

Sand in the Mapmaking Machinery: The Role of Media Differences

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In this 1766 book *Laokoon*, Gotthold Ephraim Lessing argued that painting should depict bodies in space, whereas poetry should present actions in time [1]. Few involved in the literature or art of our times would accept such a restrictive poetics. The idea that the sign systems we use to create our expressions should always have a comfortable relationship to their objects of reference feels quite foreign to us. We rather see the tension created by pushing at media borders as a fundamental part of how we express ourselves.

Yet Lessing was not only presenting a set of rules for artists and poets based on his own time and temperament. In his summary of Enlightenment ideas, in his conclusion of a discussion with its roots in antiquity, he also pinpointed distinctions which go far beyond the prescriptiveness of his argument. There are indeed differences between visual and verbal media. Different media can be mixed, and various forms of crossover and hybrid works push against and question media differences, but the borders are still there. They are strongly connected to the different sign systems used in visual and verbal expressions.

In this article, I will show how these differences play out for the relationship between texts and maps. I will apply some principles developed on two fiction texts, namely, Daniel Defoe's *Robinson Crusoe* (1719) and Kazuo Ishiguro's *The Unconsoled* (1995) [2].

The aim is to test the applicability of comparison to abstract maps as a way of understanding texts. I will then widen the scope somewhat by highlighting some results from a mapping seminar in June 2015, showing results from a number of mapping exercises based on different texts.

In the area of geographical information, there is a general view that maps are better than texts in storing and communicating information about geography. And this is true, in many cases. But in which cases? Are there cases in which the opposite is true? Lessing argued for the different qualities, the different areas where painting and poetry could work at their best. I make a similar argument for geographical maps and geographical texts. But what does it mean that a text is better than a map in certain ways?

This is not a study of mapping in practice, rather of how inherent media differences and differences in sign systems lead to problems in the mapping process. Some of these problems can be solved in a pragmatic way, whereas others signal fundamental differences between the two media: verbal texts and geographical maps. In any case the mapping exercise feeds back into the source text and changes our understanding of it. Because of their different sign systems and because they can present different if overlapping views of the world, seeing texts in the light of different map visualisations represents an interesting way to get a deeper understanding of geographical space and how it can be mediated.

Body and space

Humans are embodied creatures moving through external landscapes. We are also semiotic animals living in environments of signs [3]. In our interaction with texts, semiotics will often overshadow embodiment, but understanding textual descriptions of landscape is also always based on bodily experiences, even if it may be in very indirect ways. A reader of the novel *Robinson Crusoe* has an understanding of the island on which Crusoe was shipwrecked for many years. That understanding is not based on first-hand experience—that would be impossible, as the island never existed as a physical place. Still, sitting in a chair with a book using hands, eyes, and other parts of the body in the reading process one can feel the heat, the humidity, and the sand. They are felt as bodily memories triggered by the text. The novel also feeds on bodily memories when it builds up the reader's understanding of the descriptions and his or her desire for the plot. Without having experienced the island, one has other bodily experiences that make up important aspects of the understanding of the text.

What if one makes a map of Crusoe's island? In the bodily act of making the map one also uses experiences gained as an embodied creature moving through landscapes. If I were to make such a map I would also use my experience as a map surveyor and drawer. Yet, when I show the map to somebody else the bodily memory of heat, humidity, and sand is called to attention in a different way from what would happen with the novel. Heat and humidity may not be experienced at all, and sand will be less important than travel distances, sight lines, and other spatial relationships between places. My previous research indicates strongly that these differences are systematic. External landscapes seem to be harder than experienced space; our location in space is fairly determinate. However, space is not as fixed as it may seem by looking at a map.

In my research I have used computer assisted conceptual modelling to investigate such differences in detail. What is the significance for personal and cultural memory of translation processes between digital textuality and digital cartography? In computer assisted modelling the algorithmic structures of the computer is forced on the complexity of human experience. The hard edges of a computer model are used to model the less determinate modes of human expressions. In this article computer based modelling is not used directly, but the interpretational system was developed through computer assisted conceptual modelling.

The spaces of Robinson Crusoe

As a starting point for this inquiry, was read and the descriptions in the text were classified according to a typology I have developed [4]. The typology groups text according to the degree to which its geographical information can be expressed on maps and includes the following categories:

1. **Fully specified textual descriptions.** *Only one map can be drawn based on the description. If the text mentions something, it is fully specified geometrically.*
2. **Underspecification.** *Based on such a text, more than one map can be drawn, and at least two of these maps are significantly different.*
3. **Disjunction.** *The text includes expressions in the form 'A or B is located at C'.*
4. **Negation.** *The text includes expressions in the form 'There is no A in B'.*

5. Impossible figures. *The description of the geographical elements does not add up to a spatially coherent whole* [5].

Although a modern reader meets the text of Robinson Crusoe with the expectation of a work of fiction, this is not the way the book was presented when first published. The title page of the first edition presents the text as an autobiography, a narrative of one person's experiences. The alleged truthfulness of the text is similar to any other autobiographical text. However, Defoe's text was criticised for being fantasy from the outset. Today the book is seen as fiction, with its paratextual and textual self-posing as a true narrative being part of the fiction.

The environment is brought into the narration at the different scales: larger and smaller areas as well as objects. There are few descriptions of larger areas. The island, and the location of it, is the largest area described. The vast majority of descriptions fall into the other two scales: small areas, such as Crusoe's house, his yard and the beach, and objects, such as boats, baskets and clothes. Descriptions of objects are bound to be important in the text, as the tools and other objects he is able to salvage from the ship are necessary for his subsistence on the island. One may say that it is not only him as a person with the skills he has, but equally much the quality of his European tools, which makes his work in cultivating the island successful. In this article the focus will be on the former two scales.

Larger areas: place name dropping

Referring to locations and showing routes is a different way of writing from describing landscape, although both are related to place and geography. Travel narratives and landscape descriptions tend to overlap, or at least be used in the same texts, but they are still different things. In the narration of most of Crusoe's longer travels, there are no descriptions at all [6]. Place names considered to be known are used without explanation or description. The same can be seen in his travel after he started his plantation [7]. The places are atoms between which one just moves and their whereabouts and the distances are, to the degree they are important, considered to be known to the reader [8]. For a reader without such basic knowledge the under-specification would be almost total, whereas reading with a map there is no under-specification on the grand scale, although some in the details, such as the exact whereabouts of his plantation in Brazil.

Larger areas than the island are never described, but their place names are mentioned and are expected to be known to the reader. One example of a journey that is rather easy to map is the voyage that was meant to be from Brazil to Africa, when he ended up shipwrecked [9]. There are realistic bearings under normal weather conditions. The positions and directions are indicated, making it easy to follow the route on a chart. Easy, that is, to know what the people on the ship knew. The perspective is always with the narrator or the group he was presented to be a part of. During the storms there are only guesses. It is quite obvious that this gives the narration a realistic touch, using the connection to the known world as an anchor for realism. The minimal departure is reduced to the minimum [10].

The descriptions of places of some size, mostly his island, are not connected to identifiable places, so that they cannot be tested against a real world map. In general, places and relations between them are not described if they can be easily located on maps. There are one or two exceptions to this; one is shown in the discussion of the events in the Yarmouth–Cromer area below. The location of the island is clearly identified, as being south east of Trinidad, north east of the eastern part of Venezuela, but any close identification is hard [11].

Smaller (local) areas: geography building

There are quite a few descriptions of smaller areas in the text. They are always connected to the narrative;

the descriptions are there because they are needed. The exploration of the island on pages is similar [12]. His travel route is described together with important places, but more emphasis is on the plants and animals. He does, however, use cardinal directions on a few occasions. These descriptions of smaller areas play an important role in the narrative. They establish a sort of place name system.

The place name system established by the text consists of what I will call a set of proto place names, and builds up the necessary local knowledge so that the reader can follow the narrative. Crusoe's possession of his land is established in the same process. These two types of results are fundamentally different, as the former one is text external, establishing an understanding in the mind of the book reader, whereas the latter is text internal, describing a process Robinson Crusoe, the character in the book, goes through. Our focus will be on the former of these processes, but it is meaningless to see the one isolated from the other.

A short comment on my use of the concept of place name is in order here. There are almost unlimited numbers of definitions of 'place name'. Many of these connect place names to a lack of semantic meaning of the expression making up the name, as the name is seen as referential only. While it is common to use place names where such meaning is not present, the opposite is also common in many languages. There is, as far as I am concerned, no reason to exclude such meanings in the definition. I will here use the definition of Magnus Olsen:

“A place-name, then, is a word, or word-complex, that within one particular community—no matter whether great or small, but of a certain stability—instantly evokes the idea of one particular place through an association of contiguity” [13].

The development of place names is part of building up knowledge of the general geography of the island, in order to let the narrative do with less and less geographical description as the story develops. We see this clearly in the attempt to sail around the island [14]. Once the understanding of the geography is firmly established, expressions functioning as place names are used to refer to parts of it, as where he uses expressions such as 'our Dwelling' and 'our Creek' [15]. Eventually, these expressions develop into almost iconic forms, which is further used when he is presented as a ruler of an organised society: 'my Castle' and 'my Country Seat' [16]. The place name dropping seen for larger, well known areas can now be applied at the island as well. One may speculate that if the narrative had indeed been a description of true events, some of these proto place names could eventually have developed into ordinary place names.

When the island is further developed in order to produce food for a larger population, the geography is no longer described; it is rather considered to be known to the reader [17]. After the island is left, however, new places visited by Crusoe are again described when necessary for the narrative, as we see in the wolf attack during their crossing into France from Spain [18]. In all these descriptions, as in many more in the novel, there are seemingly no attempts to describe landscape for its own sake. It gives us the impression of being there in order to make us understand the story. The main goal is to narrate a good story and, through that, present good Christian teachings. The landscape is only included to the degree it is necessary to reach these goals.

As for the mental image in the head of a reader, the text includes enough cues to build up a reasonable image. Still, one could assume that the under-specification would lead to very different images in different people's heads, to a large extent based on different bodily experiences. This is only a speculation, however, I have made no empirical studies into reader response. My image, for what it is worth, is not a topographical map, but rather what the landscape would look like if it had been seen from a high point on a nearby island, or from an airplane. When an initial image is established it is, however, hard to correct flaws in the fundamental spatial layout even if new information were added. Such flaws remain in my internal mental image.

Narrative, not mapping

Although travel routes are given by the use of place names from the outset of the text, the first real description of a landscape is connected to the first shipwrecking Crusoe lives through [19]. The landscape just out of Norwich, with the places Great Yarmouth, Winterton and Cromer, is still known today, and the places can all be found on a modern map. While the text is a true description of the landscape as it can be seen on a modern map, the reader may expect a more abrupt change in the direction of the shoreline around Winterton. If one would try to make a map based on the narrative alone, it is quite likely that this map does not have to look very much like the landscape based maps we have. I take it as granted that the shoreline has not changed significantly from the seventeenth century until today.

The Defoe text and a modern map express the landscape differently. We may say that one is true and the other one false. In contemporary culture we tend to believe in the map. A map has a rhetoric of perfection. It is not a perfect representation of the ground, as any cartographer could tell you; for just one thing, the distance between, e.g. a road and a river running next to each other is routinely overrated to improve readability. But the quest for perfection is seen in things like coastlines. They are based on techniques such as aerial photos and measurements, and the goal is a perfect match between any change of direction of a scale relevant for the map in the landscape and the map reproduction of it.

Is this to be true to nature? This difference in how the landscape is experienced is not necessarily between the text as fiction and the map as the conveyer of a one and only truth. If one went to the place, the landscape may look more similar to the text than to the map, especially seen from a situation similar to the one of the Crusoe character. Slopes tend to be overrated by our observations. Overrated, that is, if we accept the slope grade seen on a map as the true one. We tend to do so in the modern Western map-based society, but did they in England in the eighteenth century, or in other times and places?

Description outside the narrative

There are a few descriptions which are not directly connected to immediate action or events, as we see later when Crusoe mounts himself on a high place to get an overview of the island [20]. But they are more or less directly connected to future events in the novel. The descriptions of the planning and the building of his camp are very thorough, although it is only covering quite small areas [21]. It is the closest this text gets to a fully specified textual description.

Shortly afterwards, Defoe gives a general presentation, first of himself and then of the island and what he accomplished there [22]. This is the closest we get to a description not connected to action in the novel. It is a summing up of the first part of the book, and it feels as if the narrative takes a deep breath before the big change is introduced by the naked footstep on the shore. And, indeed, the description ends with the sentence "But now I come to a new Scene of my Life." and the next paragraph opens with

It happened one day, about noon, going towards my boat, I was exceedingly surprised with the print of a man's naked foot on the shore, which was very plain to be seen on the sand [23].

His time in solitary peace was over, the rest of the stay on the island is under the threat of savages, and later, pirates.

One common characteristic in fiction is rule breaking. Lessing's 'rules', to the degree they exist, are often broken. This is one of the ways literature creates its special effects. The borders between the types in the typology presented above are also areas where fiction may play. It is pretty clear that the relationship to place and space in Defoe is different from many real travel narratives. His goals could have been political, religious, economic, and the joy of telling a good story. The function based on this became a narrative with much reli-

gions reflection and an emphasis on practical work, a text which includes the landscape descriptions needed to do that, but no more.

Media modalities

In *Laokoon*, as in numerous other works following in this tradition, the existence of certain art forms has been taken as the starting point. In a recent paper, Elleström takes a different approach. Instead of starting from a set of different media or art forms, he takes a bottom-up approach, starting from a set of media modalities. His set includes four, namely, material, sensorial, spatiotemporal and semiotic modalities [24]. The differences I am discussing here, that is, between texts and maps, fall mainly in the latter two categories [25].

An important part of the process of reading and understanding texts is grasping the spatial organisation of a landscape. This spatiality is expressed in the text in the sequential form of the intended reading process. Even though texts as well as maps have space manifested in the material interface, the way a cognitive space is established differs. Because the spatiality of Defoe's text is not directly connected to the spatiality of the described landscape, the landscape spatiality established in the mind of the reader is a reconstructed virtual space. As for topographical maps, the space manifested in the material interface has a strong similarity to the landscape depicted. This similarity is visible for most modern readers, because the way maps refer to the landscape it depicts is deeply embedded into modern cultures. But again, this may have important culture-specific components.

This is also connected to a second point made by Lessing, namely that what is hidden is not seen. This is closely related to what Wellbery calls the syntax of the medium [26]. It cannot be divided from semiotics, which is the other of Elleström's modalities in which maps and texts show clear differences. Defoe's text and maps we draw based on it use signs differently, as will verbal texts and scaled geographical maps in general [27]. Scaled maps tend to be understandable to anyone with a basic reading ability of such graphical representation, an ability that seems to be either existing or quickly developed by people of all cultures. Numerous examples of this can be found in Woodward and Lewis [28]. It is usually easier to understand space by studying maps than by reading texts.

Playing with Lessing's rules

Lessing's rules did not exist for Defoe, in a very literal sense. Defoe died before *Laokoon* was published. Yet, although *Laokoon* can be read as a poetics, it is based on descriptions of pre-existing texts. Lessing's attacks on the use of French models for German drama, and the suggestion to use English models instead, because the German taste was closer to the English than to the French, is interesting in this context [29].

Now, the fact that a narrative text pauses to give a lengthy description outside the story as the very last thing before the major turning point is bound to have a special effect of meaning [30]. One such meaning may be to slow the narrative down in preparation for a big event. The book has no chapters or parts, which would be a more direct para-textual way to do it. Instead, the shift is made inside the text. This is seeing the description as a temporal feature. Another meaning may be to summarise the first part of the novel in order to get the reader ready for the second one.

However, it is peculiar to note that a print of a footprint in the sand, prepared by a *geographical* description of the island, is located in the spatial centre of the book. In the first edition the preface is on page 1 and the main text starts on page 3. The end of the description and the incident with the naked footprint in the sand is on page 153, and the end of the novel is on page 306. The centrality can also be seen in the number of words before and after the turning point.

Given that this is not a coincidence, does it mean that Defoe must have counted words? Not necessarily. Adjustments could have been made during typesetting, where the number of sheets before and after would be easy to see. People used to the handwriting of manuscripts for printing can also develop a pretty accurate feeling for how much is needed to fill a printed sheet. Using the typeset to do this is very much a spatial act. Given that this was the way it happened: not only did he put the turning point of the novel in the geographical centre of the book seen both as a graphical three dimensional set of pages [31] as well as seen as a one-dimensional string of words, he also did include just before this point the only geographical description in the novel which is not linked to action.

By refraining from all such descriptions in the rest of the text, Defoe signals to the reader that something is about to happen. Putting it in the middle of the novel balances it. So exactly in the middle that it looks like a puzzle. Is it the kind of a joke one would expect from a master of irony? Even if this is not intentional, the fact remains that this is a feature of the text, wherever it comes from. Can coincidence make art? Is it art if it is a result of a coincidence? Even if it is not a conscious part of the writing of the text, it has proved to be part of at least one reading of it. It is there in the text, in principle open for anyone to see.

Ishiguro's travel off the map

In Kazuo Ishiguro's 1995 novel *The Unconsoled* a surreal world is described. Not only space, but also time and personal relationships are presented in a dreamlike, unreal way. In this section I will make a short note on one chapter of the book, where one specific case of surreal landscape description will be discussed. This is a preliminary study into spatial movement in a surreal world as an attempt to see how the way of thinking shown for realist fiction above may also give insight into such a text. Through a study of the movements in chapter 10 of the book I will try to establish how the surreal effect is created and to what extent the unreal or impossible space described can be seen as a semantic or pragmatic phenomenon [32]. Is the space description really a claim for geometrical impossibility or is the experienced strangeness a signal to the reader to look for a real space beyond an envisaged impossibility?

The chapter describes how the protagonist is being taken by car from his hotel in the city to go to a dinner party. They travel through the city and then for a significant period of time out in the countryside until they reach a country house. Then the dinner party goes on for quite a few pages before the protagonist, upon wanting to retire to his room, realises that the dining room forms part of his hotel in the city.

How can we possibly interpret this description? One possibility is that they travelled in a circle. But the text clearly states that the travel went from the city centre and out into the countryside for a significant period of time at good speed, so coming back to the city would mean that the narrator is very unreliable, which does not fit the tone of the text. Another possibility would be that the protagonist and the people around him, that is, the whole dining hall, is transformed or moved from one place to another. But this does not fit well with the textual description. It is clearly stated that the narrator realised that the room was connected to the hotel [33]. There is no transfer or movement, rather the sudden realisation of a fact that has been true all along. So a better interpretation is that we have a non-geometrical, or non-real, space. Thus the dining hall is either in two different buildings far apart from each other at the same time, or the distances are incoherent. Simplified, we have a situation as in figure 1, where the distances between two points are not coherent: the distance from A to B is different from the distance from B to A.

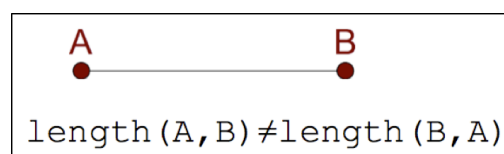


Figure 1. Unreal space.

This situation can clearly be expressed in a text. Ishiguro's book is an example of that, and far from the first example in the history of literature. Such situations are textually expressible but they cannot be conventionally mapped. The syntactics of the geometry based map medium prevents these types of statements from being made. So in trying to map expressions such as this one we not only have a situation of under-specification leading to the map being partly based on choice by the mapper, thus making the map one possible visualisation among others, but we see a situation where the sand in the machinery prevents the mapping exercise from being successful at all. This is a situation where differences in how the media modalities work prevent a media transformation from being possible [34].

Other travels

At the Digital Humanities Summer Institute (DHSI) in Victoria, Canada in June 2015 I taught a course in text mapping as modelling [35]. The students created mapping projects in order to understand better how one can map a text in many different ways, and thus, to what extent the map is based on the interpretation they did of the texts [36]. Groups of students created several maps based on the same text, documenting how different ways of visualising the text led to quite different understandings of the space expressed in the texts. None of the maps were unproblematic but they were all problematic in different ways. In some cases they were seen as useful to highlight certain aspects of the texts, in others the limitations of the maps showed important aspects of the texts, including different levels of specification, which opened up reflections on spaces untouched by the narrative as opposed to places mentioned in the text.

These specificities of the texts were seen in new ways by students who knew the texts well beforehand. And in one case, *Mapping Hemingway's "The Killers" [37]*, the whole idea of creating maps based on the story was, after some attempts, seen as not very useful at all; other ways of re-working the text, including various ways of re-telling it, were seen as more illuminating. Different mapping approaches give different impressions, and even something as seemingly simple as trying to complement a quantitative mapping exercise with a qualitative one can open up a text to new readings. In this way maps can defamiliarise in a way comparable to texts, an effect very different from using a map to show 'how it is' often presented not only in political and historical discourse, but also in the mapping of fiction.

In some texts space is central, but difficult. In those cases it seems to be useful to use different types of maps to highlight different aspects of the text, even if none of the maps are seen as successful mappings. Each new visualisation method had a potential to enhance and manipulate our understanding of the text because different types of maps put different assumptions on the text. The map can indeed hide problems and inhibit discussion. Plotting points on a map makes all places equally accessible, which is quite different from the reading experience. However, a series of different mapping exercises has the potential to counter-work this foreclosure and indeed open up a text to new interpretations. In other cases the map may be easier to make but then it also is less interesting, and almost seen as a waste of time, except for the documentation of the shortcomings of text based mapping.

Sand in the machinery

"Sand in the machinery" is a traditional expression for sabotage. The common use today is as a metaphor based on the mechanical result of putting sand into lubricated metal such as crank wheels. It is comparable in effect to putting sugar in a tank of gasoline. Another similar, but stronger, expression, used in Norway in the 1910s and 20s is "Dynamite in the boreholes." It was used as a threat to prevent strike-breakers from taking up the work of striking miners.

My aim is not to put sand in any machinery, and surely not to cause any explosions, not even metaphorical ones. My aim is rather to point to the fact that there is inherently some sand there, making digital maps

scream a bit in their joints. I hope the previous pages have shown where the sand comes from, what it is, and what the meaning of it may be. But what are the consequences we can draw and what should we do?

Lessing did not have a concept of rule breaking to produce an effect of meaning, but still, this is an important part of art. The rules vary, the level of breaking you need to do varies, but art pushes barriers. In order to be broken, the rule must be there, however. Time paradoxes are, given Lessing's rules, more natural for verbal text than for images. One may easily get the impression that time paradox has been more an object of study for literary critics, and this makes sense, given Lessing's rules. Paradoxicalities was not supported by Lessing, but based on his division of areas of interest for painting and poetry, spatial paradoxes should by analogy be reserved for the plastic arts, to the degree that paradoxes in plastic arts may be compared to paradoxes in literature at all, which is an open question. But it is interesting for space in this discussion, because one could easily think that spatial paradoxes should also be expressed as maps. The problem is that this is not possible, given that a paradox is in line with ambiguity, negation or indeed the impossible space we saw in Ishiguro's novel. Or rather, the only possible way of expressing it on one single static map is as a text on the map.

So maybe text is not only the area of action, of ambiguity and of negation, but also the area of paradox. Maybe the concept of impossible figures should not be seen as a lack of possibilities, but rather a way of opening up language to paradoxical expressions. Such expressions are not available to the cartographer because he lacks the toolbox that the creator of verbal texts has access to.

Aesthetic rules are productive in the sense of producing meaning for effects. The same can be said about media differences. However, some attempts at media transformations create tension based on the different characteristics of the media modalities. One example is that maps are recursive and reflexive (the distance A to B is always identical to the distance B to A) whereas texts are not necessarily so. Other operations, such as negation, also work differently; they operate under different rule sets. It is important to remember that what we usually call the map of a text is not the map of the space of the textual document but rather a map of the reconstructed space established in the mind of an understanding reader of the texts.

Maps can be used for deforming texts [38]. By presenting different maps, different readings of a text can be presented and the understanding of the text by the reader can change. The landscape of a text is created by the reader based on cues in the text and seeing a map which was created based on the text will necessarily change this landscape in the mind of the reader. Different media can express fundamentally different images of the world. An expression based on another expression in another medium will always be an interpretation partly steered by the target medium.

In this article I have tried to discuss what we can say about what the text says, about what in the text is un-spoken, and about what the text cannot speak. This is done in parallel with looking into what the map says, about what of the map is un-spoken, and about what the map cannot speak. Using one medium as a measuring device for expressions in another medium, as I use maps for texts in this article, can give us further insights into the limits to our freedom of expression.

[1] Lessing, G. E. *Laokoon: oder über die Grenzen der Mahlerey und Poesie. Erster Theil.* In K. Lachmann and F. Muncker (Eds.), *Gotthold Ephraim Lessings sämtliche Schriften. Neunter Band* (3rd ed.,) Stuttgart: Göschen. (1893) pp 1-177 (Photographic reprint. Berlin: De Gruyter, 1968). First published 1766.

[2] Eide, Øyvind *Media Boundaries and Conceptual Modelling: Between Texts and Maps.* Houndmills, Basingstoke, Hampshire: Palgrave Macmillan (2015)

- [3] Olsson, Gunnar. *Abysmal: A Critique of Cartographic Reason*. Chicago: University of Chicago Press, (2007).
- [4] Defoe, D. *The novels of Daniel Defoe. 1. The life and strange surprizing adventures of Robinson Crusoe (1719)*. London: Pickering & Chatto (2008). Volume 2 of Robinson Crusoe was not used in this study. The aim is not to present anything new to Defoe experts, but rather to explore new principles for how to examine texts.
- [5] Eide p 115.
- [6] For example the one starting on Defoe p 264.
- [7] Defoe pp 83–84.
- [8] Ingold, Tim. *Lines: A Brief History*. London: Routledge (2007) pp 75–84.
- [9] Defoe pp 87–88.
- [10] The principle of minimal departure is described in Ryan, Marie-Laure. (1980). “Fiction, Non-Factuals, and the Principle of Minimal Departure.” *Poetics* 9: 403–22 (1980). We envisage something mentioned in a fiction text as similar to the real world unless otherwise stated.
- [11] Defoe p 216.
- [12] Defoe pp 76, 129–13. See also further explorations described on pp 129–131.
- [13] Olsen, M. *Farms and fanes of ancient Norway: the place-names of a country discussed in their bearings on social and religious history*. Oslo: Aschehoug. (1928) p 5.
- [14] Defoe p 158–162.
- [15] Defoe p 234.
- [16] Defoe, first used on pp 171 and 196 respectively.
- [17] Defoe pp 239–40.
- [18] Defoe pp 278–81.
- [19] Defoe p 66.
- [20] Defoe p 66.
- [21] Defoe pp 100–1.
- [22] Defoe p 167.
- [23] Defoe p 170..
- [24] Elleström, L. (2010). The Modalities of Media: A Model for Understanding Intermedial Relations. In L. Elleström (Ed.), *Media borders, multimodality and intermediality*, pp. 11–48. Basingstoke: Palgrave MacMillan.
- [25] Eide pp 158–60.
- [26] Wellbery, D. E. *Lessing's Laocoon. Semiotics and aesthetics in the age of reason*. Cambridge: Cambridge University Press (1984) pp 125–7.
- [27] MacEachren, A. M. *How maps work: representation, visualization, and design* (2nd ed.). New York: Guilford Press. (2004)
- [28] Woodward, D. and G. M. Lewis (1998). *Cartography in the traditional African, American, Arctic, Australian, and Pacific societies*. Chicago: University of Chicago Press. Volume 2.3 of *The History of Cartography*.
- [29] Brown, F. A. *Gotthold Ephraim Lessing*. New York: Twayne Publishers (1971) pp 72-4.
- [30] Defoe pp 168–70.
- [31] The book can be seen as three dimensional because each page has two dimensions, and the collection of pages making the book forms a third one.
- [32] Ishiguro, Kazuo. *The Unconsoled*. London: Faber and Faber (1995) pp 117–51.
- [33] Ishiguro pp 147–8.
- [34] Elleström, L. (2014) *Media Transformation: The Transfer of Media Characteristics among Media*. Houndsmill, Basingstoke, Hampshire: Palgrave Macmillan.
- [35] With thanks to the students who taught me so much: Nicky Agate, Olivia Albiero, Ashli Baker, Caitlin Christian-Lamb, Joanna Holliday, Verena Kick, Kristine Kotecki, Melissa McGregor, Sue McKee, Paul S. Moore, Rachel S. Philbrick, Theresa Quill, and Ellwood Wiggins.
- [36] The projects are documented at <http://textmappingasmodelling.wordpress.com/>

[37] <https://textmappingasmodelling.wordpress.com/2015/06/12/mapping-hemingways-the-killers/>

[38] On deformation, see for example McGann, J. J. *Radiant Textuality: Literature after the World Wide Web*. New York: Palgrave (2001).