This does not mean that the above theorists are necessarily ‘wrong.’ But their lack of interest in things (or even human-thing combos, *hybrids*) complicates matters for archaeologists. The main question is: how does one fit artefacts, indeed all kinds of things, into depictions of ‘social’? Furthermore, is it possible to do this without *reducing* them to some abstract (social, linguistic, or psychical) force?

Actor-Network Theory (ANT)

For Bruno Latour, Michael Callon, and John Law (A&D 2003, pp. 20–28), ‘social’ is defined as *association* and understood in terms of *webs*, or actor-networks, of materially heterogeneous elements. Here the definition is significantly extended from humans-only to include anything and everything that may be associated together. The emphasis is on explaining associations, including power relationships and inequalities, rather than on using such phenomena as explanations. For instance, to say that some people are rich and powerful *because they have capital* is a tautology. In contrast, actor-network theorists want to understand (and show) how they created that bond (Latour 2005; Czarniawska 2006, p. 1554). Moreover, the binary dualisms of social/natural, subject/object, individual/group, agency/structure, micro/macro, local/global, inside/outside, and particular/universal, are ‘bypassed’ (Latour 1999a) in favour of treating everything, humans and nonhumans alike, as relational effects. In such a way, ‘social’ is conceived of not as an essential property of humans, but as something that is actively assembled. As a result, questions tend to centre on how actors become interconnected, or on how they fall apart and become disconnected (and then, of course, reconnected to other actors, keeping in mind that no actor is an island). This means that in contrast to other social theories this one involves a number of potentially active elements.

Before describing the central features of this approach, it is important to note that actor-network ‘theory’ is not necessarily a theory, per se. Theories tend to explain why something happens, but ANT places more of an emphasis on showing how associations are made and transformed (Latour 2005). Perhaps it is best understood as a descriptive method. Over the years it has had many names, including the *sociology of translations* (Callon 1986a), *actant-rhizome ontology* (Latour 1999b), the *sociology of associations* (Latour 2005), and the *semiotics of materiality* (Law 2007). It emerged within the field of science and technology studies (STS) in the 1980s with four documents: Callon and Latour (1981), Callon (1986a), Law (1986), and Latour (1988a–d). However, it has since changed, and faced its own transformation through processes of translation. At one point in its history, ANT theorists (e.g. Law and Hassard 1999) even tried to call an end to it as an approach. This was due primarily to the fact that so many researchers had adopted and translated it into their own terms that it had morphed into something else. However, it has since re-emerged. Currently, the best-known introductory texts are Latour (1988a, 1993, 1999a), Barry (2001), Mol (2003), and Law (2004a). Latour’s *Re-assembling the Social* (2005) is perhaps the most recent introductory text. Articles outlining central areas of concern within the method are found in Callon (1986b, 1998), Callon and Latour (1992), Czarniawska (2004, 2009), Latour (1987, 1988a–d, 1992, 1994, 1996a–c, 1997, 2000, 2002, 2004), Law (1992, 1997,

1999, 2002, 2004b–d, 2007, 2008), Law and Singleton (2005), Mol and De Laet (2000), and Mol and Law (1994, 2004).

ANT overlaps with a number of intellectual traditions, so some of its central concepts may seem familiar. For instance, in a positive sense, it shares practical links with other approaches (as mentioned in Latour 1997, 2005), including:

- Thomas Hobbes’ (1660) notion of Leviathan
- Gottfried Leibniz’s (1714) monads
- Denis Diderot’s (1769) conception of réseau
- Friedrich Nietzsche’s (1883) overall notion of will-to-power
- Gabriel Tarde’s (1895) definition of social, in contrast to Durkheim’s (1895)
- Alfred North Whitehead’s (1919, 1925, 1929) philosophy of science
- Algirdas Julien Greimas’ (1966) generative semiotics
- Harold Garfinkel’s (1967) ethnomethodology
- Michel Serres’ (1969, 1972, 1974, 1982) philosophy of science
- Michel Foucault’s (1975) analysis of micro-powers
- Gilles Deleuze and Félix Guattari’s (1980) rhizome
- Thomas Hughes’ (1983, 1986) seamless webs
- Donna Haraway’s (1991) cyborgs
- Karen Barad’s (2003) notion of matter-ing and agential realism (see Law 2004c)

However, in a more negative sense, *ANT* shares links with Bloor’s (1976/1992) strong programme and Heidegger’s (1927) ‘*Things*’—negative, in the sense that in Heideggerian phenomenology, *Things* are filtered through Dasein and portrayed as relatively conflict-free gatherings (Feenberg 2003; Harman 2007b). In contrast, actor-networks may involve conflict and exist outside of the purview of human Dasein (Latour 1988; Latour and Weibel 2005; Harman 2007a, 2009). Additionally, whereas Bloor (1976) and others (e.g. Collins and Yearley 1992) argue for a symmetrical treatment of the sociological explanation of truth and error in scientific knowledge construction, which essentially means using social realism to explain away science, scientific rationality, objectivity and nature (see Dolwick 2008), actor-network theorists argue for a different view, one that involves the analytic levelling of the ontological categories of ‘social’ and ‘natural.’

Specifically, Latour (1999b–c, 2005) argues against the dualist paradigm within sociology, which describes two separate ontological universes, but privileges only one. The extension of the principle of symmetry within actor-network theory simply means that all relations are inextricably intermixed. Or, as Latour (2005, p. 76) puts it: “*ANT* is not, I repeat not, the establishment of some absurd symmetry between humans and nonhumans. To be symmetric, for us, simply means *not* to impose a priori some spurious *asymmetry* among human intentional action and a material world of causal relations.” This means that the ‘social world’ cannot be used to explain away the ‘natural-material world’ (and vice versa), since it is all just one world. Trying to extract one from the other is an epistemological nightmare. In this sense, it is not necessary to try to purify subjects from objects. If, ultimately, truth or error in science and technology depends (at least in part) upon the actions of objects, then it makes no sense to leave them out of the explanation, or to pretend that they matter and make a difference only in some instances. An entire project may rest upon whether or not an object (thing) actually does what it is supposed to do. Of course, this may not always be entirely clear. Therefore, in trying to explain the settlement of a scientific or technological controversy, it may be necessary to refer to the objects using the logic and reasoning of the scientists and engineers. This is something that is discouraged within the strong programme. For adherents of Bloor’s symmetry postulate, such

as Collins and Yearley (1992), this means bowing to the hegemony of science, since scientific rationality will always appear to outweigh whatever social reasoning they provide. However, as Callon and Latour (1992) see it, not only does this help them to better represent their ‘subjects,’ the *actors*: the scientists, engineers, and multiple objects of their work, but also it acknowledges the fundamental importance of ‘objects’ within the so-called ‘social world’ of humans. Of course, here, the subject versus object divide is not the issue. The whole point of doing such research, as Latour (1999b, p. 20) points out, is not to debunk the views of their ‘subjects,’ but rather to ‘*learn from the actors*’ without imposing on them an a priori definition of their world-building capacities.

Another issue concerns the concept of human agency. Much like the notion of ‘social’ above, ‘agency’—the capacity to act and matter and make a difference in the world (Knappett and Malafouris 2008, p. ix)—is seen to involve a vast assortment of actors. More specifically, it is interpreted as an interactive (or *intra-active*) performance that is spread-out and extended through webs of materialised relations (Fig. 7) (Law 2008; Law and Mol 2008). In this sense, it is regarded, not as a unique human quality or force, which acts upon the world, but as an action that is shared with the world. This does not mean that objects ‘control’ social action. Indeed, no actor has complete control over a state of affairs. Anyone who has ever locked their keys out of the car while it is still running, or struggled to build something without proper tools, or tried to organise an event around the weather and ten other people’s schedules, will know exactly what this means: a number of little things may matter and make a difference. Anything and everything may be a potential mediator. More importantly, social action is something that has to be accounted for through empirical means (Latour 2005). That is, a researcher must be able to follow a trace of some prior activity, and include references to at least some of the objects (artefacts) that were used to do something (or that mattered and made a difference in some way). Unfortunately, this tends to confound scholars who want to define agency primarily in terms of intentionality. For others, the idea that human beings share their agencies with things is merely an attempt to de-humanise humans, a return to the hardcore determinism of the natural and technological variety. However, it is important to note that within *ANT* the idea is not to dehumanise humans, or to reduce them to mechanistic forces, but rather to *add* nonhumans to sociological and anthropological studies. Thus, the focus for them is not on the ‘object’ (in isolation), but on the ambivalent subject-object imbroglio, defined as ‘actor-network.’



Fig. 7 Subject, object, human being, or cyborg? Maritime archaeologist Dr Lucy Blue is an actor-network

So, What *are* Actor-Networks?

Instead of using standard sociological labels, *ANT* researchers use a different set of terms. ‘Actor-network’ is an open concept, much like the Deleuzean rhizome (above), which may be used to refer to anything and everything:

- *Actor*—(or *actant*) (e.g. person, group, idea, material object, plant, animal, etc.) is something that acts, or to which activity is granted by others. It may not necessarily be the source of an action, but something that modifies a state of affairs by making a perceptible difference. Additionally, it may have as many dimensions as it has attachments. Thus, an actor may be regarded as an intricate ‘network’ in its own right (Latour 2005, pp. 71, 129; Law/Mol 2008).
- *Network*—(e.g. person, group, idea, material object, plant, animal, etc.) is an interactive assembly of actors, group, or ‘string of actions’ involving a number of potential mediators. More importantly, a network must leave a physical trace of some prior activity, which can be followed by a researcher and recorded empirically. Such a trace is made noticeable by conflict/controversy, flows of translation, labour, effort, movement and production (Latour 1997, 2005, p. 128).

Generally speaking, both terms are interchangeable: an actor may be viewed as a network, and a network may be viewed as an actor. For instance, a sixteenth century Portuguese carrack (Law 1987, pp. 114–116) may be viewed as simultaneously an *actor* within a much wider network, such as the spice trade, and a *network* of wood planks, mast(s), sailcloth, crewmembers, investors, wind, stars, and navigational equipment, etc. (Fig. 8). In turn, each of these actors may be regarded as networks, and so on. The spice trade itself may even be viewed as an actor in other networks, such as the Arab market and Portuguese empire.

This is the same as saying *everything* is important. Everything, no matter how big or small, human or nonhuman, has the potential to be an actor. And, every actor is intricate, a dynamic assemblage in its own right, so try not to take anything for granted. Instead of simply transporting effects without transforming them, even the smallest of actors, the tiniest germ, may bifurcate, spread out, and become an event for a new translation (Latour 2005, p. 128). The world is a series of interactions and negotiations, differences, chains of translation, trials of strength and compromises. No actor is inherently strong or weak. Strength comes from associations. Or, as Latour (1988, p. 163) notably puts it: “nothing can be reduced to anything else; nothing can be deduced from anything else; everything may be allied to everything else.” In such a way, *ANT* deals with analytical units that are more than one, but less than many.

But, who gets to decide what actors are in a network? Obviously the researcher, since he or she gets final say, but then also the actors, since the *ANT* maxim is ‘*follow the actors*’ (Callon et al. 1986, p. 4): listen to what they have to say; take a look at what they are doing; give them the benefit of the doubt; and try to provide accurate representations of their beliefs and actions. Unfortunately, this is extremely difficult. But, this is where *ANT* shares links with ethnography. In fact, one could even call it ‘ethnography extended to nonhumans’ (Anderson 1994). Seeing as how the idea is to learn from the actors, research begins with five sources of uncertainty, concerning the nature of: (1) groups, (2) actions, (3) objects, (4) facts, and (5) how to write research accounts (Latour 2005).

- (1) *Groups*—This concerns what actors were assembled together. Using available sources of evidence: e.g. newspaper articles, court records, interviews, physical marks



Fig. 8 Portuguese carrack before the wind (Source: Brueghal, Pieter. p. 1550. National Maritime Museum, London)

left on artefacts, is it even possible to talk about ‘social’ groups? If it is, then, how is that so? Are there little identifiable marks, lists of ingredients, nameplates, or makers’ signatures on the artefact, linking it to other actors? From where are all of the little pieces and parts coming: are they coming from ‘Location-A’ or ‘Location-B,’ or both/neither? What about ages and approximate dates? Were all of the little pieces and parts, at one point, moving together at the same time, in the same space? What translations between mediators generated traceable associations? Being able to identify a ‘group’ is tricky. Official groups, such as the Provisional Irish Republican Army, League of Women Voters, and Republican Party, have a tendency to change their boundaries, pick up new members, shift and reform. By the time a researcher gets to a site, a group may have already changed its course, or dissolved, leaving little trace of its activities. However, here, it is not ‘social groups’ or even ‘cultures’ and ‘society’ that need to be investigated, but the work of ‘*group making and unmaking*’ (Latour 2005, p. 28). So, after having identified an actor, it is necessary to ask: what other actors were assembled around it? How were they being organised? What allies were they picking up, enrolling? What actors were resisting? What special category labels were they placing on one another, and how were they attempting to organise the rest of the world?

- (2) *Actions*—This concerns the concept of agency, or rather taking what the actors have to say seriously. When an action cannot be directly observed, what do the available sources of evidence suggest? What work was required to induce two or more potentially disagreeable actors into coexisting (perhaps even acting together)? What tools and techniques were used? What physical processes were involved? What did the authors of the written accounts have to say? What were the referenced actors doing? Was there a controversy brewing, or some topic of concern? What special negotiations and translations were being made, and which ‘agencies’ were being invoked; i.e. were the actors talking about gods/spirits, laws of nature, military forces, or the coercive powers of legal courts? Ultimately, are we dealing with ‘causes’ and their intermediaries or a concatenation of little mediators? (Latour 2005, pp. 62, 43–62)
- (3) *Objects*—Since the idea here is not to separate people from things, this involves recognising the participation of ‘nonhumans,’ artefacts, animals, plants, things, etc., in the course of an action. What is a ‘person’ or ‘human being’? The ANT answer is an ever-shifting, heterogeneous assemblage. People act with all sorts of things, from puffs of air to satellites. Besides performing practical tasks, objects help to stabilise, mediate, frame, articulate, enforce, and give meaning to action. They even help us form identities. In this sense, ‘we’ (humans) are already hybridic collectives—we do not exist without things. But, far from being the mere hapless bearers of symbolic projection, objects (things) have the potential to exist within their own little webs of materialised relations, outside of the purview of phenomenological observers. They may even surprise, resist, or cause problems for other actors. So, which objects were being enrolled into (or removed from) an assemblage? How were they being combined, mobilised and dispatched? What objects were the actors mentioning in their written accounts? What about the ones they omit, i.e. what do the archaeological site contexts suggest? What were these things doing or not doing? Ultimately, were they mattering and making a difference in the course of some other agent’s action or not? (Latour 2005, pp. 71, 63–86)
- (4) *Facts*—This concerns how to tell the difference between a ‘matter of fact’ and a ‘matter of concern.’ Certainly, all sorts of ‘facts’ exist in the world. For instance, ‘social facts’ are relevant to sociologists and philosophers, while ‘natural facts’ are (perhaps) more pertinent to natural scientists. Of course, some facts are meant to be universal. With that in mind, a matter of fact is a relative certainty, something that is stable and unquestioned, perhaps even taken for granted, while a matter of concern is a source of uncertainty, a controversy, an argument over what exists. But, here, it is not matters of fact that are important, but matters of concern. That is, an actor may call into question even the most stable of facts, turning it into a controversy, a building site for something entirely new. An explosion may occur, a virus may mysteriously spread, an explorer may reach an unknown territory, changing the way we view the world. So, in the actors’ accounts, which facts were being disputed and made matters of concern? Which ones were being challenged, and which ones were standing up to and surviving those challenges? (Latour 2005, pp. 87–120)
- (5) *How to write research accounts*—Finally, after having identified what actors were assembled together, what actions were involved, what objects were making their presence known, and being mobilised, and which facts were being disputed (or not), the fifth source of uncertainty concerns the actual writing of textual accounts, which Latour (2005, p. 129) describes as a ‘test’ of how many actors a writer is able to treat as mediators, and how far he or she is able to achieve the tracing of associations. In

this sense, a ‘good’ textual account is one that traces a ‘network,’ a string of actions, where each participant does something. This is the whole point of doing research: of collecting and sorting through newspaper articles, of tediously going through court records, of conducting interviews, and of painstakingly identifying marks on artefacts. This is the point of trying to see: who was doing what (and ‘what’ was doing what), how they were doing it, where and when all of this was going on, and why. As Latour (2005, p. 131) notes: “a network is an expression to check how much energy, movement and specificity our own reports are able to capture. It is a concept, not a thing out there. It is a tool to help describe something, not what is being described.” Network is similar to an exploratory rhizome. It is meant to help the researcher see how social units are related and arranged (or rather to see their potentialities). This is why Latour at one point wanted to call *ANT*, ‘actant-rhizome ontology.’ Ultimately, the point of writing research accounts and using a ‘network’ metaphor is to be able to show all of the hard work that went in to making something: a technology, a science, an artefact. It is a way of *accounting for the social*. Thus, here, *social* is not a special ingredient, or domain of reality, implying humans only. Instead, it refers to associations of radically heterogeneous actors.

Obviously, these five sources of uncertainty do not add up to the entire method. For instance, in *Re-assembling the Social*, Latour (2005, p. 165) discusses additional tactics for ‘flattening the social,’ i.e. for dealing with questions of social context. He also reviews ‘localising the global’ and ‘globalising the local,’ two ideas for turning the notion of social forces into local matters of concern. That is, for Latour, there is no global versus local issue in social theory. Instead, everything must have some local source. For instance, in order for a law originating in New York to take hold in Timbuktu, there must be some local agent in Timbuktu faithfully following and enforcing it. And, even then, there may be many discrepancies between the New York understanding of the rule and the way it is implemented and followed in Timbuktu.

But, this does not mean that everything is reducible to the local either. In fact, *simultaneity* is difficult to achieve. This is because ‘local’ (e.g. ‘face-to-face’) interactions tend to overflow with elements that come from other times, places and spaces: e.g. the clothes we wear, the words we use, the walls that surround the rooms in which we live and conduct business, the technologies we rely on, etc., were all produced at other times, in other places, by people-and-things that are not immediately present (Latour 1996b: 231). Consequently, any number of actors may have an impact on social relations. In fact, if one were to try to draw a map of all of the actors present in any interaction, at any particular moment in time, instead of a well-demarcated frame, one would produce a highly convoluted network with a multiplicity of diverse dates, places and people. This is why it is extremely important to try to ‘flatten out’ the social as much as possible, so that one may see the many chains of actors.

John Law has also written a book, *After Method: Mess in Social Science Research* (2004), which covers many of the same issues. In fact, in reviewing the multiple articles and book chapters on *ANT*, it is difficult to provide a short summary. Certainly, Latour’s philosophy is at odds with other theorists (see Harman 2009 for a more comprehensive discussion of Latour’s unique ‘object-oriented’ philosophy). It is also different from other *ANT* researchers. For instance, Callon, Law, Mol, etc., have slightly different interpretations, some of which are more ‘fluidic’ than others (see Fig. 1). But, as actor-network theory continues to change, tackling new topics and problems, hopefully its mantra will

remain the same. The important thing to note is that *this* is the approach that provides an active role for just about everything.

The Status of Material Objects (Artefacts) within Social Archaeology

But, how do archaeologists define ‘social’? Currently, within archaeology, there is some confusion as to how to treat artefacts, plants, animals, and other nonhumans under the heading ‘social.’ Two examples of this are Preucel and Meskell (P&M) (2004) approach to social archaeology and Webmoor and Witmore (W.W.) (2008) approach to symmetrical archaeology (following *ANT*). Essentially, both are contradictory in the sense that each uses a different version of the concept. P&M’s way of defining ‘social’ is similar to that of *human aggregates*, while W&W’s approach is comparable to that of *associations*. Thus, there is some conflict between the two.

In their opening editorial to Part I of *A Companion to Social Archaeology*, P&M (2004, pp. 3–17) define their version as:

Social archaeology refers to the ways in which we express ourselves through the things that we make and use, collect and discard, value or take for granted, and seek to be remembered by...it is linked to how we conceptualize the relationships between ourselves and others, society and history in both past and present contexts. It involves an appreciation of the multiple entailments of our very being-in-the-world.

Here, social archaeology involves an appreciation of ‘our’ very ‘being-in-the-world.’ Most of their editorial is dedicated to describing different social constructivist and phenomenological approaches, mainly those found in sociology, anthropology, postmodern geography, and archaeology. Their central message is that we should try to overcome the debilitating modernist divides between subject/object, mind/body, culture/nature, and so on. As they see it, Anglo-American archaeology has gone through three broad engagements with social theory: ‘the social and the cultural,’ ‘the social and social theory,’ and ‘the social and contemporary society.’ But, aside from these three phases, they want to introduce their own version of social, which they call ‘social being.’ Defined in such a way, they see it as involving three broad categories:

- (1) Temporality
- (2) Spatiality
- (3) Materiality

All three are used to emphasise the centrality of human consciousness in the social construction of time, space, and material culture. And, all three are based on the writings of Heidegger (1962), Husserl (1970, 1977), and Merleau-Ponty (1964), the leading phenomenologists. In addition, they have drawn inspiration from other theorists, mainly Bourdieu (1977) and Giddens (1979) as well as an assortment of Marxist scholars.

The first category, temporality, concerns the phenomenological notion of Time. In this sense, P&M make it clear that Time and temporality are not the same. Whereas time in physics is a component of a measuring system, temporality in social archaeology is to be seen as a kind of innate sense, or “temporal imaginary,” ultimately grounded in how people “articulate with both the linear and recursive elements of their lived experience” (p. 9). The second category, spatiality, refers to the phenomenological notion of space. This also has to do with human perception, or rather with “conceptions of space” that are created through “material practices and processes in the reproduction of social life”

(p. 12). And finally, the third category, materiality, refers to the phenomenological notion of matter. As with the other two categories, this is also based on an understanding of human consciousness. They also cite the theoretical influences of Marx and Bourdieu (pp.14–16). Here, P&M point out that materiality is to be seen as one of the central areas of archaeological inquiry. As such, they note (p. 16):

The challenge posed by the study of materiality entails deconstructing our own notions of objects and subjects as discrete and essential entities that inhabit particular, impermeable worlds. Recent writing on the specific contours of agentic objects or fetishes, as interlocutors between persons, things, and worlds, undermines the fixity of our imposed boundaries. Meskell (2004) cautions that we should acknowledge that *humans create their object worlds, no matter how many different trajectories are possible and how subject-like objects become*. Materiality manifests a presence of power in realizing the world, crafting thing from non-thing, subject from non-subject. This affecting presence is shaped through enactment with the physical world, projecting or imprinting ourselves into the world (Armstrong 1981, p.19). Studies of materiality cannot simply focus upon the characteristics of objects but must engage in *the dialectic of people and things* (my emphasis).

However, as W&W (2008) see it, this last statement is problematic. In their view, P&M's approach is overly humanistic (even contradictory) in the sense that it emphasises the notion that we should try to 'overcome' the Cartesian divides, but then stresses dialectics, phenomenology and social constructivism. Consequently, instead of overcoming the divides, P&M are really just privileging the human social side of a fictional subject versus object divide. As W&W (2008, p. 57) note:

The problem is that, despite hoping to move beyond, never mind transcend or resolve, 'impermeable worlds,' Meskell and Preucel are still taken in by the enchantment of the social and the modernist priority of humans as the locus of action sanctioning it. Their assessment of materiality, the topic most surely amenable to taking matter seriously, ends by claiming that '*humans create their object worlds, no matter how many different trajectories are possible or how subject-like objects become*'...Without a doubt, the editors are right to keep us from regressing back to an occult of the 'object'...but '*dialectics*' will not advance a novel manner of understanding people and things (my emphasis).

In their view, archaeology's subject matter should be about hybrids, people-and-things, action, force, matter, space and time, and not just about human consciousness and perception. As they (2008, pp. 58, 64) see it, P&M's focus on temporality, spatiality and materiality actually just forefronts 'the social' as the primary causal ingredient of 'the material.' Thus, rather than a *synthesis* of two extreme positions, one gets a vague notion of 'social' defined as human perception or phenomenological consciousness spread across the divides. The problem with *dialectics* is that it does not begin with a *mixture*. And, this is precisely where W&W want to begin.

Conclusion

And this is where I need to end. So, what is the social? In this paper, I reviewed several different theories and argued that sociologists and classical/contemporary social theorists

have had a tendency to push artefacts (and artefact-use) over to the sidelines of action. Plus, I introduced a ‘new’ *social* approach, one that does not force humans and things apart. In this sense, it is not necessary for us to set up an opposition between things and people, or rather between ships and boats, on the one hand, and the human social, on the other. Within *ANT*, an actor (actant) may be anything: an insect, a boat, a person, a government, the unconscious, a virus, etc. Furthermore, actors are relationally linked with one another in webs or networks. They make a difference to each other. They make each other *be*. Why is this important for maritime archaeology? It allows us to study just about anything—including ships and boats.

Acknowledgements I would like to thank the anonymous reviewers as well as Jon Adams, Fraser Sturt, Kieran Westley, Ruth Plets, John Murray, David Fesz, Jeff Bogniard, Joseph Iorillo of the Freedonia Group Inc, and especially R. Christopher Dolwick of Allen Memorial Medical Library for their comments, suggestions and advice throughout this research. Additionally, I would like to thank Timothy Webmoor and Christopher Witmore for sending me an advanced copy of their 2008 article. I also want to thank Niels Albertsen and Bülent Diken. And, finally, I would like to thank my family: Professor Michael C. Silk, Ruth Shane Silk and Winnifred Shane Burruss, for their encouragement and support.

References

- Adams J (2006) Editorial article: from the water margins to the centre ground. *J Mari Archaeol* 1(1):1–8
- Albertsen N, Diken B (2003) What is the social? Department of Sociology Lancaster University, Lancaster. <http://www.comp.lancs.ac.uk/sociology/papers/Albertsen-Diken-What-Is-The-Social.pdf>. Accessed 21 Oct 2006
- Albertsen N, Diken B (2006) Society with/out organs. In: Fuglsang M, Sorensen BM (eds) *Deleuze and the social*. Edinburgh University Press, Edinburgh
- Anderson RJ (1994) Representations and requirements: the value of ethnography in system design. *Human-Comput Interact* 9:151–182
- Armstrong RP (1981) *The powers of presence: consciousness: myth and affecting presence*. University of Pennsylvania Press, Philadelphia
- Barad K (2003) Posthumanist performativity: toward an understanding of how matter comes to matter. *Sign J Women Cult Soc* 28(3):801–831
- Barry A (2001) *Political machines: governing a technological society*. Athlone Press, London
- Bascom J (1895) *Social theory: a grouping of social facts and principles*. Thomas Y. Crowell & Company Publishers, New York
- Bataille G (1933/1979) The psychological structure of fascism. *New Ger Criti* 16:64–87
- Bauman Z (1991) *Modernity and ambivalence*. Polity Press, Cambridge
- Bauman Z (1993) *Postmodern ethics*. Blackwell, Oxford
- Bauman Z (1999) *In search of politics*. Stanford University Press, Stanford
- Bennett J (2004) The force of things: steps toward an ecology of matter. *Polit Theory* 32(3):347–372
- Berger PL, Luckmann T (1967) *The social construction of reality: a treatise in the sociology of knowledge*. Anchor, New York
- Bloor D (1976/1992) *Knowledge and social imagery*. Routledge and Kegan Paul, London
- Bloor D (2000) Collective representations as social institutions. In: Pickering WSF (ed) *Durkheim and representations*. Routledge, London
- Bloor D, Edge D (2000) For the record. *Soc Stud Sci* 30(1):158–160
- Bourdieu P (1977) *Outline of a theory of practice*. Cambridge University Press, Cambridge
- Bourdieu P (1985) The social space and the genesis of groups. *Soc Sci Inf* 24(2):195–220
- Bourdieu P (1986) The forms of capital. In: Richardson JE (ed) *Handbook of theory of research for the sociology of education*. Greenwood Press, New York
- Bourdieu P (1988) *Homo academics*. Polity Press, Cambridge
- Bourdieu P (1990) *The logic of practice*. Stanford University Press, Stanford
- Bourdieu P (1991a) Language and symbolic power. Harvard University Press, Cambridge
- Bourdieu P (1991b) The peculiar history of scientific reason. *Sociol Forum* 6(1):3–26
- Bourdieu P (1992) *An invitation to reflexive sociology*. University of Chicago Press, Chicago
- Bryant CD, Peck DL (2007) *21st century sociology*. Sage Publications, London

- Callon M (1986a) Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. In: Law J (ed) *Power, action and belief: a new sociology of knowledge?* Routledge, London
- Callon M (1986b) The sociology of an actor-network: the case of the electric vehicle. In: Callon M, Law J, Rip A (eds) *Mapping the dynamics of science and technology: sociology of science in the real world*. Macmillan Press, London
- Callon M (1998) Actor-network theory: the market test. In: Law J, Hassard J (eds) *Actor network and after*. Blackwell, Oxford
- Callon M, Latour B (1981) Unscrewing the big leviathan: how do actors macrostructure reality. In: Knorr K, Cicourel A (eds) *Advances in social theory and methodology: toward an integration of micro and macro sociologies*. Routledge, London
- Callon M, Latour B (1992) Don't throw the baby out with the bath school! A reply to collins and yearly. In: Pickering A (ed) *Science as practice and culture*. University of Chicago Press, Chicago
- Callon M, Law J, Rip A (1986) *Mapping the dynamics of science and technology: sociology of science in the real world*. Macmillan Press, London
- Castree N (2002) False antitheses? Marxism, nature and actor-networks. *Antipode* 34(1):111–146
- Clark TN (1969) *Gabriel tarde on communication and social influence*. University of Chicago Press, Chicago
- Cole GDH (1920) *Social theory*. Frederick A Stokes Co, New York
- Colebrook C (2002a) *Gilles Deleuze*. Routledge, London
- Colebrook C (2002b) *Understanding Deleuze*. Allen & Unwin, Crows Nest
- Collins H, Yearley S (1992) Epistemological chicken. In: Pickering A (ed) *Science as practice and culture*. University of Chicago Press, Chicago
- Craib I (1997) *Classical social theory: an introduction to the thought of Marx, Weber, Durkheim and Simmel*. Oxford University Press, Oxford
- Czarniawska B (2004) On time, space and action nets. *Organisation* 11(6):773–791
- Czarniawska B (2006) Bruno Latour: reassembling the social: an introduction to actor-network theory. *Organisation* 27(10):1553–1557
- Czarniawska B (2009) Emerging institutions: pyramids or anthills? *Organisation* 30(4):423–441
- Deleuze G (1995) *Negotiations 1972–1990*. Columbia University Press, New York
- Deleuze G, Guattari F (1972/2000) *L'Anti-Oedipe*. Les Editions de Minuit, Paris
- Deleuze G, Guattari F (1980) *Mille Plateaux*. Les Editions de Minuit, Paris
- Diderot D (1769) *Le rêve de d'Alembert*. <http://perso.wanadoo.fr/fatalisme>. Accessed 30 Mar 2009
- Dolwick J (2008) In search of the social: steamboats, square-wheels, reindeer and other things. *J Mari Arch* 3(1):15–41
- Drysdale JP, Drysdale SH (2007) The history of sociology: the North American perspective. In: Bryant CD, Peck DL (eds) *21st century sociology*. Sage Publications, London
- Durkheim E (1895/1982) *The rules of the sociological method*. The Free Press, New York
- Eisenstadt SN (2007) Some reflections on the crisis in sociology. *Sociol Inq* 44(3):147–157
- Evans D (1996) An introductory dictionary of Lacanian psychoanalysis. Routledge, London
- Evans D (2005) From Lacan to Darwin. In: Gottschall J, Wilson DS (eds) *The literary animal: evolution and the nature of narrative*. Northwestern University Press, Evanston
- Fahlander F (2001) *Archaeology as science fiction: a microarchaeology of the unknown*. University of Gothenburg, Göteborg
- Fairbanks A (1901) *Introduction to sociology*. Charles Scribner's Sons, New York
- Feenberg A (2003) Critical evaluation of Heidegger and Borgmann. In: Scharff RC, Dusek V (eds) *Philosophy of technology*. Wiley-Blackwell, Hoboken
- Fitzgerald AJ (2006) The reification of the culture/nature dichotomy in classical social theory: implications for the study of animals and society. Paper presented at the annual meeting of the American sociological association, Montreal Convention Centre, Montreal, 11 Aug 2006. http://www.allacademic.com/meta/p102800_index.html. Accessed 28 Mar 2009
- Foucault M (1975) *Discipline and punish: the birth of prison*. Panthéon, New York
- Freeman LC (2006) Editing a normal science journal in social science. *Bulletin de Méthodologie Sociologique* 91:8–19
- Gallie WB (1956) Essentially contested concepts. *Proc Aristot Soc* 56:167–198
- Gareau BJ (2005) We have never been human: agential nature, ANT, and Marxist political ecology. *Cap Nat Social* 16(4):127–140
- Garfinkel H (1967) *Studies in ethnomethodology*. Prentice Hall, New Jersey
- Giddens A (1979) *Central problems in social theory*. Macmillan, London
- Giddens A (1984) *The constitution of society*. Blackwell, Oxford

- Giddings FH (1896) *The principles of sociology: an analysis of the phenomena of association and of social organisation*. Macmillan and Co, New York
- Gillette JM (1916) *Sociology*. AC McClurg & Co, Chicago
- Goffman E (1959) *The presentation of self in everyday life*. Doubleday and Anchor Books, New York
- Greimas AJ (1966/1983) *Structural semantics: an attempt at a method*. University of Nebraska Press, Lincoln
- Hagerty JE (1907) Points of agreement among sociologists. *Am J Sociol* 12:649–651
- Haraway D (1991) *Simians, Cyborgs and women: the reinvention of nature*. Routledge, New York
- Harman G (2007a) The importance of Bruno Latour for philosophy. *Cult Stud Rev* 13(1):31–49
- Harman G (2007b) Heidegger explained: from phenomenon to thing. Open Court, Chicago
- Harman G (2009) *Prince of networks: Bruno Latour and metaphysics*. Re. Press, Victoria
- Heidegger M (1927) *Being and time*. State University of New York Press, New York
- Hobbes T (1660/2004) *The leviathan*. Kessinger Publishing, Whitefish
- Hodder I (2004) The social in archaeological theory: an historical and contemporary perspective. In: Preucel RW, Meskell L (eds) *A companion to social archaeology*. Blackwell, Oxford
- Hughes T (1983) *Networks of power: electrification in western society 1880–1930*. Johns Hopkins University Press, Baltimore
- Hughes TP (1986) The seamless web: technology, science, etcetera, etcetera. *Soc Stud Sci* 16(2):281–292
- Husserl (1970) *The crisis of European sciences*. Northwestern University Press, Evanston
- Husserl (1977) *Cartesian meditations*. Kluwer Academic Publisher, Amsterdam
- Irigaray L (1985) *Speculum of the other woman*. Cornell University Press, New York
- Islam N (1983) Sociology, phenomenology and phenomenological sociology. *Sociol Bull* 32(2):134–152
- Islam N (1984) The paradigmatic status of sociology. *Soc Sci Rev* 1:130–157
- Islam N (1987) American sociology: crisis in isolation. *Bangladesh J Am Stud* 1:67–71
- Islam N (2008) Sociology: from science to pseudo-science? *Bangladesh E-J Sociol* 5(2):5–18
- Jacobsen MH, Poder P (2008) *The sociology of Zygmunt Bauman: challenges and critique*. Ashgate, London
- Kimble RG (1899) Contributions to the comparative study of association. *Am J Sociol* 4(July):666–680
- King M, Thornhill C (2003) Will the real Niklas Luhmann stand up, please: a reply to John Mingers. *Sociol Rev* 51(2):276–285
- Knappett C, Malafouris L (2008) Material and nonhuman agency: an introduction. In: Knappett C, Malafouris L (eds) *Material agency: towards a non-anthropocentric approach*. Springer, New York
- Lacan J (1966) The insistence of the letter in the unconscious. *Yale Fr Stud* 36:112–147
- Lacan J (1981) Kant with Sade. *October* 51:55–75
- Lacan J (1986) *The four fundamental concepts of psychoanalysis*. Penguin, London
- Lacan J (1992) The ethics of psychoanalysis: the seminar of Jacques Lacan. Book VII. Routledge, London
- Lacan J (2005) *Ecrits: the first complete edition in English*. WW Norton, New York
- Lacan J, Mehlman J (1972) The purloined letter. *Yale Fr Stud* 48:39–72
- Latour B (1988a) *The pasteurisation of France*. Harvard University Press, Cambridge
- Latour B (1988b) *Irreductions: part II of the pasteurisation of France*. Harvard University Press, Cambridge
- Latour B (1988c) A relativistic account of Einstein's relativity. *Soc Stud Sci* 18(1):3–44
- Latour B (1988d) The politics of explanation: an alternative. In: Woolgar S (ed) *Knowledge and reflexivity: new frontiers in the sociology of knowledge*. Sage, London
- Latour B (1992) Where are the missing masses? Sociology of a few mundane artefacts. In: Bijker W, Law J (eds) *Shaping technology, building society: studies in socio-technical change*. MIT Press, Cambridge
- Latour B (1993) *We have never been modern*. Harvard University Press, Cambridge
- Latour B (1994) Pragmatogonies: a mythical account of how humans and nonhumans swap properties. *Am Behav Sci* 37(6):791–808
- Latour B (1996a) *Aramis or the love of technology*. MIT Press, Cambridge
- Latour B (1996b) On interobjectivity. *Mind Cult Act* 3(4):228–245
- Latour B (1996c) Pursuing the discussion of interobjectivity with a few friends. *Mind Cult Act* 3(4):266–269
- Latour B (1997) On actor network theory: a few clarifications. <http://www.nettime.org/Lists-Archives/nettime-l-9801/msg00019.html>. Accessed 28 Mar 2009
- Latour B (1999a) *Pandora's hope: essays on the reality of science studies*. Harvard University Press, Cambridge
- Latour B (1999b) On recalling ANT. In: Law J, Hassard J (eds) *Actor network and after*. Blackwell, Oxford
- Latour B (1999c) For David Bloor and beyond: a reply to David Bloor's Anti-Latour. *Stud Hist Phil Sci* 30(1):113–129
- Latour B (2000) When things strike back: a possible contribution of science studies to the social sciences. *Br J Sociol* 51(1):107–123

- Latour B (2002) Gabriel tarde and the end of the social. In: Joyce P (ed) *The social question: new bearings in history and the social sciences*. Routledge, London
- Latour B (2004) Why has critique run out of steam: from matters of fact to matters of concern. *Crit Inq* 30(2):25–248
- Latour B (2005) *Reassembling the social: an introduction to actor-network theory*. Oxford University Press, Oxford
- Latour B, Weibel P (2005) *Making things public: atmospheres of democracy*. MIT Press, Cambridge
- Law J (1986) On the methods of long distance control: vessels, navigation and the Portuguese route to India. In: Law J (ed) *Power, action and belief: a new sociology of knowledge?* Routledge, London
- Law J (1987) Technology and heterogeneous engineering: the case of Portuguese expansion. In: Bijker W, Hughes T, Pinch TJ (eds) *The social construction of technological systems: new directions in the sociology and history of technology*. MIT Press, Cambridge
- Law J (1992) Notes on the theory of the actor network: ordering, strategy and heterogeneity. Published by the Centre for Science Studies, Lancaster LA 4YN, UK. <http://www.comp.lancs.ac.uk/sociology/papers/Law-Notes-on-ANT.pdf>. Accessed 30 Mar 2009
- Law J (1997) Traduction/trahison—notes on ANT. Published by the Centre for Science Studies, Lancaster University, Lancaster LA1 4YN, UK. <http://www.lancaster.ac.uk/sociology/stslaw2.html>. Accessed 30 Mar 2009
- Law J (1999) Materialities, spatialities, globalities. Published by the Centre for Science Studies, Lancaster University, Lancaster LA1 4YN, UK. <http://www.comp.lancs.ac.uk/sociology/papers/Law-Hetherington-Materialities-Spatialities-Globalities.pdf>. Accessed 30 Mar 2009
- Law J (2002) Objects and spaces. *Theory Cult Soc* 19(5/6):91–105
- Law J (2004a) After method: mess in social science research. Routledge, London
- Law J (2004b) Enacting naturecultures: a note from STS. Published by the Centre for Science Studies, Lancaster University, Lancaster LA1 4YN, UK. <http://www.comp.lancs.ac.uk/sociology/papers/law-enacting-naturecultures.pdf>. Accessed 30 Mar 2009
- Law J (2004c) Matter-ing: or how might sts contribute? Published by the Centre for Science Studies, Lancaster University, Lancaster LA1 4YL, UK. <http://www.comp.lancs.ac.uk/sociology/papers/law-matter-ing.pdf>. Accessed 30 Mar 2009
- Law J (2004d) Disaster in agriculture: or foot and mouth mobilities. Published by the Centre for Science Studies, Lancaster University, Lancaster LA1 4YL, UK. <http://www.comp.lancs.ac.uk/sociology/papers/law-disaster-mobilities-foot-and-mouth.pdf>. Accessed 30 Mar 2009
- Law J (2007) Actor network theory and material semiotics. Version of 25 April 2007. <http://www.heterogeneities.net/publications/Law-ANTandMaterialSemiotics.pdf>. Accessed 18 May 2007
- Law J (2008) On sociology and STS. *Sociol Rev* 56(4):623–649
- Law J, Hassard J (1999) *Actor network and after*. Blackwell, Oxford
- Law J, Mol AM (2008) The actor-enacted: Cumbrian sheep in 2001. In: Knappett C, Malafouris L (eds) *Material agency: towards a non-anthropocentric approach*. Springer, New York
- Law J, Singleton V (2005) *Organisation* 12(3):331–355
- Leibniz GW (1714/1925) *The monadology and other philosophical writings*. Oxford University Press, Oxford
- Luhmann N (1982) *The differentiation of society*. Columbia University Press, New York
- Luhmann N (1986) *Ökologisch Kommunikation*. Westdeutscher Verlag, Opladen
- Luhmann N (1987) The evolutionary differentiation between society and interaction. In: Alexander JC, Giesen B, Münch R, Smelser NJ (eds) *The micro-macro link*. University of California Press, Los Angeles
- Luhmann N (1990) *Essays on self-reference*. Columbia University Press, New York
- Luhmann N (1995) *Social systems*. Stanford University Press, Stanford
- Luhmann N (1997) Globalisation or world society: how to conceive of modern society. *Inter Rev Sociol* 7(1):67–80
- Luhmann N (2000) *Art as a social system*. Stanford University Press, Stanford
- Merleau-Ponty M (1964) *Signs*. Northwestern University Press, Evanston
- Meskel L (2004) *Object worlds in ancient Egypt*. Berg Publishers, Oxford
- Mol A (2003) *The body multiple: ontology in medical practice*. Duke University Press, Durham
- Mol A, De Laet M (2000) The Zimbabwe bush pump: mechanics of a fluid technology. *Soc Stud Sci* 30(2):225–263
- Mol A, Law J (1994) Regions, networks and fluids: anaemia and social topology. *Soc Stud Sci* 24(4):641–672
- Mol A, Law J (2004) Embodied action, enacted bodies: the example of hypoglycaemia. *Body Soc* 10(2–3):43–62
- Nietzsche F (1883/1917) *Also Sprach Zarathustra*. Modern Library, New York

- Pinch T, Bijker W (1987) The social construction of facts and artefacts: or how the sociology of science and the sociology of technology might benefit each other. In: Bijker W, Hughes T, Pinch TJ (eds) *The social construction of technological systems: new directions in the sociology and history of technology*. MIT Press, Cambridge
- Preucel RW, Meskell L (2004) *A companion to social archaeology*. Blackwell, Oxford
- Ross EA (1910) *Foundations of sociology*. Macmillan Company, New York
- Schutz A (1932) *Der sinnhafte Aufbau der sozialen Welt: Eine Einleitung in die verstehenden Soziologie*. Springer, Vienna
- Scott J (2007) Sociology and the social: a qualified defence of sociological imperialism. In: Urry J, Dingwall R, Gough I (eds) *What is 'social' about social science?* 21st Century Soc 2 (1):95–119
- Serres M (1969) *Hermes I. La communication*. Minuit, Paris
- Serres M (1972) *Hermes II. L'interference*. Minuit, Paris
- Serres M (1974) *Hermes III. La traduction*. Minuit, Paris
- Serres M (1982) *The parasite*. Johns Hopkins University Press, Baltimore
- Seto I (2006) Organisation of knowledge and the hyperlink: Eco's the name of the Rose and Borges' the library of Babel. *Libr Stud J* 1. <http://www.librarystudentjournal.org/index.php/ljsj/article/view/34/36>. Accessed 28 Mar 2009
- Strum S, Latour B (1986) Human social origins: please tell us another story. *J Sociol Biol Struct* 9:169–187
- Tarde G (1895) *Monadologie et sociologie. Les empêcheurs de penser en rond*, Paris
- Turner JH (2001) *Handbook of sociological theory*. Springer, New York
- Turner JH (2007) *Sociological theory in the 21st century*. In: Bryant CD, Peck DL (eds) *21st century sociology*. Sage Publications, London
- Van de Noort R (2006) Introduction to social maritime archaeologies. Theoretical archaeology group conference. University of Exeter, 15–17 December 2006. <http://sogaer.exeter.ac.uk/archaeology/tag/sessions/vandenoort.shtml>. Accessed 01 Apr 2009
- Webmoor T, Witmore CL (2008) Things are us: a commentary on human/things relations under the banner of a social archaeology. *Nor Archaeol Rev* 41(1):1–18
- Whitehead AN (1919) *An enquiry concerning the principles of natural knowledge*. Cambridge University Press, Cambridge
- Whitehead AN (1925) *Science and the modern world*. Macmillan Company, New York
- Whitehead AN (1929/1978) *Process and reality: an essay in cosmology*. Free Press, New York
- Zellweger PT, Mangan A, Newman P (2002) Reading and writing fluid hypertext narratives. *Proceedings of the thirteenth ACM conference on hypertext and hypermedia*. ACM, New York
- Žižek S (2006) *Interrogating the real*. Continuum, New York
- Žižek S (2007) *How to read Lacan*. WW Norton, New York

Copyright of *Journal of Maritime Archaeology* is the property of Springer Science & Business Media B.V. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.