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Medieval Urban Environment: Between Mental and Material Practices

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ABSTRACT

This article raises the question of how natural conditions and social practices interacted and provided groundbreaking premises for the development of the medieval urban physical environment. The main hypothesis is twofold: (a) that social practices in medieval urban communities are entangled with natural processes, (b) that mentality, knowledge and experience as elements in social practices are fundamental to the comprehension of the development of physical environment in medieval towns. The article introduces elements from social practice theory to outline a theoretical framework. The article also invokes a study of urban ecosystems in which the term ‘social-ecological system’ (SES) places intentions, meaning and symbolic constructions to the forefront of the study of urban environmental development. By using empirical examples from two medieval Norwegian towns, Trondheim and Bergen, I aim to elucidate how the urban population shared norms and concepts which were key prerequisites for how urban physical environment developed through the Middle Ages.

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Introduction

What kind of facts and sources, theoretical approaches and multidisciplinary competence do we need to study the dynamics of environment and environmental changes during the medieval urbanisation process? And what elements should we include in this analysis, and for what reasons and with what consequences for our understanding of the influential forces that created and recreated the urban environment in and around medieval towns?

My main theoretical point of departure is that social life in the past creates and recreates a proliferation of loose ends which get entangled and routinised through the practices of daily life. These are processes going on in vast networks of extreme complexity, and studying them demands cooperation between archaeologists, historians and other scholars with relevant interests and expertise. It is of the utmost importance to develop research strategies that empower us to gain a non-reductionist understanding of how society and nature, humans and non-humans, entangle as players in the social practices of everyday life. One way to study this is to define, describe, and analyse how patterns of social practice are integrated with the metabolic mechanisms both in towns and between the towns, their near surroundings, and the more distant hinterland. In this article, I will briefly touch upon the question of how medieval urban environment

and its development can be described within social-ecological system (SES) thinking; secondly, I will combine this with elements taken from social practice theory; and, thirdly, illustrate, through an example from medieval Trondheim and Bergen, how mentalities, knowledge and experiences influence the urban environment as actants in daily social life.

The overarching aim of this article is to guide the current discussion about medieval urban environment beyond quantifiable data and pure scientific analyses. I do not, of course, dismiss such processes as unimportant in the discussion of the creation of the medieval town’s physical environment, but I argue for the importance of incorporating an appreciation of the mental landscape in the analysis. My hypothetical starting point sets, i.a. a focus on how the human mental landscape, although for obvious reasons not necessarily the same for all people, acted as an actant in the complex network within which the social practices of the medieval towns unfolded, by offering those involved in this network normative guidelines for performing actions and interventions. This calls upon a comprehension of urban ecology which goes beyond the traditional understanding of this term – focusing as it does on such things as the driving forces in ecological processes which led to inappropriate, unsustainable urban environmental conditions. Below I will introduce an alternative concept of ecology.

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An Alternative Concept of Ecosystem

The traditional use of the term ‘ecosystem’ denotes a community of living organisms in conjunction with the non-living components of their environment, interacting as a system and linked together through nutrient cycles and energy flows and controlled by external and internal factors. This conceptual understanding of an ecosystem is widespread and frequently used by biologists, as well as within the humanities, but in essence this ecosystem paradigm is based on a worldview that sees humans and nature as separate from, and in conflict with, each other (Plessis 2008, 12). Chrisna du Plessis is strongly critical of the well-established definition of ecosystem rooted in a mechanistic paradigm that sees the earth as a machine, with parts of this machine able to be addressed separately, based on the assumption that if all the individual parts are in place and working the whole system will be sustainable and maintained in a state of equilibrium (Plessis 2008, 10). ‘Ecosystems are described as though they follow a linear evolutionary process towards a steady-state climax community’ she states (Plessis 2008, 17). Her critique rejects the traditional understanding of the term ecosystem because it disregards human actions and their influence in all their social, cultural, mental, and material diversity. An alternative conceptual approach is to understand the relationship between nature and culture as social-ecological system (SES). The advantages of this alternative way of ecological thinking are that it sees humans as components of ecosystems, and that ecosystems are conceived as open, unpredictable and dynamic systems (Plessis 2008, 11–15). There is an ongoing discussion about what, essentially, needs to be encapsulated in an SES approach regarding understanding how nature and culture become entangled in urban communities. I will not expand on this discussion in detail here, but some of the main propositions that have been claimed as being essential can be briefly highlighted as follows: a social-ecological system

- is an integrated system that spans matter, life, human social and cultural phenomena and human mentality,
- is differentiated from other systems by the introduction of abstract thought and symbolic construction,
- consists of relationships between elements at several scales and within nested systems,
- is complex and adaptive, with properties of self-organisation and emergence.

Chrisna du Plessis has pointed out that the synthesis of this framework consists of two distinct, nested, domains of existence, the ‘biosphere’ and the ‘noosphere’ (Plessis 2008, 15). In archaeology, the

‘biosphere’ concerns the biological preconditions for living and environmental adaptation, and the ‘noosphere’ concerns the whole range of socially, culturally and mentally dependent processes. A decisive question is, however, whether these two ‘domains of existence’ exist as fully integrated elements in the SES or whether they act as parallel preconditions for human ‘being in the world’. If it be the latter, how has this interaction taken place, within which contexts, and with what consequences for the environment and for people? To get closer to these questions, it is helpful to take a brief look at recent research on the crucial relationship between ‘Nature’ and ‘Culture’. This will, in turn, prepare the way for a non-reductionist explanation of how the relationship between society and environment is perceived and explained. As we shall see, a fruitful approach could be to take a closer look at the concept ‘natureculture’ which, although a constructed concept, clearly captures the overarching recognition that nature and culture are entangled entities.

Nature and Culture Entangled in the Social Practices of Everyday Life

The intriguing consequence of Chrisna du Plessis’s system-theory based categorisation of ‘domains of existing’ is that it derives from the long-existing ontological division between nature and culture, or human and non-human life. Opposed to this stand, for example, is Donna Haraway’s Manifesto from 2003, which states that ‘cyborgs and companion species each bring together the human and non-human and [...] nature and culture in unexpected ways’ (cited in Latimer and Miele 2013, 7). Such an outlook opens for opportunities to approach the interaction between society and the physical environment along new trajectories, and to search for interaction between nature and culture that hitherto has been only vaguely perceived. The essential meaning behind Haraway’s statement is that Nature, defined as the physical world and everything in it – such as plants, animals, mountains, oceans, stars – and Culture, defined as the characteristic features of everyday existence – such as diversions or a way of life shared by people – appear as separate, parallel entities rather than two intertwined elements in everyday life. This entangled structure of basic human conditions – nature and culture – is conceptualised in the phrase ‘naturecultures’. Although it is an ambiguous and rather blurry concept, it can be utilised experimentally as a tool to examine how nature and culture interact as hybrid objects and, eventually, how the interactions between natural and cultural are essentially context-dependent and determined by sociocultural power mechanisms (Johansson 2015). The dynamic forces which make this happen are manifold and ambiguous, but basically



Figure 1. Bottom of a latrine outside an economy building in the rear part of the courtyard AD 1275-1325. Library site, Trondheim, Norway. Photo: Riksantikvaren / NTNU University Museum.

rooted in people's shared experiences, knowledge, mentality and emotions. Mentality, even in its broadest sense, is a challenging concept for archaeologists and historians to handle empirically, as the environmental historian Christian Rohr rightly emphasises (Rohr 2003). The concept covers, according to Rohr, the sum of all the factors determining 'the possibilities (and also the impossibilities) of thinking and acting in a given society or in parts of that society' (Rohr 2003, 128). Another crucial concept relevant to how nature and culture become intertwined is emotion: traditionally emotion is defined as personal affect and is therefore to be seen as something that prevents, or at least militates against, logical reasoning, and is thus different from cognition. But, as Latimer and Miele (2013) have pointed out, affective processes, in the sense of being moved or feeling affected, are also important in establishing social practices and are thus encapsulated in cognitive processes. If we accept this, we must accept that a personal state of feeling has a significant impact on personal, and even public, attitudes, actions and interventions (Figure 1).

Above we have briefly presented the following hypothetical points of departure: (a) mentality, emotions, knowledge and experience play a significant part in how nature gets entangled in everyday social practice, and (b) nature and culture are hybrid 'states of being' which play the role of actants in open network intersections. This hypothetical approach, briefly summarised within the narrow framework of this article, provides the environmental framework for how we will argue for (a) a non-reductionist understanding of transformation processes in the medieval town's physical development, and (b)

urban social practice's key role in the creation and recreation of the urban environment (Rawcliffe 2013; Hoffman 2014; Fay 2015; Geltner 2012). Before we proceed, it may be appropriate to give a brief overview of what is going on in current archaeological research in the field of medieval urban development.

Some Current Trends in Medieval Urban Ecosystem Research

The study of how past landscapes, human societies, and the natural environment interact within urban communities is defined and executed by research disciplines such as environmental history and archaeology. In 2014, Richard Hoffmann posed the paramount question: How is environmental history possible? (Hoffman 2014, 6–11). He refers to the 'interaction model', which was initially presented by American environmental historians during the 1980s and which acknowledges the interaction between man and nature. Hoffmann is aware of the fact that environmental historians ask questions about environmental influences, attitudes towards nature, and human impacts on the natural world. Accordingly, he perceives society, artefacts, and beings as 'hybrids' that participate with invisible agency in the natural environment. Hoffmann thus establishes access to a broad understanding of the complex processes that create disturbances in ecosystems' interaction patterns. His hybrid approach is a big step towards an integrated understanding of culture as an active element in ecosystems. This tangled relationship between nature and culture has been discussed and nuanced by other scholars, among them Haraway

(2003), Latimer and Miele (2013), Johansson (2015), and de Souza and Costa (2018).

Environmental history and archaeology should, as Richard Hoffmann exemplifies, comply with the standards and aims set by SES. In an article published in 2017, Murphy and Fuller summarise current directions in environmental archaeology (Murphy and Fuller 2017). Initially, they define the broad scope of environmental archaeology as a subfield of archaeology that incorporates all aspects of how humans altered and affected the natural environment in the past, on the basis of datasets derived from remains of organisms, soils and sediments from sites of past human activities (Murphy and Fuller 2017, 1). Based on a short historiographical review, they conclude that while environmental archaeology matured during the 1980s and 1990s as a result of more extended methodological discussions and greater attention to problems related to assemblage formation, it has since, thanks to internal debates of some intensity about data and methods, experienced a growing separation from mainstream archaeology. According to Murphy and Fuller, environmental archaeology has entered a fourth phase, characterised by attempts to win acceptance for a key role for archaeological results that are relevant to research on climate change, landscape ecology and conservation, human diet, and Anthropocene studies in general. They suggest that the many new techniques that offer high-definition datasets will ease the way to this goal. In particular, the ‘big data revolution’ facilitates handling not only large amounts of data but also extensive variation and high velocity – all considered appropriate and fruitful as tools to search for new data that can be used to correlate events and circumstances such as climate change and regional and cultural variations. Albeit not a complete status survey, the ‘big data revolution’ ticks many of the boxes on a checklist of main trends in current environmental archaeology, which has initiated data capture, big data analysis, and applied high-definition methods as major fields of research interest. Ecological analysis which includes social activities and daily life routines in the urban communities is, however, only present in this recent research trend to a less degree (Figure 2).

In a short and factual article from 2013, Roberta Magnusson gives a brief overview of the wide range of sources available for the study of medieval urban environments, and of the main topics within such a study. Her list of research topics includes external environmental forces as well as the dynamic forces originating from the social construction of urban communities. This brings us a great step nearer a comprehension of ecological processes which includes not only biological, climatological, physiological and geological factors, but also factors derived from daily practice patterns created by social life and behaviour. With this, she takes a position that is close to



Figure 2. An organised rubbish heap with wooden frames along a narrow lane AD 1250–1300. Erling Skakkes gt.1 site E vest/1972, Trondheim, Norway. Photo: Riksantikvaren / NTNU University Museum.

Hoffmann’s description of environmental development as a hybrid process, where humans and nature are closely intertwined. Magnusson also underpins the importance of a multidisciplinary approach and the need for generalist publications that provide syntheses based both on texts and on material evidence. Of interest to urban archaeologists is her point that ‘cities which have both abundant records and full-time archaeological units’ are the best candidates for such in-depth studies of individual urban ecosystems and their synchronic and diachronic variations (Magnusson 2013, 193). The examples presented in this article are taken from Bergen and Trondheim, two medieval towns which belong to Magnusson’s ‘elite-town category’. So far, however, little research has been done on medieval urban ecosystems where elements like meaning and mentality, knowledge and experience are actively involved in the study. In order to carry out such research, a practice theoretical approach is relevant, because practice theory describes how knowledge, experience, norms and concepts intertwine with the physical environment in daily practice patterns. This theoretical point of departure enables us to describe and analyse how the mental and material worlds are entangled in the medieval urban population’s daily life – this

being the pivotal point for the transformation of the urban physical environment.

In the following, I will contribute to an elucidation of the overall discussion by presenting empirical examples from the medieval towns of Trondheim, a coastal town in central Norway, and Bergen, a Hansa-town on the west coast of Norway and the largest town in Norway during the Middle Ages. The aim is to show how particular norms and concepts – of pure and impure, pollution and hygiene – were deeply embedded in the medieval mentality and were thus decisive for people’s perceptions, and how, moving on from this, they were encouraged to react, or remain passive, in response to events and processes in the physical urban environment. To do this I will introduce some basic thoughts and concepts taken from social practice theory based on Andreas Recwitz’s (2002); Ted Schatzki’s (1996, 2009) and Elisabeth Show’s (Shove, Pantzar, and Watson 2012) works.

Social Practice Patterns and the Dynamics of Medieval Urban Ecology

It is customary to discuss towns as places that have a recognisable demographic structure, physical form, and functions, since many people live in close proximity in a dense urban landscape, and they practise trades, distribute goods, and safeguard some central functions for the surrounding rural areas (Benevolo 1993; Nicholas 1997; Carelli 2001; Helle 2006, 2009; Anderson 2017). In sum, the town’s material environment and its social and productive life represent agreed solutions to the challenges encountered by its residents in their everyday life at home, at their workplace, and so forth. In this regard, the town should be understood as performed: the town developed through the unpredictable exercise of social practice in a material environment as a particular social space, in which countless practices are intertwined in patterns, bundles, and complexes that combine to form a particular recognisable urban lifestyle – in sum, urbanity (e.g. Christophersen 2015, 112–114; Larsson 2017). Subsequently, the approach suggested here is to see the town as an assemblage of social practices entangled through countless actions and events. In this respect, ‘a town’ is a place where a multitude of everyday practices create specific patterns which link together in bundles and connect with each other in even bigger complexes (Shove, Pantzar, and Watson 2012, 84–87).

Shove, Pantzar, and Watson (2012) have developed a set of analytical tools that (1) describe a model of how practice forms, develops, and disintegrates, (2) describe and explain the relationships between the basic elements of social practice formation and the processes that bind them, and (3) explain how social practice shifts from individual experiences to

experiences shared by a community. Their key approach is that social practice is created by material, meaning, and knowledge elements (Shove, Pantzar, and Watson 2012, 22–25). Patterns of practice emerge when the elements become linked together in a mutually bound community and are performed as a stabilised or reproducible practice, and they become extinct when the connections between the elements dissolve or some of the elements are replaced with elements that add new meaning, new knowledge or new experiences. The archaeologist might gain insight into this performative town space as ‘materialized urban practices’, through the material remains that include everything from DNA, micromorphological sediment samples, pollen, parasites and skeletons to pottery, house remains, latrines, sewers and churches. This conceptual version of social practice theory offers a huge analytical potential for anyone wanting to gain a better understanding of the many different, but entangled practices that we have to identify, examine, and analyse in order to determine how they led to an awareness of the need for interventions in urban communities – interventions, for example, to mitigate the risks posed by a filthy environment, or to deal with polluted water, or to provide care for the sick or aged poor, or to establish adequate nutrition standards and fair pricing, etc. Carole Rawcliffe’s research, which is based on an analysis of a wide range of primary sources, clearly shows that rulers of English towns were eager to remove what they perceived as potential threats to public health, although they had limited financial resources and a weak infrastructure for implementing the major projects that they believed would result in urban environmental improvement (Rawcliffe 2013). During the Middle Ages, there was a shift in focus to public responsibility for the benefit of all townspeople’s health, and Rawcliffe shows what this shift in social responsibility and political ideology did for the will to improve the urban environment. This mental and political shift in the public managing of urban health and environmental challenges is discussed by Guy Geltner (2012), and has also been noted by Gunn Westholm (1990) in her discussion of the management of water and waste in the town of Visby on Gotland: ‘The contemporary image of the medieval urban environment typically is dominated by a grossly simplified template, a notion that medieval people completely lacked insight into questions concerning constructive solutions to sanitation problems’ (Westholm 1990). To stress the necessity to understand the contemporary concepts of cause and effect, Rawcliffe underlines the connection between religion and public health care by stating: ‘The sanitary, social and religious agendas pursued by the rulers of the late medieval and early Tudor English towns formed a coherent and inseparable whole, as closely interconnected as the networks of natural,

vital and animal spirits that coursed around the human body' (Rawcliffe 2013, 97). Rawcliffe stresses the importance of actively understanding how meaning, in the sense of mentality, and knowledge played a dynamic part in the establishment of an urban ecological system which could enhance the public health status of medieval towns by adequate interventions and management systems. In this context, mentality and knowledge represent conscious or intuitive insights, including marginal and less expected levels of insight such as bodily experience, belief, habit, and customs. These categories of 'knowledge-like products' are identical to Recwitz's practice-element category 'knowledge' (Reckwitz 2002, 253–254) and close to Ted Schatzki's use of 'rules' which encompasses formulated instructions, directives, admonishments and the like (Schatzki 2009, 39; Shove, Panzar, Watson 2012, 23–24). These practice-theoretical categories facilitate studies of how a social-ecological system is basically a complex of performed and routinised practice patterns, in which humans and materials are connected and mutually influence each other. Rawcliffe's statement that 'networks of natural, vital and animal spirits that coursed around the human body' is essential for an understanding of how the urban environment is about more than consumption patterns, sanitation, waste management, and making ecological footprints in the urban hinterland. Fundamentally, it is about how a medieval urban environment is socially and culturally constructed. This does not indicate, however, that I underestimate the need for more knowledge about pre-industrial urban ecological systems, or sophisticated investigations of hygiene, sanitation and waste management systems and standards. My concern is that the social practices derived from performing intentions, knowledge, and meaning are given the same analytical focus as the laws of nature, social organisation and technical interventions when one is trying to come to an understanding of the driving forces behind the development of the urban environment. Urban environmental threats were either neglected or ignored, or, worse still, exacerbated by the way everyday urban social practice contributed to nature and culture becoming tightly entangled, and in this way unconsciously creating an 'unruly' urban ecological system. This unfortunate process was not due to lack of knowledge alone, but to a paralysing mixed perception of nature, body, mentality and action. Therefore, to quote Ian Hodder, the analytical focal point should be 'the totality of the links which hold and produce events, things, humans' (Hodder 2012). Let us see how these considerations can bring us closer to the intriguing issue of how the urban physical environment at any time was created and recreated through a continuous entanglement of human and non-human daily activities.

Late Medieval Trondheim and Bergen: Managing Waste in a Changing World

In Trondheim there was no formal implementation of public health policies until around the 1670s. Within which explicit social, economic and cultural contexts did this principle of public health management derive? The main hypothesis in the project 'Medieval Urban Health – from private to public responsibility' is that the principle of public health care and governance in Norway comes from a number of specific practices and interventions aimed at preventing contagious processes and improving the urban environment. Archaeologically, we can approach this hypothesis by studying physical interventions implemented in the urban landscape, directly or indirectly, aimed to prevent, or at least to reduce, the dissemination of contagious diseases. Below I take a closer look at one of the most momentous practices for the physical urban environment, which played a significant role in the medieval urban metabolism, and which in fact had a negative impact on environmental sustainability – namely the management of waste disposal and cleanliness of the public space.

Trondheim originated around a natural harbour during the first half of the tenth century AD. Due to land rise, the harbour lost its function during the second half of this century, and the harbour basin, now a dried-out seashore, was filled out with waste material from the surrounding household and building activities. Most of the early inhabitants around this early harbour came from the rural surroundings of Trondheim, and their waste disposal practice followed traditional routines: the rubbish was disposed of close to where people lived. In this case, they threw it out into the harbour basin (Christophersen 2020, 222–224). Two hundred years later, this area, centrally located in the medieval town, was called 'Saurlid', i.e. 'the sludgy slope', in Snorre's *Heimskringla* (Andresen and Fonnes 1995, 78). This popular naming gives an indication of the area's unattractive properties, and it continued to exist as an open, foul-smelling swampy part of the town until it finally became included in the town's built-up area from the beginning of the twelfth century (Christophersen 2020, 223–224). Saurlid's approximately 2-metre-deep waste deposits give the impression of having been sorted, since, for one thing, human faeces did not occur at all among the deposited waste material. From archaeological records we can, from other excavated areas in the town, observe that bodily waste material was deposited at a distance from areas where there was human activity, more precisely in shallow pits in the ground, together with moss which had been used in lieu of toilet-paper (Chilton 1987, 33; Petersén 1995; Christophersen and Nordeide 1994, 154–155). Manure, on the other hand, seems to

have been taken care of and spread out in the townsmen's small fields outside the town (Øye 1998), while rubbish from daily household activities and the dry waste from building activities and craft production, like wood chippings and slag, were used for the filling and levelling of street sections, building plots, the harbour area, etc. (Reed 1990, 15–25).

Similar archaeological observations have been made in Bergen (Økland 1998). According to Økland, latrines were relocated in the fifteenth century from locations and buildings close to human activities to inhabitants' own shelters in their backyards. This is consistent with the fact that human excrement disappears from the culture layers dating from the fourteenth century, and, interestingly enough, evidence points to this happening first in the wealthier Bryggen area, where the German Hansa merchants lived – people more likely to be influenced by what was happening elsewhere in Europe (Økland 1998, 122). A contextual assessment of the deposition pattern in the cultural layers in Trondheim and Bergen shows that attempts were made to isolate bodily waste at a distance from areas close to human activities, while production – and household waste was deposited, often as thick layers of fill to stabilise streets, pavements, house floors, etc. where people lived and worked. This latter waste was, of course, a threat to the quality of the physical environment. How, and to what extent, did people take precautions against this possible menace? Did they even perceive the growing amount of 'utility waste' as a menace? We know from a statute issued by King Håkon V Magnusson in 1311 that shoemakers and tanners were required to 'throw the bark from the tannery onto the site for all types of refuse' (NgL III, nr. 36b; Blom 1997, 206). In 1317 a public waste heap is mentioned in written sources (Blom 1956, Christophersen and Nordeide 1994, 1569), and in Oslo written sources mention a place for public waste material in 1477 (Nedkvitne and Nørseng 1991, 224).

This written source is strongly supported by archaeological observations, which reveal that in the course of 350–400 years no more than about 2 metres of layers of mixed waste material accumulated in the centre of medieval Trondheim. Considering that the population in the same period reached around 4000 individuals, it is reasonable to assume that some of the refuse from the urban households and from craft production was deposited outside the built-up area at an earlier stage than is indicated by the written sources. From Bergen we know from archaeological observations that waste material was deposited all over the place in the urban landscape, but during the fourteenth century a big common heap was established in Vågsbotten on the outskirts of the town. At the same time archaeological excavations have shown that tiny heaps of household rubbish were

scattered around in the neighbourhoods, but less in the fashionable Bryggen district, where the Hansa merchants lived. Økland argues that this distributional pattern probably indicates a change in the conception of public space and of how the presence of waste and filth should be handled (Økland 1998, 115). A similar development took place in Trondheim during the same period: a dramatic reduction of the culture layers in the second half of the fourteenth century – only tiny layers of sand, gravel and patches of ash represent a continuing activity in the centre of the town after the Black Death and during the next two centuries (Christophersen and Nordeide 1994, 156; Christophersen 2002, 7–9; Christophersen 2020, 355–356). In addition to this evidence from Trondheim and Bergen, almost identical observations about reduced waste material from the late thirteenth century and onwards have been made with relation to many other medieval Scandinavian towns (Andrén 1986). The unanimous explanation for this phenomenon has long been a dramatic population decrease and subsequent reduction in activities – seen as consequences of the Black Death, which swept over the country in the years 1350–1351 (Andrén 1986, 260–262, Christophersen and Nordeide 1994; Christophersen 2020). But this makes no sense since there are only marginal waste deposits in the built-up town area even after the population rapidly increased towards the end of the sixteenth century. From this it is clear that the practice developed whereby it was not only bodily waste material that was deposited in designated places some distance away from human activity, but all kinds of waste, and these places were preferably on the outskirts of the city.

These changes in the routinised practice of waste management in Trondheim, Bergen and probably also Oslo and in towns outside Norway during the fourteenth century and onwards are obviously a result of the introduction of new and/or more demanding routines in waste management (cfr. Andrén 1986, 264f.; Økland 1998, 119; Petersen 2018, 71). I would, though, agree with those researchers who have convincingly claimed that the new 'after the Plague' practice in waste management is profoundly rooted in changes in the urban population's mentality, corresponding with the urban population's attitudes to pure and impure waste (Andrén 1986; Økland 1998, 113–117; Christophersen 2002, 2020, 351–353). Økland argues that waste was gradually perceived as unclean, '... not only in public and sacred spaces, but also in areas with a more general and profane settlement: the stage for the more everyday social life' (Økland 1998, 124). Against this background, a crucial question must be asked: what could have caused this profound change in practice?

In the search for a possible answer, Mary Douglas's frequently cited work about purity and danger (1966),

affords some interesting analytical possibilities for delving deeper into the matter of how natural processes and human cognition, defined as ‘all conscious and unconscious processes by which knowledge is accumulated, such as perceiving, recognizing, conceiving, and reasoning’, interact in SES processes. Douglas convincingly argues that it is essential for every human being to have, or to create, order and cohesion in life. To obtain this, correspondence must be established between the physical surroundings and shared norms and notions of what it is to ‘be in the world’: crucial in this is that right things are in the right places. If this mentally accepted codex is attacked or disputed, it will threaten existential values upon which the mental order rests. The notion of purity and impurity is encompassed in such a mental repertoire. As cognitive objects, they strengthen and express structure and coherence in society. In social practice theory the conceptions of purity and impurity are embedded in the element of ‘meaning’ which is one of the three active elements in a practice pattern (Shove, Pantzar, and Watson 2012). Douglas points to how bodily impurity disturbs and offends mental order, and because of that how it needs to be neutralised and order needs to be restored through the establishment of agreed social practices (Douglas 1997, 22–23). From this I will argue that the signs of change in social practice concerning public waste material, clearly visible in the archaeological remains from the fourteenth century in Bergen and Trondheim, are predominantly a response to disorder between the urban population’s shared mental order related to hygiene standard and the threatening development of the late medieval town’s physical environment.

How the urban population in Trondheim and Bergen (and probably most other Scandinavian towns) mentally categorised pure and impure waste material was embedded in the social practice-element ‘meaning’, and for that reason was a crucial factor in the development of how waste management became practically organised. The physical result of these changes in mental repertoire and social practice is what we are archaeologically confronted with when we observe the different interventions at various times relating to how waste material was managed and to what degree public laws and regulations in this field were complied with by the urban population. It is worth noting that, at the same time as the profound changes in waste management in Trondheim and Bergen took place, many English towns introduced weekly refuse collections, campaigns for piped water and better street paving (Rawcliffe 2013, 354–355).

What current conditions and circumstances in fourteenth century Norway could have led to this mental reorientation? Jörpeland and Beck have carried out an investigation of the changing location of latrines in medieval Nordic towns, suggesting that

new mental attitudes towards bodily impurities rooted in Christian ethics and moral rules could have influenced waste management practices (Jörpeland and Beck (2001) cited in Petersen (2018, 75)). For English towns Rawcliffe (2013) argues that new waste management practices were a response to the general acceptance of the miasma theory – that bad smell caused diseases. Because organic waste produced bad smell, which, according to this theory, triggered disease, the town authorities gradually initiated waste management practices to remove bad, pathogenic odours (Petersen 2018, 76–77). An impetus for this was that people through their daily work experienced bad smell from decaying animal corpses and other foul-smelling organic material and water, and started to reflect on whether this had anything to do with the outbreak and spread of diseases (Rawcliffe 2013; Fay 2015, 35–38; Moseng 2020, 111–112). The nascent understanding of the connection between waste, bad smell and the presence of threatening miasmas ultimately led to a more correct understanding of contagious diseases, but this took several centuries. To prevent miasmas, foul rubbish and waste, dead corpses, polluted or stagnant water in harbours, rivers and canals were no longer generally accepted in the urban environment. In Norway, the first renovation statutes for Oslo came in 1595, and aimed to prevent further harmful pollution of the town’s water sources and to prohibit people from throwing manure, scavengers and other pollutants into the river.

Concluding Remarks

The material remains of past social practices entangled in medieval urban environmental transformation processes are loaded with data that, quite literally, has not yet been fully brought to the surface. Dolly Jørgensen correctly states that ‘the technological artefact is not the entire technological story. By situating these urban technologies within their larger social frameworks, we can see how basic infrastructure was turned into an effective cooperative sanitation system’ (Jørgensen 2008, 567). However, the story continues beyond this ‘how’ because we still have limited insights into how, why and when mentality, meaning and knowledge either pushed or prevented action, i.e. use of ‘technological artefacts’ and ‘basic infrastructure’. We need a deeper and wider comprehension of what new experiences and insight emerged in the medieval urban landscape from the ongoing processes of spatial, material, and sociocultural transformation. Such an approach demands, however, source material of a quality and quantity that cannot be satisfied from archaeology alone. Without a comprehensive, multi-disciplinary approach, there will be limited progress in asking new and challenging research questions and in methodological development. Old sources

will not be challenged in encounters with new data and new information. In a future perspective, I am convinced that an in-depth insight about past living in non-sustainable urban environments, must add knowledge that will be of vital interest, and that can even be relevant for experts planning future cities.

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References

- Andersson, H. 1972. "Centralorter, tätorter, och städer i Skandinavien - några metodiske problem." In *Studies in Historical Archaeology*: Vol. 19. Medeltida urbanisering. Uppsatser 1972-2015, edited by H. Andersson. Lund: Lunds Universitet.
- Andrén, A. 1986. "I städernas undre värld." In *Lund Studies in Medieval Archaeology: Vol. 1. Medeltiden och arkeologin: Festskrift till Erik Cinthio*, J. Wienberg, A. Andrén, M. Anglert, U.-B. Ekstrand, L. Ersgård, B. Sundnér og Anglert, M. (red.), s. 259–269. Lund: Lunds universitet.
- Andresen, K. M., and Ø. Fønnes. 1995. *Norges Kongesagaer*. Oversatt til norsk ved G. Storm. Oslo: LibriArte.
- Benevolo, L. 1993. *The European City*. Oxford: Blackwell.
- Blom, G. A. 1956. *Trondheim bys historie*, bd. 1: St.Olavs by 1000-1537. Trondheim: F. Bruns Bokhandel.
- Blom, G. A. 1997. *Trondheim Bys Historie 997-1997*. Trondheim: F. Bruns Bokhandel.
- Carelli, P. 2001. En kapitalistisk anda. Kulturella förändringar i 1100-talets Danmark. *Lund Studies in Medieval Archaeology*: Vol. 26. Lund: Lunds Universitet.

- Chilton, T. 1987. 676 9718 1833. *Fortiden i Trondheim bygrunn: Folkebibliotekstomten*. Meddelelser: Vol. 11. Trondheim: Riksantikvarens utgravningskontor i Trondheim.
- Christophersen, A. 2002. "Var de alle svin?" *SPOR -Nytt fra fortiden* 17 (1): 4–9.
- Christophersen, A. 2015. "Performing Towns. Steps Towards an Understanding of Medieval Urban Communities as Social Practice." *Archaeological Dialogue* 22: 109–132. doi:10.1017/S1380203815000161.
- Christophersen, A. 2020. *Under Trondheim. Fortellinger fra bygrunnen*. DKNVS Skrifter 2020 nr. 3. Museumsforlaget.
- Christophersen, A., and S. W. Nordeide. 1994. *Kaupangen ved Nidelva. Riksantikvarens samlede skrifter nr. 7. Trondheim: Strindheim Trykkeri*. Trondheim: Strindheim Trykkeri.
- Douglas, M. 1997. *Rent og urent. En analyse av forestillinger omkring urenheter og tabu*. Oslo: Pax Forlag.
- Fay, I. 2015. *Health and the City. Disease, Environment and Government in Norwich, 1200-1500*. York: York Medieval Press.
- Geltner, G. 2012. "Public Health and the Pre-Modern City: A Research Agenda." *History Compass* 10/3: 231–245.
- Haraway, J. 2003. *The Companion Species Manifesto. Dogs, People, and Significant Otherness*. University Chicago Press.
- Helle, K. 2006. "Fra opphavet til omkring 1500." In *Norsk byhistorie. Urbanisering gjennom 1300 år*, edited by K. Helle, F.-E. Eliassen, J.-E. Myhre, and O. S. Stugu. Oslo: Pax Forlag.
- Helle, K. 2009. "Underskogen i samlende perspektiv." In *Strandsteder, utvekslingssteder og småbyer i vikingtid, middelalder og nytid*, edited by J. Brendalsmo, F.-E. Eliassen, and T. Gansum. Oslo: Novus.
- Hodder, I. 2012. *Entangled. An Archaeology of the Relationships Between Humans and Things*. Chichester: Wiley-Blackwell.
- Hoffman, R. C. 2014. *An Environmental History of Medieval Europe. Cambridge Medieval Textbooks*. Cambridge: Cambridge University Press.
- Johansson, Å. 2015. "Natureculture Originated. An Intersectional Feminist Study of Notions of the Natural, the Healthy and the Palaeolithic Past in the Popular Science Imaginary of Biomechanics." ISRN: LIU-TEMS G/GSIC2-A-15/004-SE. Linköping University.
- Jørgensen, D. 2008. "Cooperative Sanitation: Managing Streets and Gutters in Late Medieval England and Scandinavia." In *Technology and Culture*, Vol. 49, No. 3, Water, 547–567. Baltimore: John Hopkins University Press and the Society for the History of Technology.
- Larsson, S. 2017. "Staden som idé." In *Växjö, Kalmar och Smålands tidigaste urbanisering*, edited by M. Anglert and S. Larsson. Taberg, Växjö, Göteborg: Arkeologerna, Statens Historiska Museum.
- Latimer, J., and M. Miele. 2013. "Naturecultures? Science, Affect and the Non-humans." In *Theory, Culture & Society*. Sage. doi:10.1177/0263276413502088.
- Magnusson, R. 2013. "Medieval Urban Environmental History." *History Compass* 11 (3): 189–200.
- Moseng, O. G. 2020. *Pesten kommer. Svartedauden og verdens pestepidemier*. Oslo: Kagge Forlag.
- Murphy, C., and D. Q. Fuller. 2017. "The Future is Long-Term: Past and Current Directions in Environmental Archaeology." *General Anthropology* 24 (1): 1–8.
- Nedkvitne, A., and P. G. Norseng. 1991. *Oslo bys historie*, bd 1. Oslo: Cappelen Forlag.

- NgL=Norges gamle Love indtil 1387 bd.I-V. keyser, Rudolf, Munch, Peter A. et al. Christiania/Oslo 1846–1981.
- Nicholas, D. M. 1997. *The Growth of the Medieval City: From Late Antiquity to the Early Fourteenth Century*. London: Longman.
- Økland, B. G. 1998. “Det ureine avfallet. Ein arkeologisk analyse av avfallshandtering i Bergen 1150–1700.” (Hovedfagsoppgave). Universitetet i Bergen, Bergen.
- Øye, Ingvild. 1998. *Middelalderbyens agrare trekk*. Bergen: Bryggens Museum.
- Petersén, A. 1995. The Nature of Deposits from a Pre-Urban Settlement. An Analysis of the Material from the «Library Site» in Trondheim, Norway. Meddelanden från Lunds universitets historiska museum 1993–1994, New Series, 10 (s. 135–144). Lund: Lunds universitet.
- Petersen, E. K. 2018. «Less mud-slinging and more facts». *En undersøkelse av tiltak knyttet til levevilkår I Oslo i høy- og senmiddelalderen*. (Masteravhandling). Trondheim: NTNU.
- Plessis, C. du. 2008. “Thinking About the Day After Tomorrow: New Perspectives on Sustainable Building.” Paper presented at Rethinking Sustainable Construction 2006 Conference, Sarasota, Florida, USA 19–22 September 2006, pp. 1–23. Online https://www.researchgate.net/publication/30509697_Thinking_about_the_day_after_tomorrow_new_perspectives_on_sustainable_building.
- Rawcliffe, C. 2013. *Urban Bodies. Communal Health in Late Medieval English Towns and Cities*. Woodbridge: The Boydell Press.
- Reckwitz, A. 2002. “Towards a Theory of Social Practices: A Development in Cultural Theorizing.” *European Journal of Social Theory* 5: 243–263.
- Reed, I. 1990. 1000 Years of Pottery. An Analysis of Pottery, Trade and Use. Fortiden i Trondheim bygrunn. Vol. 25. Trondheim: Riksantikvarens Utgravningskontor i Trondheim.
- Rohr, C. 2003. “Man and Natural Disaster in the Late Middle Ages: The Earthquake in Carinthia and Northern Italy on 25 January 1348 and Its Perception.” *Environment and History* 9 (2): 127–149. Accessed January 8, 2021. <http://www.jstor.org/stable/20723281>.
- Schatzki, T. 1996. *Social Practices. A Wittgensteinian Approach to Human Activity and the Social*. Cambridge: Cambridge University Press.
- Schatzki, T. 2009. “Timespace and the Organization of Social Life.” In *Time, Consumption and Everyday Life. Practice, Materiality and Culture*, edited by E. Shove, F. Trentmann, and R. Wiik, 35–48. London: Berg.
- Shove, E., M. Pantzar, and M. Watson. 2012. *The Dynamics of Social Practice: Everyday Life and how it Changes*. London: Sage.
- Souza, M. A. T. de, and D. M. Costa. 2018. “Introduction: Historical Archaeology and Environment.” In *Historical Archaeology and Environment*, 1–15. Springer Link. http://crossmark.crossref.org/dialog/?doi=10.1007/978-3-319-90857-1_1&domain=pdf.
- Westholm, G. 1990. “Gaturenållning och husholdsavlopp – modern service eller medeltida teknik? Om Visbys medeltida stadsmiljö utifrån det arkeologiska materialet.” In *Gotlandia Irredenta. Festschrift für Gunnar Svahnström zu seinem 75. Geburtstag*, R. Bohn (red.), s. 303–323. Sigmaringen: Thorbecke Verlag.