Big Data and Grand Challenges.

Digital Humanities in between the Humanities and the Anthropocene

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Ever since I started at the university in Aarhus half a century ago the humanities have been declared in a crisis. I remember the turmoil of the 1960's, between the Classicists asking for the true scholarly edition of texts, and the Marxists asking for the representation of class in the texts, and the Poststructuralists, turning the question upside down asking with Stanley Fish (1982) whether at all there is a text in this class.

I believe it was Stuart Hall who first claimed that the humanities are always in a crisis (Hall 1990). In his case the crisis was articulated in the relative hostile response from within the humanities to the emergence of cultural studies and as he said, "most of us had to leave the humanities in order to do serious work in it".

For Stuart Hall, it was not simply a crisis *within* the humanities. It was also a crisis in the relation between the humanities and society at large:

"Cultural studies", he wrote, "originated in the debate regarding the nature of social change in the affluent, mass media culture of postwar Britain". A wider array of cultural artefacts and practices were now to be included in the humanities. Mainstream humanities were not prepared to deal with these cultural and social transformations and not prepared to direct contact with "the dirty outside world" (Hall 1990).

Those days are long gone, only the crisis remains, but today, I will argue, we are facing a different type of crisis, it is not as much about different notions of culture as it is a question whether and how we need to include any notion of culture in our notion of nature. But let me start elsewhere.

In his 'New History of the Humanities' Rens Bod opens the book claiming that "The humanities are under pressure all over the world…They suffer from a serious Image problem. They are seen as luxury 'pastime … of little use to society and even less to the economy". (Bod 2013: xii)

For Bod our mistake is that we often tend to legitimize the humanities only by referring to their importance for critical thinking, cultural consciousness, and historical responsibility and for creating competent, democratic citizens. These may be good values, but they do not respond to the serious image problem of the Humanities related to the lack of usefulness and not least to the lack of economic relevance.

But Bod also provides good news: What we do in the humanities is in fact much the same as they do in the sciences and social sciences, he says. We are looking for principles and patterns, and when looking back we can also document that the Humanities have dealt with concrete problems and resulted in applications in entirely unexpected fields and changed the world.

This is true. The first mechanical calculator for instance was built by Wilhelm Schickard, a German linguist in 1623 - okay, Schickard was actually also an astronomer.

Anyway, once upon a time our predecessors were useful and maybe had economic relevance and we can provide a long track record related to their contributions to the historical search for principles and patterns.

We study principles and patterns as in the sciences, but if so, why then do we demarcate ourselves as the humanities in opposition to the sciences?

Rens Bod has written a very important book and I welcome it very much. It's inspiring, and we don't have that many histories of the humanities. If I miss something, it is primarily the search for deviations, exceptions and unique phenomena.

But even if it is a very brilliant and important, I am still not convinced that the crisis of the humanities is primarily one of our own misunderstandings and self-underestimations in respect to usefulness and economical value. There are also good examples that we are useful in economic terms even today, but so far such examples haven't convinced those who need to be convinced – be it our colleagues in the social sciences and the sciences, or be it the broader public and the political world.

In the EU Horizon 2020 research program there is no separate domain for the humanities left, we are only there as an option and we have to make us self-indispensable to the sciences or social sciences. This is uphill, maybe. But even so this is where we have to go. This is bureaucracy some might say, but maybe it is not simply bureaucracy. Maybe we are in a society in which the nature of the humanities is under reconstruction if not dissolution.

Thus, I believe we need to ask more fundamentally if and why we still want to maintain a faculty of our own? How can we delimit ourselves if we just like everybody else in the sciences and social sciences is looking for principles and patterns as Bod suggest?

Looking back to Dilthey, Rens Bod argues that Diltheys delimitation of the humanities "as *the disciplines that investigate the expressions of human mind* is unsatisfactory since - for instance - Mathematics is to a large extent a product of the human mind, and yet it is not considered a humanistic discipline" (Bod: 2, Bods italics quoting Dilthey). One might add other strange cases as psychology. Should it be it counted a science, a social science or a discipline within the humanities? What about the distinction between the humanities and the social sciences?

And what about computer science, which almost exclusively deal with expressions of the human mind, why is it located within the faculty of sciences? What about contemporary technologies: biotechnologies, nanotechnologies, chemical technologies, all of it cultural products of the human mind.

The delimitations remain disturbingly flawed and inconsistent.

So much we can say: within the contemporary humanities we do not study all the expressions of the human mind.

My argument here is not, that we should simply include all these fields in the humanities, it's more the underlying implications: what does it mean within the various fields that we have excluded a wide range of expressions of the human mind from being exactly that?

I wonder if anything at all has changed since C.P. Snow (1959) – nearby 60 years ago - discussed the two cultures and criticized the humanities for its exclusiveness and ignorance towards the sciences.

Furthermore and maybe even more of a problem we do not today have 'the expressions of the human mind' as our own distinct, exclusive domain. New methods of scanning for instance provide new entrances to the study of the human brain and mind, and we cannot maintain the claim that the mind operates in its own pure medium (res cogitans) distinct from the neurophysiological processing in the brain and body (res extensa), nor can we ignore that the human mind increasingly expresses itself in a growing range of digital media which by the way always also store the traces of our mental activities performed with these media.

What we can observe in the world depends not simply on our isolated minds, but in the conjunction of our thoughts and our senses and their prolongations in a growing variety of media which gives us access to still more diverse, as well as fine grained, and also more far away processes in nature and culture. We are today dealing with nature in scales, below and beyond our own sensory capacities and which can only be accessed via externalized media, be it in nuclear physics, astronomy, bio tech, nano tech or info tech. These are the technologies of our age.

There are strong indications that we are in a transition from a paradigm of psycho-physical parallelism to a paradigm of psycho physical interactionism. As the res cogitans of Descartes is moved into his res extensa, their ongoing interactions, which were marginalized in the Cartesian paradigm, become immediately clear. Our mental activities take places in ongoing interactions with our bodies and our surroundings. As often argued and recently for instance by the Danish philosopher, Hans Fink (2006), there is only one nature and we should strive to conceptualize our notion of culture to be part of it.

We are not simply observers interacting with the world we are observers within nature. Culture cannot be but part of nature. It is not a clearly delimited niche, which does not interact with the environment. Culture is more like a particular natural resource, which is always blended into bio-geological and physical resources.

In this perspective the humanities is concerned with the study of human activity in nature, wherever or whenever it takes place. We may follow the spaceship to Mars or the media of observation that allow us to identify the Higgs particle or the scanning of outer space and inner body, searching early traces of the big bang, the origin of planetary systems or the origin and evolution of life, including our cultures and media. But we may also study those parts of nature in which we find the philosophy of Plato and Tao, the Chinese empire, the music of Beethoven, Beatles and Bob Dylan or those historical parts of nature, which has disappeared leaving only fragmented documentable traces in our minds and archives.

One might also specify a field of particular concern, namely that part of nature to which we give proper names as well as the capacity to give names, and the nature and culture of empathy.

The idea is not simply that we should follow the sciences and social sciences where ever they go – we should do that of course –the idea is also, that the human mind and its expressions are also a part of *their* fields as well. If a physical theory cannot allow or explain the existence of Beethovens symphonies it is not sufficiently sophisticated to be counted as a serious theory of nature.

Why would we change our minds on these issues? To some extent we might do so for philosophical reasons; to some extent due to particular experiences within

our different fields. Archeology for instance will maybe be more open for such a move than literary studies. I don't mind, but I think there is also a third, more general, but still historical reason related to the growing awareness that the influences of human activities in the bio and geosphere have grown rather dramatically during the last say 100 or 300 years.

Human activities are today to be counted as a distinct and strong force in the bio- and geosphere, not least due to expressions of the human mind. In a wider cosmological perspective this is maybe not that important, but in yours perspective, I suspect it to be of some importance.

And again also the wider cosmic perspective itself depends on the media of observation used, that is: culture.

Thus Culture is entangled in and part of nature, and we are constantly pushing the relations both by expanding our knowledge of this universe, but also in the reach of our physical and biological transactions, not least today because these transactions are heavily enforced by our mental activities.

This is, what has led to the recent debates on whether the notion of the Anthropocene should be declared a new geological epoch as suggested by the atmospheric chemist and Nobel laureate Paul Crutzen and others in 2000 and this is also – although only indirectly - what has led almost all the member states of the United Nations to specify a list of 17 goals to obtain sustainable development - ranging from issues of hunger, poverty, health, migration, provision of water and food, education, equal rights, not least empowering women and strengthen women's rights, building infrastructures, to deal with climate changes, ensuring sustainable economic growth and industries, sustainable ecosystems and so forth. (Un Sustainable Development Knowledge Platform, https://sustainabledevelopment.un.org/)

These are the grand challenges of humankind in a global perspective today - they need to be dealt with if we are to maintain culture, and they can only be dealt with if we are capable to incorporate different disciplinary perspectives in approaching these challenges.

Thus, as an example climate researchers to day strive to incorporate human behavioral data in their climate models to increase the insights in our impact on climate and series of related and complex issues (Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., Sörlin, S. (2015).

The grand challenges of UN Member States are not the only ones, but they tell that we live in globalized world. There is no national climate, and no national climate policy will make it, if it is not part of a global strategy. To deal with such grand challenges, we need to capture and collect data of many sorts in a global scale. They will have to be derived from multiple sources, some in real time, some in longer data series, and some being rather straightforward and standardized some being more complex and heterogeneous.

We also need to study national cultures, arts and value systems and what else in a global perspective. We need global knowledge systems. Scale is an issue; big data is an issue. They are not the only issues of course, and we have yet to develop our understanding of the variety of new knowledge formats developing. The notion 'big data' for instance is only a catch phrase to remind us that we have already entered a new epoch in the history of digitization of society and culture as well as of our relation to nature at large. And a crucial thing: Grand challenges most often

transcend the disciplinary structures, and need to be dealt with in trans-disciplinary collaborations and related to new types of research infrastructures.

Well. I have tried to sketch out a background perspective for a reconfiguration of the humanities, not as a separate faculty, but as an aspect in scholarship and scientific as well as educational affairs. If we cannot posit the humanities within some of these grand challenges, (or eventually some others we may come up with) in collaboration with other relevant stakeholders, there may not be much left.

I will now turn to the question how the digital humanities might provide one of the bridges from the humanities as it is, to what it might develop into. We may call it, our survival kit.

Let me start with – very briefly – to summarize how the humanities is actually already impacted by digitization and next turn to the question how the humanities may increase our understanding of these processes and the digital humanities may lead to new insights.

It is not always acknowledged, but Humanities is already touched by digitization in respect to both materials, methods, media, theories and institutionalization forms. A few words of each:

Materials. We are today confronted withy many new types of data both as they are produced in society at large and in research (not only digital reproductions of non-digital materials). Society and culture of today is increasingly performed on digital media platforms.

In recent years I have argued that we need to establish the study of digital materials as a new field to conceptualize and deal with the growing variety of digital materials and the growing variety of digital genres, like we formerly focused on printed texts and manuscripts. One intriguing thing among many is that electronic texts contrary to printed texts and manuscripts may also contain interactive features, scripts and links.

But digitization is not simply about new types of materials it is also about new *Methods* both in society and culture at large, in the public administration, in cultural production, arts, institutional practices etc. and also in research (distant reading, corpus linguistics and other large scale studies, network analyses, new analytical technics, social media studies and ways of knowledge visualization of say dynamic, multiple source knowledge systems, (Finnemann 2016). But not only materials and methods, also our
Media: we are confronted with new information and communication patterns and new cultural practices in all spheres of society as well as within growing parts of the humanities; new media platforms, genres and formats and again both in society at large and in research.

And finally there is of course also a range of theoretical issues:
Theories of e.g. text and materiality; theories of electronic text, hypertext, media theories, theories of genre, representation, visualization and narration in time and space, issues of identity and privacy, of changing balances between introvert an extrovert orientation) of incorporation and inscription, dynamic scripts (virtual reality systems, 3D print, distant reading, computer games), and of cultural encounters - including religious - in a global perspective. You have it. And I didn't even mention the projects on digitization of cultural heritage, even if it is also on

the global agenda and dealt with by UNESCO and others. To this comes also a range of institutional issues, which will take us to far today.

In short: There is no dimension in the humanities that is not impacted or touched upon.

This is often conceived of as a very deterministic approach to digitization. The idea is the opposite. Digitization is always a response to social and cultural needs. You just need to recall that Digitization it-self has a history which is basically a history of the development of still more diversified types of materials, of methods and of networked media to deal with a still growing range of issues. If the computer really were a deterministic machine we would today have only one big database including everything digital. But the world is too complex and the computer is too flexible.

If you would like to build a universal computing machine like Alan Turing's, you will have to build what he called 'a choice machine', which allow you to choose the next step if you so prefer. If you want to code the machine you will have to provide an alphabet in which the code is manifested. Thus we can always build new architectures and represent a multitude of paradigms, ideologies and value systems in this type of device. There are automats and sensors all around, there are robots some of which they call intelligent, and all these artefacts are significant expressions of the human mind, as are the texts produced by help of word processors, mail-programs, 3 D printers and virtual platforms like second life. etc.

Let me briefly summarize the three most important steps in the history of Digitization by focusing on the evolution of main paradigms. *First We have the idea* of the rule based machine to deal with well-ordered data sets: *Next we have the human computer interaction types of data* produced via word processors, spreadsheets and other applications, and *third we have data produced* in networked digital media ranging from social media data to highly professionalized multiple source knowledge systems some of which are globally synchronized and operating with a enforced response presence within milliseconds. We also have 3 D printing data, and we have 3D simulations whether fictions as in games and virtual communities like second life or in historical reconstructions of old cities and archaeological findings etc..

We have the whole range of cultural heritage in the form of digital copies of non-digital originals but we also increasingly have digital born data produced in all spheres of society representing a huge increase in the amounts, in the diversity of types and in the layered depth of data, and in the data architectures and in the functional architectures of the digital devices.

The computer is not simply about numbers, logic and automatization, this is part of it, but before that and after, it is about letters, - in the Latin alphabet, in the genetic alphabet, and in other alphabets as well, it is about images an visualizations, and always without any exception representation in the binary alphabet and presented via editable interfaces. The binary alphabet is the alphabet of our age. It's about inscriptions, before it is about encryption, it's about interactivity, incorporation and 'excorporation' and connectivity, it's about all sorts of processes and not simply mechanical and mathematical sequences or logic. It's also about interpretation - of texts, figures, images, statistics, and not least of computers. If the humanities have nothing to say about these issues, why listen? Again it is not the sole thing to speak about, but is a grand challenge for the humanities to come to grip with the 21th century.

Thus digitization is not simply a bridge for the humanities to study contemporary culture, which is increasingly articulated in digital media. It is also a bridge directly into the heart of this technology of inscription and performance. In this machine there is never inscription without performance and there is never performance without inscription.

There is no bridge to this century, which does not involve Digitization which again is primarily a product of the human mind.

So let's return to Dilthey, and make the expressions of the human mind our main concern, however without claiming it to a privileged domain for the humanities only.

Thank you for staying ☺

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