

## *Orders of Magnitude:*

### *Rethinking Size, Scale, and Mass in European Science and Politics, 1850-1950*

#### *Applicants*

<i>Supervisor Name</i>	<i>Discipline</i>
<i>Anne Heyer</i>	<i>Politics, Culture and National Identities, History</i>
<i>Johannes Müller</i>	<i>German Language and Culture/Literary Studies</i>

#### **Project description**

Why do whales get bigger than land mammals? Why is a hummingbird's heartbeat ten times as fast as an ostrich's and what are the metabolic limits of body size? Why do individuals behave differently in large groups? And how does group size affect democracy in mass societies? Questions of size and scale became urgent in the nineteenth and twentieth centuries. Scholars, politicians and citizens increasingly focused on the **crucial impact of scale and magnitude on biological, social, and economical processes** as well as on modern politics. The quest to identify generalizing mechanisms in the natural and the social world inspired interdisciplinary exchanges between scientists and political thinkers.

New insights in differences of scale often led to bleak visions of an anonymous and mechanized "mass society" that replaced human individuals with nihilistic brutes. However, thinking about scale also inspired new and innovative approaches to the challenges of modernity. This project seeks to understand the **emergence of new ideas about size and scale as the result of multi-disciplinary historical discourses** in which biology and sociology played a major role. Choosing scale as the shared category of investigation, we connect our expertise in the history of science, literary studies, sociology and political history to analyze how scale in the natural world co-inspired modern ideas of politics, economy, and democracy.

For this purpose, we analyze scholarly discourses about size and magnitude in biology and early sociology from an interdisciplinary perspective. The innovative strength of this project is that we use these historical scholarly texts to identify **previously unseen connections between the natural and social sciences** (project 1) and their **impact on political debates about democracy** (project 2).

### Research Trainee Profile

The trainees will be closely integrated into the research practice of the two applicants who have both considerable experience of studying historical sources, engaging with historical scholarly debates and working in an interdisciplinary setting. The applicants are also currently working on projects related to magnitude and scale in which they will involve the trainees. As a team we combine two methods:

- we closely analyze and compare the historical scholarly texts by biologists, sociologists, and political thinkers and examine the interactions between their theoretical approaches and ideas.
- we will embed these texts into their historical context through a biographical study of their authors and by situating them in more general social, political and scholarly debates of their time.

Each trainee will develop their own project in close cooperation with the team that will guide their specialized research and writing.

In the first phase the trainees will first familiarize themselves with the existing specialized literature about size and scale in the two sub-fields of the project: historical sociology and the history of science. In order to organize this scholarly literature phase, the trainees - with the help of researchers - will start in-depth reading of the central historical scholarly publications on the effects of scale and magnitude. For biology, this will be, for instance, Carl Bergmann's *On the thermal economy of animals in relation to their size* (1847), August Pütter's *Analogies of growth* (1920), JBS Haldane's *On being the right size* (1926), and excerpts from D'Arcy Wentworth Thompson's *On growth and form* (1942). For sociology, this will be, among others, Gustave Le Bon: *Psychologie des foules* (1895), Jean-Gabriel De Tarde '*Le Public et la Foule*' (1898) and Leopold Kohr's *Disunion now. A plea for a society based upon small autonomous units* (1941). The trainees will also identify additional historical scholarly works that focus on the question of scale. In addition, the trainees will start selecting secondary literature about these works.

In the second phase, the two trainees will develop their own specific research project and question. Special attention will be given to connections between the two sub-disciplines of the project biology and sociology (trainee 1) and the impact of these debates on social and political

debates (trainee 2). After this second phase, a blog entry or opinion piece will be co-written by the two trainees about the history of science of the concept of size and scale, for instance, for [historici.nl](http://historici.nl) or [HSozKult](http://HSozKult).

In the third phase, the trainees - together with the researchers - will organize a joint conference panel to present the results of the two sub-projects. The papers for the session will be used as the basis for two peer-reviewed publications of trainee and researcher of project 1 and 2 respectively.

Throughout the entire project, the trainees will gain valuable experience in all stages of research: literature study, source selection, analysis, writing and presentation of results to the general public and scholarly community. They also gain experience in interdisciplinary collaboration which provides further qualifications for a career in research or another sector. The team will meet regularly to discuss results and enable the identification of commonalities, differences and interactions between the two projects and the researchers' ongoing work on magnitude in their specific fields.

In order to successfully complete their projects, trainee 1 should preferably have a background in the history or philosophy of science. Applicants with a more cultural historical background are also welcome to apply if they have demonstrable interest in (the history of) biology or ecology. Reading knowledge of German is desirable. Trainee 2 should have reading knowledge of French (obligatory) and German (desirable) as well as a strong interest in the history of science and/or political history. Because of the theoretical and interdisciplinary groundings of the project, ideally we will recruit students at the Ma or ReMa level.

### **Collaboration (max. 300 words)**

Both researchers have considerable experience with interdisciplinary research. They are active participants not only of their own academic institutions, *Institute of History* and the *Leiden Centre for the Arts in Society*. They also successfully collaborated with other disciplines such as biology and political science. The project builds on these experiences and develops collaboration between the two researchers and with other disciplines in- and outside the humanities.

Anne Heyer is a political historian who teaches at the Institute for History and International Studies. She has written an interdisciplinary monograph *The Making of the Democratic Party, 1860-1880* (Palgrave). She is currently working on an interdisciplinary project on the effects of scale on political institutions with political scientists Honorata Mazepus and Wouter Veenendaal, founded by the LUF Snouck Hurgronje.

Johannes Müller is a cultural historian and teaches in the German and Literary Studies programmes at Leiden University. Among his research interests are environmental history as

well as the history of migration and knowledge transfer. He is currently working on a monograph on climate change and its impact on aquatic life with fisheries scientist Daniel Pauly.

Connecting the research interests in the history of science and politics of these two researchers, the project will contribute to positioning size and scale as a research theme in the history of science and political thought. In addition, this will provide a critical perspective on theories that are taken for granted in each sub-discipline. Because of the close connection of our research interests, we aim to continue our cooperation in the future and develop a closer collaboration between our institutions, for instance, with guest lectures in courses such as *Das Eigene und das Andere: Kulturen, Medien und Identität* and *Newspaper, Public Opinion and Mass Politics*.

### **Deliverables (max. 200 words)**

The team will present the project in the **research seminars** of *Environment, Ecologies and Extinctions* (LUCAS) and *Politics, Culture and National Identities* (Institute for History) to create further room for interdisciplinary collaboration between different institutes of the faculty of humanities in research and teaching. In addition, the two trainees will write a joint **opinion piece or blog** for *historici.nl* or *HSozKult*. The project will also form the basis for a **panel of a relevant conference**, for instance, the *Conceptual History Conference* or the annual conference of the *Dutch-Belgian Society for the History of Science*.

These two conference papers will result in **two peer-reviewed publications**, co-authored by applicants and trainees. The first paper (1) will trace debates about the role of size and scale in biology and the life sciences, starting with Carl Bergmann and its influence on later biological thinkers. The second paper (2) will focus on the concept of scale in early sociological literature and its impact on public debates in the emerging mass democracies of the late nineteenth century.

Finally, the primary sources and scholarly literature of the project will be used to **improve existing and develop new courses** at the Institute for History and LUCAS.

## Planning

February - March: orientation  
reading and analysis of relevant historiography,  
selection, reading and comparison of historical scholarly texts,  
contacting relevant people for conference panel

April - May: development of individual projects and research questions:  
project (1) interactions between biology and sociology,  
project (2): impact of scholarly debates on politics,  
writing of blog posts/opinion piece

June - August 2023: Analysis for individual projects,  
writing of conference papers: presentation at conference,  
rewriting papers for publication

## Student Application

*Provide information on how to apply e.g. required documents for application (resume, motivation letter etc.) and an email address where student applications should be sent to.*

Applicants should send a CV and motivation letter to the two project leaders Anne Heyer and Johannes Müller: [a.heyer@hum.leidenuniv.nl](mailto:a.heyer@hum.leidenuniv.nl) and [j.m.muller@hum.leidenuniv.nl](mailto:j.m.muller@hum.leidenuniv.nl).