Visions, needs and requirements for (future) research environments: An exploration with ERC Grantee Poul Holm

Poul Holm (Trinity College Dublin), Bernd Saurugger (TU Wien)

Researchers are at the very heart of the EOSC: So what do researchers really need to do outstanding research, and produce high-impact research results? Moreover, how do they think could the EOSC support them in their research endeavours? Let's see what historian Poul Holm has to say.

"The beginning of a new Copernican Revolution"

TU Wien: What does your research currently focus on?

PH: My current focus is on the North Atlantic fishery history. I am looking at the early modern fish revolution, which happened as the grand banks of Newfoundland were discovered in the 15th century and how that took off and sustained food security in the European fish market in the next 200 years.

TU Wien: What are the things that drive your work and why?

PH: For the past 30 years, I have been looking at the impact of humans on the seas and how human societies depended on marine resources. I have done that in different contexts. But the main focus has really been to try and develop a long time series, which has made it possible to me to develop a very cross disciplinary collaboration between historians, archaeologists, biologists, oceanographers and climatologists, which is sort of bridging the gap between the humanities and natural sciences and also between narrative approaches and modelling approaches. The marine community is focused by training on getting strict protocols, experimental data according to a very tight schedule, whereas historical information tends to be messy. It is obviously derived from protocols, which depend on bureaucratic needs in different countries and cultures. In the early days, we were sort of met with a lot of suspicion and really basically the attitude was: "Your historical data is not relevant – forget about it!" So, we had to overcome that by employing a couple of data scientists who were able to work with us and develop protocols, so that we could make our information intelligible to the others, while not losing what we wanted to keep. That has been really a driver for me and I think I can say, I have been a pioneer in developing this type of research and had a huge opportunity for ten years to direct a global research initiative to look at this in 15 different regional teams across the globe.

TU Wien: What does it take to foster this interdisciplinary research in Europe and beyond?

PH: Most historians work in very small teams or as lone scholars. They typically write narrative books, whereas I have taken a very different approach. I think my formative experience was really this opportunity to direct the HMAP project (History of Marine Animal Populations) between 2000 and 2010. It was funded by an American foundation (the A.P.Sloan foundation), which quite uniquely has the approach of funding fundamental research with a long dedication of funding and with very low expectations of outputs in the formative years. Their philosophy is, that if you want to do something really innovative you should not be driven by expectations of deliverables. With that patience on the side of the funders, it was possible to train some PhD students to work with me and a few other people across the globe and develop this research project. That has been really formative for me. It dawned on me how difficult it is to establish a new research field, but also the huge gains that head from having patience. Patience and serendipity has been absolutely crucial and it would have been impossible in an

EOSCsecretariat.eu has received funding from the European Union's Horizon Programme call H2020-INFRAEOSC-2018-4, grant Agreement number 831644

European funding context, because there is no European funding that would allow this approach.

> "This is the promise of big data: That actually history has so much more to offer than it is usually suspected"

However, building data in a new field also needs planning. If you want to be able to build information on very incongruous datasets, you need to be very clear about your research question. And you need to be very clear about the protocols that you put in place, because otherwise you just have a messy lot of data that won't really tell you much – you just create a bigger fog of information. So, we have been trying to develop protocols as a big initiative. A lot of this is taking base on a voluntary basis in the past 20 years since that HMAP project began. We have developed what we call the Oceans Past Initiative, which is a scholarly community of historians, archaeologists and marine scientists across the globe.

TU Wien: What kind of research exactly are you currently unable to do because you lack this technology, time or knowledge?

PH: Let me give you a concrete example. I have worked for a very long time (literally 30 years) on the Danish Chancery records, which are sort of 16th and 17th century bureaucratic report letters from the Danish Royal Chancery to the governors of the country. These letters contain a huge amount of information about marine phenomena. We are looking at 15000 letters and it is full of information, anything from person names, place names, marine species, fishing technology, boats, information about prices and people and so on. You can imagine there is enormous amount of information in these letters. What I have done is, I have transcribed them, I have actually used my previous ERC grant to put a sub portion of this text base online, and this is just for the Danish Chancery records. Then, if you would think about the enormous amount of bureaucratic information that is available in the early modern age – the data is just phenomenal. There is so much out there. The beauty of it is that it is actually accessible. It is a simple question of scanning these published editions and doing either some intelligent mark-up or have some intelligent software to make this searchable and the gains from a scientific perspective will be phenomenal. One thing is of course that we could write better histories, and the other thing is that the current concern about our understanding of long-term climate change or long-term changes of biodiversity for example would be enormously influenced by having access to this kind of information, because it is there. It is not that it is undocumented, which most people think. Most people think that we don't know what happened before the age of modern statistics, which is completely wrong - it is a nonsense. We have this huge knowledge, just we don't have the key to unlock it. This is the promise of big data: That actually history has so much more to offer than it is usually suspected. Historians don't advocate this, because most of us were not trained to think in those terms.

TU Wien: How will research look like in 5 to 25 years and what would be the impact on infrastructures services or policies?

> "There is a huge need training a new type of people who are able to work in this cross-field"

PH: I think that in the humanities there will be two very different developments. I would say half of the humanities academic population is going the route of insisting on the lone scholar model writing books that take a strong narrative approach and it will sort of be indifferent to technological innovation. That is one pass, which will continue to be strong. The other one is clearly the pass I am going down, which is focusing on multidisciplinary collaboration at a very big scale. I think the opportunities are immense. It is happening really fast and I would say in the last five years it has really come off the ground. It is so

EOSCsecretariat.eu has received funding from the European Union's Horizon Programme call H2020-INFRAEOSC-2018-4, grant Agreement number 831644

obvious now. Even the big science journals like Science and Nature are regularly publishing studies, which depend on large-scale collaborative teamwork, involving both, natural scientists and humanists. That is a big change and we are only at the very beginning of this. I think that fundamentally we are at the beginning of a new Copernican Revolution. We are looking at this transformation from an analogue to a digital world, where we have so many more information possibilities that are opening up. I would say the humanities is one of the fields where this will have the biggest impact, because in many ways most science has gone at least through the early stages of quantification. In the humanities, it is only happening now. That will fundamentally change how we do our work and it will rapidly increase the applicability of our findings in a much broader context. So, that I think is the big change that is happening and it is happening so fast, that I would say even in five years' time, things will look massively different from what they are now and I can't even imagine how this will impact us 15 to 25 years into the future. The possibilities of big data are just staggering. I think the biggest challenge is that part of the humanities is still training our students and our researchers in ways that is simply not fit for purpose. There is a huge need training a new type of, maybe not humanities scholars, but human scientists (or whatever you would call them). People who are able to work in this cross field. That is a big challenge. The universities (or most of them) are not really up to it, but it is happening simply by people voting with their feet. It is happening in so many PhD grant applications, in graduate schools, but especially in big collaborative research teams, where you see people are really trained to address these challenges.

Poul Holm is Professor of Environmental History at Trinity College Dublin, Ireland. Poul is an internationally recognised pioneer in global marine environmental history. In the past two decades he has been at the forefront of developing new modes of inquiry into human exploitation of the sea and understanding the impact of human extractions for the marine environment. He directed the History of Marine Animal Populations project (2000-2010) with 15 teams and more than 100 researchers (historians, archaeologists, marine scientists) and established baselines for historical fisheries of main commercial species and in major habitats. In 2015, he was awarded an ERC AdG (NorFish) which has pioneered Big Data analytics, DeepChart Mapping, and historical ocean productivity modelling on the basis of multinational, multi-archival research. From 2021 he leads a new ERC Synergy project 4-OCEANS on the history of humans and marine life through the last two millennia. Poul is Chair of the Humanities Class, Academia Europaea.

EOSCsecretariat.eu has received funding from the European Union's Horizon Programme call H2020-INFRAEOSC-2018-4, grant Agreement number 831644